

GEORGIA INSTITUTE OF TECHNOLOGY

Engineering Experiment Station

PROJECT INITIATION

Date: April 10, 1970

Project Title: **Statistical Analysis of Medical Data**

Project No.: **A-1242**

Project Director: **Mr. L. C. Young**

Sponsor: **National Aeronautics and Space Administration**

Effective **April 1, 1970** Estimated to run until: . . **March 31, 1971**

Type Agreement: **Contract No. NAS8-25703** Amount: \$ **No cost**

Reports: **Bimonthly letter reports**
Final report

Contact Person: **Mr. R. J. Whitcomb, ONR RR**
Administrative Contracting Officer
Georgia Institute of Technology

Assigned to . . . **Physical Sciences** Division

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GEORGIA INSTITUTE OF TECHNOLOGY
Engineering Experiment Station

PROJECT TERMINATION

Date 5/24/71

PROJECT TITLE: Statistical Analysis of Medical Data
PROJECT NO: A-1242
PROJECT DIRECTOR: L. C. Young
SPONSOR: National Aeronautics and Space Administration
TERMINATION EFFECTIVE: 4/30/71
CHARGES SHOULD CLEAR ACCOUNTING BY: N/A No charges to this account.

Contractual obligations remaining:

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GEORGIA INSTITUTE of TECHNOLOGY

Physical Sciences Division

825 North Avenue N.W.
Atlanta, Georgia 30332
(404) 873-4211 Ext. 220

June 1, 1970

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Attention: Mr. H. H. Katz, A&TS-MS-DIR

Subject: First Bi-Monthly Letter Progress Report
Contract No. NAS8-25703
Project: Statistical Analysis of Medical Data



Gentlemen:

A tape containing medical data was received from MSFC and logged into Georgia Tech in mid-April. Some troubles of parity and record length were experienced in attempting to read this tape, but these had been largely resolved by the first week in May. Work was then started upon probing the manner in which the information was distributed. (The 135-word or ten-card record length earlier found had implied that the ten cards of history per person were contained in each record, but this implication was found to be erroneous.) A tentative method of filing in personal units was prepared.

In mid-May we were advised that a second, more recent magnetic tape edition of the medical data was at hand: this was logged in on May 18. This tape has been put through the same procedures as the first, and the data are currently in process of being reassembled in groups keyed to the medical numbers, to allow for initial efforts at correlation.

Two items have contributed to a low rate of progress. The first was that the project director broke his knee-cap in an automobile accident on April 20 and has had low mobility since then. The second, which will continue,

is that the critical shortage of funds for computation makes it imperative that each computational step be tested and validated before being tried on the large number of data: this is particularly true where it is virtually impossible to visually edit the data by eye.

Respectfully submitted.

Louis C. Young/
Project Director, A-1242

LCY:emy



GEORGIA INSTITUTE of TECHNOLOGY

Physical Sciences Division

225 North Avenue N.W.
Atlanta, Georgia 30332
(404) 873-4811 Ext. 220

July 31, 1970

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Attention: Mr. H. H. Katz, A&TS-MS-DIR

Subject: Second Bi-Monthly Letter Progress Report
Contract No. NAS8-25703

Project: Statistical Analysis of Medical Data



Gentlemen:

An initial check of the card information available for each medical number disclosed that cards M01-M05 and M09 were present for the majority of medical numbers, but that M06-M08 were quite infrequent and M10 apparently not on the tape. Inasmuch as it is essential that the correlations be known quite accurately, between those physiological measurements which are to delineate the (oriented surface) limit of normal health, a large number of people must be represented. Hence, it is considered advisable, at least at this time, to limit consideration to those measurements which have been made and recorded in large number.

Data contained on the first five cards per person, of the magnetic tape received May 18, have now been assembled and keyed to the medical number. It has been found that birth date was recorded on only a small percentage of the M05 cards, so a program is now being executed to retrieve this information from the M09 card image, along with the patient's age as stand-by information.

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Work on regression, normalization, and correlation will proceed as soon as the linking-up of the data per person is completed.

Respectfully submitted,

Louis C. Young ✓
Project Director, A-1242

LCY:emy



GEORGIA INSTITUTE of TECHNOLOGY

Physical Sciences Division

225 North Avenue N.W.
Atlanta, Georgia 30332
(404) 873-4211 Ext. 220

September 30, 1970

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Attention: Mr. H. H. Katz, A&TS-MS-DIR

Subject: Third Bi-Monthly Letter Progress Report
Contract No. NAS8-25703
Project: Statistical Analysis of Medical Data



Gentlemen:

Medical observations available for a large number of people on cards M01 through M05 (as contrasted with scattered representation among the other cards) have been consolidated and given initial statistical consideration. Of the multi-valued variables recorded on those cards, twenty-four were represented for a sufficiently large percentage of individuals to promise statistical accuracy; these will form the main basis for determining the envelope of characteristics of a healthy group. One further variable has been added to these by summing the number of abnormalities (A versus N, 1 versus 0, etc., as pertinent) where these have been noted on those five cards: a total of fifty-three possible such abnormalities has been included in this count.

The total group, for which these twenty-five variables are generally available contains over twenty-one hundred persons. They have been divided somewhat arbitrarily into four groups: those under forty-five years of age and those over forty

five, for each sex. Although the total of all females is only slightly over two hundred and unlikely to support the final step in determining the tolerance envelope, there is no point in grouping it with the others to increase the degrees of freedom. Even if it were shown to be statistically not different from the others, there is every reason to believe that a difference (in medical observations) exists and that these data should be kept separate. Accumulation of future data, or of data from other sources, appears to be the best way to give increased statistical accuracy to any one of these groups having greater reason for uniformity within themselves than between themselves.

In the same way, --although more precise location of an age break would be warranted when individual aberrations have been eliminated,--different forms of dependence on age may be expected among younger men than among those who are older. Accordingly, within each of the four groups as mentioned, the dependence of each of the twenty-five variables upon age and height has been determined in the form of an equation

$$V_p = C + a_1 A + h_1 H + a_2 A^2 + h_2 H^2$$

Using the "step up" procedure, the validity of each successive regression constant has been examined, under least-squares-regression, from two standpoints: first, whether it is statistically significant and unlikely to have been caused by random sampling error; second, what percentage of the total variation of the variable can be reduced by employing this dependence. In Table I are listed the variables together with their card-column locations, and a tabulation indicating the relative significance of various coefficients. Only those are shown which

have a probability less than .05 of occurring by chance where no relationship truly exists; out of 400 coefficients, twenty such would of course be expected.

A two-fold criterion was therefore adopted that the coefficient should have less than .001 probability of appearing to be significant by error, and that its use should reduce the variance of the variable by more than two percent. Of the one hundred regressions among four groups of twenty-five variables, eleven met this condition. The appropriate regression equation for each of these has been used to adjust the original measurement for the effect of age and/or height within the group, although this adjustment is generally small.

Frequency distributions of the adjusted variables have been formed and viewed from the standpoint of the transformation to bring them into Gaussian form (so that the subsequent hyperellipsoidal envelope will be as nearly as possible an efficient, equiprobable tolerance). Two types of transformation were found initially adequate: the square root of the variable for variables number 2, 18, 19, 21, 23, and 25; and the logarithm of the variable for variables number 15, 16, and 17. The logarithmic transformation has also been tried on the variables 5 through 12 dealing with acuity, with such mixed results that a detailed discussion with Dr. W. B. Freirson will be necessary to determine in what way these variables may best be used in the final analysis.

Apart from this determination, two further computational steps remain to complete Phase I: determining the interdependence of the twenty-five adjusted and gaussianized variables upon each other, and using this and their off-diagonal covariance elements to determine the axes of the ellipsoidal envelope.

Respectfully submitted,

U U
Louis C. Young, Project Director

TABLE I

% VARIANCE REDUCTION POSSIBLE IN PHYSIOLOGICAL MEASURES,
for those regression dependences on age^A or height^H found to be significant. **

rd	Cols.	Measure	VNo.	FEMALE				MALE			
				under 45 years		over 45 years		under 45 years		over 45 years	
				a ₁	h ₁	a ₂	h ₂	a ₁	h ₁	a ₂	h ₂
	20-22	Weight	1	7*	18*				21*		19*
	26-28	Pulse	2	3			16*		1		
	31-33	B.P., sys	3	3		7				2*	1*
	34-36	B.P., dias	4	5				0			2*
	53-55	Acuity, RFU	5						1		
	56-58	RFC	6					1*		6*	
	59-61	RNU	7	12*	6	3	4	3*		2	
	62-64	RNC	8					4			
	65-67	LFU	9			10					
	68-70	LFC	10				20				
	71-73	LNU	11		7		7	4*		4*	
	74-76	LNC	12					4*		1	
	17-19	HGB	13	3						0	
	20-21	HCT	14	3						0	
	23-25	WBC	15					1	0		
	27-29	Glucose	16	3				3*			
	30-32	Cholesterol	17								
	33-35	Uric Acid	18		3		12	7			
	36-38	Sgpt	19					1			
	42-43	Bilirubin, d	20								31
	44-45	" , ind.	21			5					
	19-22	Spec. grow.	22			21		2			
	44-46	EKG rate	23					1*	1		
	47-50	axis	24	4			9	2*			1
		No. abnorms.	25	3			9			0	3*

** at $P \leq .05$. Underline denotes $P \leq .01$; * denotes $P \leq .001$

A-1242



ENGINEERING EXPERIMENT STATION

GEORGIA INSTITUTE of TECHNOLOGY

Physical Sciences Division

225 North Avenue N. W.
Atlanta, Georgia 30332
(404) 873-4211 Ext.5625

November 30, 1970

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Attention: Mr. H. K. Katz, A&TS-MS-DIR

Subject: Fourth Bi-Monthly Letter Progress Report
Contract No. NAS8-25703
Project: Statistical Analysis of Medical Data



Gentlemen:

The objectives of Phase I have now been achieved. The items specified in items A-1 and A-2 of the Statement of Work have been completed. In addition, coefficients have also been computed for specifying a hyperellipsoidal surface (of constant probability density), for the twenty-five variables listed in our last progress report, for each of four groups (men/women; under 45/over 45 years). These can be used directly for computing the value of chi-square, to test the presence of a significant multiplicity of insignificant abnormalities.

Reproductions of the correlation matrix, R , and of the inverse factor coefficient matrix, C , are included with this report for each group: the former matrix was employed to obtain the latter. In each case, the V refers to a transform of the original physical measurement variable as listed in our previous (third) report, so transformed as to have zero mean and unit standard

deviation and an approximately Gaussian distribution. Using the sum of the squares of the products of the variables and their corresponding coefficients for any one person, chi-square can be determined for twenty-five degrees of freedom, with associated probability that the person might yield that or greater value of chi-square if he or she is a normally healthy representative.

With Phase I now completed, it remains to be determined what further work based upon these data will be desirable and possible. In that connection, we are listing some things which might now be done, either to prove the utility of the prior work or to extend that of the basic data set.

1. Test the computed coefficients and the supporting data, both to determine how many extreme individuals are still contained within the groups and to ensure that the chi-square distribution is indeed a satisfactory description within the less extreme levels.
2. Devise a method of allowing variables to be omitted without invalidating the chi-square procedure of judging normality.
3. Using principal factor analysis, determine the relative importance of the several physical measurements currently recorded in effecting the total description of a healthy state.
4. Reviewing the medical histories of all individuals in the four groups, from the standpoint both of abnormal individual physical measurements and of an abnormally high value of chi-square, find out what percentage

of abnormal health would be diagnosed by each means, and the amount of overlap.

5. Using the pairs of medical histories which are available for a limited number of people, construct a similar health criterion for changes in physical condition.

We would appreciate your comments on the foregoing. Inasmuch as our contract specifies that the nature of any further work be decided at this phase, it appears desirable that we meet as soon as convenient to discover whether support may now be found for further work, and what direction the latter may best assume. We will look forward in the interim to coming over to discuss the matter, as soon as we receive word from you.

Respectfully submitted,


Louis C. Young
Project Director, A-1242

LCY:emy

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	1	1	.10000+01	2	1	1	-.53121-01	3	1	1	.30025+00	4	1	1	.27666+00	5	1	1	.88985-01
6	1	1	-.13374+00	7	1	1	.19741+00	8	1	1	-.17054+00	9	1	1	.88419-01	10	1	1	-.10232+00
11	1	1	.16989+00	12	1	1	-.17281+00	13	1	1	-.86348-01	14	1	1	-.92944-01	15	1	1	-.10167+00
16	1	1	-.13658+00	17	1	1	-.84279-01	18	1	1	-.41248-01	19	1	1	-.38942-01	20	1	1	.16019+00
21	1	1	-.44709-01	22	1	1	.21684+00	23	1	1	-.39599-01	24	1	1	-.14350+00	25	1	1	.86610-01
1	2	1	-.53121-01	2	2	1	.10000+01	3	2	1	-.17230-01	4	2	1	-.13685+00	5	2	1	-.92968-01
6	2	1	.10656+00	7	2	1	-.73993-01	8	2	1	.93196-01	9	2	1	-.10225+00	10	2	1	.10061+00
11	2	1	-.92765-01	12	2	1	.93434-01	13	2	1	-.62405-01	14	2	1	-.57674-01	15	2	1	-.49843-01
16	2	1	-.51679-01	17	2	1	-.79731-01	18	2	1	-.28184-01	19	2	1	-.12653-01	20	2	1	-.25980+00
21	2	1	.33684-01	22	2	1	.70074-01	23	2	1	.40109-03	24	2	1	.71775-01	25	2	1	.50500-02
1	3	1	.30025+00	2	3	1	-.17230-01	3	3	1	.10000+01	4	3	1	.83490+00	5	3	1	-.30467-01
6	3	1	.20338-01	7	3	1	.54418-02	8	3	1	-.79116-01	9	3	1	-.37833-01	10	3	1	.50762-01
11	3	1	.75549-01	12	3	1	-.85638-01	13	3	1	.51625-01	14	3	1	.61997-01	15	3	1	.31082-01
16	3	1	.18841-01	17	3	1	.84671-01	18	3	1	.69973-01	19	3	1	.43053-01	20	3	1	-.27927+00
21	3	1	-.82591-02	22	3	1	.11137+00	23	3	1	.16874+00	24	3	1	.72306-01	25	3	1	.75005-01
1	4	1	.27666+00	2	4	1	-.13685+00	3	4	1	.83490+00	4	4	1	.10000+01	5	4	1	.10709-03
6	4	1	-.18102-01	7	4	1	-.22453-01	8	4	1	-.72875-01	9	4	1	-.61657-02	10	4	1	.12148-01
11	4	1	.73927-01	12	4	1	-.77980-01	13	4	1	.11836+00	14	4	1	.12030+00	15	4	1	.57740-01
16	4	1	.24040-01	17	4	1	.11079+00	18	4	1	.80704-01	19	4	1	.16184-01	20	4	1	-.17939+00
21	4	1	-.50825-01	22	4	1	.26126-01	23	4	1	.14460+00	24	4	1	.59553-01	25	4	1	.91421-01
1	5	1	.88985-01	2	5	1	-.92968-01	3	5	1	-.30467-01	4	5	1	.10709-03	5	5	1	.10000+01
6	5	1	-.91627+00	7	5	1	.47973+00	8	5	1	-.64159+00	9	5	1	.98911+00	10	5	1	-.94390+00
11	5	1	.66669+00	12	5	1	-.64171+00	13	5	1	-.63734-01	14	5	1	-.75538-01	15	5	1	-.47326-01
16	5	1	-.68786-01	17	5	1	-.65929-01	18	5	1	-.87065-01	19	5	1	.98381-01	20	5	1	.14895+00
21	5	1	-.34265-01	22	5	1	.14349-01	23	5	1	-.66161-01	24	5	1	-.13981+00	25	5	1	.24357-01
1	6	1	-.13374+00	2	6	1	.10656+00	3	6	1	.20338-01	4	6	1	-.18102-01	5	6	1	-.91627+00
6	6	1	.10000+01	7	6	1	-.48710+00	8	6	1	.62772+00	9	6	1	-.92809+00	10	6	1	.96338+00
11	6	1	-.65684+00	12	6	1	.62826+00	13	6	1	.40270-01	14	6	1	.53797-01	15	6	1	.28135-01
16	6	1	.74144-01	17	6	1	.48332-01	18	6	1	.93370-01	19	6	1	-.52152-01	20	6	1	-.11855+00
21	6	1	.69088-01	22	6	1	-.33061-01	23	6	1	.47544-01	24	6	1	.12528+00	25	6	1	-.85814-01
1	7	1	.19741+00	2	7	1	-.73993-01	3	7	1	.54418-02	4	7	1	-.22453-01	5	7	1	.47973+00
6	7	1	-.48710+00	7	7	1	.10000+01	8	7	1	-.78344+00	9	7	1	.49527+00	10	7	1	-.52960+00
11	7	1	.80407+00	12	7	1	-.78238+00	13	7	1	-.15196+00	14	7	1	-.14591+00	15	7	1	-.92047-01
16	7	1	-.13607+00	17	7	1	-.13569+00	18	7	1	-.11491+00	19	7	1	-.57038-01	20	7	1	.86607-01
21	7	1	-.73449-01	22	7	1	.12621+00	23	7	1	-.76509-01	24	7	1	-.80576-01	25	7	1	.16866-01
1	8	1	-.17054+00	2	8	1	.93196-01	3	8	1	-.79116-01	4	8	1	-.72875-01	5	8	1	-.64159+00
6	8	1	.62772+00	7	8	1	-.78344+00	8	8	1	.10000+01	9	8	1	-.66353+00	10	8	1	.65642+00
11	8	1	-.97237+00	12	8	1	.99967+00	13	8	1	.14805+00	14	8	1	.14333+00	15	8	1	.10312+00
16	8	1	.13795+00	17	8	1	.14794+00	18	8	1	.15602+00	19	8	1	-.10376+00	20	8	1	-.10622+00
21	8	1	.39521-01	22	8	1	-.12472+00	23	8	1	.98106-01	24	8	1	.11224+00	25	8	1	-.12851-01
1	9	1	.88419-01	2	9	1	-.10225+00	3	9	1	-.37833-01	4	9	1	-.61657-02	5	9	1	.98911+00
6	9	1	-.92809+00	7	9	1	.49527+00	8	9	1	-.66353+00	9	9	1	.10000+01	10	9	1	-.95619+00
11	9	1	.69029+00	12	9	1	-.66379+00	13	9	1	-.79418-01	14	9	1	-.91653-01	15	9	1	-.61518-01
16	9	1	-.10909+00	17	9	1	-.89291-01	18	9	1	-.10889+00	19	9	1	.95069-01	20	9	1	.12110+00
21	9	1	-.51252-01	22	9	1	.26387-01	23	9	1	-.85584-01	24	9	1	-.14990+00	25	9	1	-.25276-02

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	
1	10	1	-.10232+00	2	10	1	.10061+00	3	10	1	.50762-01	4	10	1	.12148-01
6	10	1	.96338+00	7	10	1	-.52960+00	8	10	1	.65642+00	9	10	1	-.95619+00
11	10	1	-.60470+00	12	10	1	.65543+00	13	10	1	.72199-01	14	10	1	.83144-01
16	10	1	.99752-01	17	10	1	.74276-01	18	10	1	.12150+00	19	10	1	-.52692-01
21	10	1	.66545-01	22	10	1	-.26609-01	23	10	1	.68083-01	24	10	1	.14346+00
1	11	1	.16989+00	2	11	1	-.92765-01	3	11	1	.75549-01	4	11	1	.73927-01
6	11	1	-.65604+00	7	11	1	.80407+00	8	11	1	-.97237+00	9	11	1	.69029+00
11	11	1	.10000+01	12	11	1	-.97257+00	13	11	1	-.14051+00	14	11	1	-.13554+00
16	11	1	-.13186+00	17	11	1	-.13858+00	18	11	1	-.14552+00	19	11	1	.11880+00
21	11	1	-.20457-01	22	11	1	.10917+00	23	11	1	-.92022-01	24	11	1	-.96117-01
1	12	1	-.17281+00	2	12	1	.93434-01	3	12	1	-.85638-01	4	12	1	-.77980-01
6	12	1	.62820+00	7	12	1	-.78238+00	8	12	1	.99967+00	9	12	1	-.66379+00
11	12	1	-.97257+00	12	12	1	.10000+01	13	12	1	.14772+00	14	12	1	.14319+00
16	12	1	.13681+00	17	12	1	.14829+00	18	12	1	.15534+00	19	12	1	-.10326+00
21	12	1	.38905-01	22	12	1	-.12461+00	23	12	1	.97737-01	24	12	1	.11223+00
1	13	1	-.86348-01	2	13	1	-.62405-01	3	13	1	.51625-01	4	13	1	.11838+00
6	13	1	.40270-01	7	13	1	-.15196+00	8	13	1	.14805+00	9	13	1	-.79418-01
11	13	1	-.14051+00	12	13	1	.14772+00	13	13	1	.10000+01	14	13	1	.99327+00
16	13	1	.61661+00	17	13	1	.87171+00	18	13	1	.82894+00	19	13	1	.42762+00
21	13	1	.42291+00	22	13	1	-.27313+00	23	13	1	.83932+00	24	13	1	.42171+00
1	14	1	-.92944-01	2	14	1	-.57674-01	3	14	1	.61997-01	4	14	1	.12030+00
6	14	1	.53797-01	7	14	1	-.14591+00	8	14	1	.14333+00	9	14	1	-.91653-01
11	14	1	-.13554+00	12	14	1	.14319+00	13	14	1	.99327+00	14	14	1	.10000+01
16	14	1	.61273+00	17	14	1	.87572+00	18	14	1	.82932+00	19	14	1	.40644+00
21	14	1	.39024+00	22	14	1	-.27403+00	23	14	1	.84360+00	24	14	1	.42072+00
1	15	1	-.10167+00	2	15	1	-.49843-01	3	15	1	.31082-01	4	15	1	.57740-01
6	15	1	.28135-01	7	15	1	-.92047-01	8	15	1	.10312+00	9	15	1	-.61518-01
11	15	1	-.99186-01	12	15	1	.10310+00	13	15	1	.93838+00	14	15	1	.94416+00
16	15	1	.61661+00	17	15	1	.87553+00	18	15	1	.83824+00	19	15	1	.39293+00
21	15	1	.35200+00	22	15	1	-.23985+00	23	15	1	.85156+00	24	15	1	.38234+00
1	16	1	-.13658+00	2	16	1	-.51679-01	3	16	1	.18841-01	4	16	1	.24040-01
6	16	1	.74144-01	7	16	1	-.13687+00	8	16	1	.13795+00	9	16	1	-.10909+00
11	16	1	-.13186+00	12	16	1	.13681+00	13	16	1	.61661+00	14	16	1	.61273+00
16	16	1	.10000+01	17	16	1	.72162+00	18	16	1	.72098+00	19	16	1	.34563+00
21	16	1	.35794+00	22	16	1	-.12955+00	23	16	1	.55007+00	24	16	1	.24036+00
1	17	1	-.84279-01	2	17	1	-.79931-01	3	17	1	.84671-01	4	17	1	.11079+00
6	17	1	.48332-01	7	17	1	-.13569+00	8	17	1	.14794+00	9	17	1	-.89991-01
11	17	1	-.13858+00	12	17	1	.14829+00	13	17	1	.87171+00	14	17	1	.87572+00
16	17	1	.72162+00	17	17	1	.10000+01	18	17	1	.91995+00	19	17	1	.41471+00
21	17	1	.40698+00	22	17	1	-.20725+00	23	17	1	.75800+00	24	17	1	.35705+00
1	18	1	-.41248-01	2	18	1	-.28184-01	3	18	1	.69973-01	4	18	1	.80704-01
6	18	1	.93370-01	7	18	1	-.11491+00	8	18	1	.15602+00	9	18	1	-.10889+00
11	18	1	-.14552+00	12	18	1	.15534+00	13	18	1	.82894+00	14	18	1	.82932+00
16	18	1	.72098+00	17	18	1	.91995+00	18	18	1	.10000+01	19	18	1	.40582+00
21	18	1	.37509+00	22	18	1	-.12154+00	23	18	1	.73589+00	24	18	1	.27123+00
												5	10	1	-.94399+00
												10	10	1	.10000+01
												15	10	1	.50598-01
												20	10	1	-.12035+00
												25	10	1	-.54292-01
												5	11	1	.66669+00
												10	11	1	-.68470+00
												15	11	1	-.99186-01
												20	11	1	.10574+00
												25	11	1	.29841-01
												5	12	1	-.64171+00
												10	12	1	.65543+00
												15	12	1	.10310+00
												20	12	1	-.10622+00
												25	12	1	-.11757-01
												5	13	1	-.63734-01
												10	13	1	.72199-01
												15	13	1	.93838+00
												20	13	1	.52008-01
												25	13	1	.15831+00
												5	14	1	-.75538-01
												10	14	1	.83144-01
												15	14	1	.94416+00
												20	14	1	.39454-01
												25	14	1	.17438+00
												5	15	1	-.47326-01
												10	15	1	.50598-01
												15	15	1	.10000+01
												20	15	1	.55591-01
												25	15	1	.12377+00
												5	16	1	-.88780-01
												10	16	1	.99752-01
												15	16	1	.61661+00
												20	16	1	.39775-01
												25	16	1	.17282+00
												5	17	1	-.65929-01
												10	17	1	.74276-01
												15	17	1	.87553+00
												20	17	1	.12689-01
												25	17	1	.22932+00
												5	18	1	-.87065-01
												10	18	1	.12150+00
												15	18	1	.83824+00
												20	18	1	.22980-01
												25	18	1	.18100+00

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	
1	19	1	-.38942-01	2	19	1	-.12653-01	3	19	1	.43053-01	4	19	1	.16184-01
6	19	1	-.52152-01	7	19	1	-.57038-01	8	19	1	-.10376+00	9	19	1	.95069-01
11	19	1	.11880+00	12	19	1	-.10326+00	13	19	1	.42762+00	14	19	1	.40644+00
16	19	1	.34563+00	17	19	1	.41471+00	18	19	1	.40582+00	19	19	1	.10000+01
21	19	1	.54640+00	22	19	1	-.69700-01	23	19	1	.34798+00	24	19	1	.10674+00
1	20	1	.16019+00	2	20	1	-.25980+00	3	20	1	-.27927+00	4	20	1	-.17939+00
6	20	1	-.11855+00	7	20	1	.86607-01	8	20	1	-.10622+00	9	20	1	.12110+00
11	20	1	.10574+00	12	20	1	-.10622+00	13	20	1	.52008-01	14	20	1	.39454-01
16	20	1	.39775-01	17	20	1	.12669-01	18	20	1	.22980-01	19	20	1	-.63901-01
21	20	1	.77557-01	22	20	1	-.66910-01	23	20	1	.22804-01	24	20	1	-.17064+00
1	21	1	-.44709-01	2	21	1	.33684-01	3	21	1	-.82591-02	4	21	1	-.50825-01
6	21	1	.69088-01	7	21	1	-.73449-01	8	21	1	.39521-01	9	21	1	-.51252-01
11	21	1	-.20457-01	12	21	1	.38905-01	13	21	1	.42291+00	14	21	1	.39024+00
16	21	1	.35794+00	17	21	1	.40698+00	18	21	1	.37569+00	19	21	1	.54640+00
21	21	1	.10000+01	22	21	1	.12543+00	23	21	1	.31227+00	24	21	1	.60967+00
1	22	1	.21684+00	2	22	1	.70074-01	3	22	1	.11137+00	4	22	1	.26126-01
6	22	1	-.33061-01	7	22	1	.12621+00	8	22	1	-.12472+00	9	22	1	.26387-01
11	22	1	.10917+00	12	22	1	-.12461+00	13	22	1	-.27313+00	14	22	1	-.27403+00
16	22	1	-.12955+00	17	22	1	-.20725+00	18	22	1	-.12154+00	19	22	1	-.69700-01
21	22	1	.12543+00	22	22	1	.10000+01	23	22	1	-.21754+00	24	22	1	.10588+00
1	23	1	-.39599-01	2	23	1	.40109-03	3	23	1	.16874+00	4	23	1	.14460+00
6	23	1	.47544-01	7	23	1	-.76509-01	8	23	1	.98106-01	9	23	1	-.85584-01
11	23	1	-.92022-01	12	23	1	.97737-01	13	23	1	.83932+00	14	23	1	.84360+00
16	23	1	.55007+00	17	23	1	.75800+00	18	23	1	.73589+00	19	23	1	.34798+00
21	23	1	.31227+00	22	23	1	-.21754+00	23	23	1	.10000+01	24	23	1	.31963+00
1	24	1	-.14350+00	2	24	1	.71775-01	3	24	1	.72306-01	4	24	1	.59553-01
6	24	1	.12528+00	7	24	1	-.80576-01	8	24	1	.11224+00	9	24	1	-.14990+00
11	24	1	-.96117-01	12	24	1	.11223+00	13	24	1	.42171+00	14	24	1	.42072+00
16	24	1	.24036+00	17	24	1	.35705+00	18	24	1	.27123+00	19	24	1	.10674+00
21	24	1	.60967+00	22	24	1	.10588+00	23	24	1	.31963+00	24	24	1	.10000+01
1	25	1	.86610-01	2	25	1	.50500-02	3	25	1	.75005-01	4	25	1	.91421-01
6	25	1	-.85814-01	7	25	1	.16866-01	8	25	1	-.12851-01	9	25	1	-.25276-02
11	25	1	.29841-01	12	25	1	-.11757-01	13	25	1	.15831+00	14	25	1	.17438+00
16	25	1	.17282+00	17	25	1	.22932+00	18	25	1	.18100+00	19	25	1	.20123-01
21	25	1	.40551-01	22	25	1	-.23071+00	23	25	1	.15691+00	24	25	1	.89339-01
												5	19	1	.98381-01
												10	19	1	-.52692-01
												15	19	1	.39293+00
												20	19	1	-.63901-01
												25	19	1	.20123-01
												5	20	1	.14895+00
												10	20	1	-.12035+00
												15	20	1	.55591-01
												20	20	1	.10000+01
												25	20	1	.55106-01
												5	21	1	-.34265-01
												10	21	1	.66545-01
												15	21	1	.35260+00
												20	21	1	.77557-01
												25	21	1	.40551-01
												5	22	1	.14349-01
												10	22	1	-.26609-01
												15	22	1	-.23985+00
												20	22	1	-.66910-01
												25	22	1	-.23071+00
												5	23	1	-.66161-01
												10	23	1	.68083-01
												15	23	1	.85156+00
												20	23	1	.22804-01
												25	23	1	.15691+00
												5	24	1	-.13981+00
												10	24	1	.14346+00
												15	24	1	.38234+00
												20	24	1	-.17064+00
												25	24	1	.89339-01
												5	25	1	.24357-01
												10	25	1	-.54292-01
												15	25	1	.12377+00
												20	25	1	.55106-01
												25	25	1	.10000+01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS
1	1	1	-.19803+00	2	1	1	.43772-01	3	1	1	.45743-01	4	1	1	.53496-01	5	1	1	-.59113+00
6	1	1	.57582+00	7	1	1	-.56299+00	8	1	1	.64978+00	9	1	1	-.61373+00	10	1	1	.61141+00
11	1	1	-.64979+00	12	1	1	.64831+00	13	1	1	.76582+00	14	1	1	.76581+00	15	1	1	.73016+00
16	1	1	.61699+00	17	1	1	.75302+00	18	1	1	.73609+00	19	1	1	.30810+00	20	1	1	-.76895-01
21	1	1	.40775+00	22	1	1	-.22833+00	23	1	1	.67603+00	24	1	1	.42728+00	25	1	1	.13189+00
1	2	1	.87299-01	2	2	1	-.15067+00	3	2	1	.97153-01	4	2	1	.12962+00	5	2	1	.66819+00
6	2	1	-.66951+00	7	2	1	.49682+00	8	2	1	-.61934+00	9	2	1	.66407+00	10	2	1	-.66819+00
11	2	1	.64081+00	12	2	1	-.62124+00	13	2	1	.57375+00	14	2	1	.57374+00	15	2	1	.59064+00
16	2	1	.40884+00	17	2	1	.55780+00	18	2	1	.51995+00	19	2	1	.44083+00	20	2	1	.14896+00
21	2	1	.32141+00	22	2	1	-.94049-01	23	2	1	.53198+00	24	2	1	.19635+00	25	2	1	.18845+00
1	3	1	.48937+00	2	3	1	-.32168-01	3	3	1	.91375+00	4	3	1	.87179+00	5	3	1	-.14117+00
6	3	1	.11398+00	7	3	1	.69042-01	8	3	1	-.10706+00	9	3	1	-.14869+00	10	3	1	.15248+00
11	3	1	.97535-01	12	3	1	-.11248+00	13	3	1	-.14862-01	14	3	1	-.11544-01	15	3	1	-.48282-01
16	3	1	-.93800-01	17	3	1	-.69984-02	18	3	1	-.61008-02	19	3	1	-.10043-01	20	3	1	-.33899+00
21	3	1	-.59281-01	22	3	1	.22871+00	23	3	1	.79318-01	24	3	1	.75720-01	25	3	1	.88369-01
1	4	1	-.14784+00	2	4	1	.31435+00	3	4	1	-.62226-01	4	4	1	-.18217+00	5	4	1	-.84078-01
6	4	1	.12109+00	7	4	1	.12122+00	8	4	1	-.14066+00	9	4	1	-.68027-01	10	4	1	.89974-01
11	4	1	.14176+00	12	4	1	-.13756+00	13	4	1	-.71030-01	14	4	1	-.80089-01	15	4	1	-.85358-01
16	4	1	-.22078-01	17	4	1	-.63739-01	18	4	1	-.89936-01	19	4	1	.25634+00	20	4	1	-.28713+00
21	4	1	.65356+00	22	4	1	.50429+00	23	4	1	-.10633+00	24	4	1	.63446+00	25	4	1	-.27578+00
1	5	1	.36264+00	2	5	1	-.47273+00	3	5	1	-.14993+00	4	5	1	-.85894-01	5	5	1	-.26244+00
6	5	1	.25092+00	7	5	1	.29597+00	8	5	1	-.18648+00	9	5	1	-.25902+00	10	5	1	.25188+00
11	5	1	.16709+00	12	5	1	-.18581+00	13	5	1	.14049-02	14	5	1	-.35864-02	15	5	1	.11162-01
16	5	1	.92185-02	17	5	1	-.35695-02	18	5	1	.27341-01	19	5	1	-.11030+00	20	5	1	.63681+00
21	5	1	.18432+00	22	5	1	.96943-01	23	5	1	-.17178-01	24	5	1	.38182-01	25	5	1	.29017-01
1	6	1	-.24473+00	2	6	1	.37999+00	3	6	1	-.68713-01	4	6	1	-.12751+00	5	6	1	-.24506+00
6	6	1	.22892+00	7	6	1	.36850+00	8	6	1	-.27647+00	9	6	1	-.22155+00	10	6	1	.19590+00
11	6	1	.25517+00	12	6	1	-.26108+00	13	6	1	.27801-02	14	6	1	.34130-01	15	6	1	.47423-01
16	6	1	.37066-01	17	6	1	.14154-01	18	6	1	.32650-01	19	6	1	-.15805+00	20	6	1	-.27887+00
21	6	1	-.28516+00	22	6	1	-.28597+00	23	6	1	.10006+00	24	6	1	-.35658-01	25	6	1	.30314+00
1	7	1	.28675+00	2	7	1	.23421+00	3	7	1	-.21752-01	4	7	1	-.54510-01	5	7	1	.59802-01
6	7	1	-.12300+00	7	7	1	-.74746-01	8	7	1	.11056+00	9	7	1	.46997-01	10	7	1	-.92432-01
11	7	1	-.81538-01	12	7	1	.10975+00	13	7	1	-.57471-01	14	7	1	-.63020-01	15	7	1	-.11589+00
16	7	1	.99965-02	17	7	1	-.18455-01	18	7	1	-.63080-01	19	7	1	-.11810+00	20	7	1	.12180+00
21	7	1	.23647+00	22	7	1	-.89734-01	23	7	1	-.86112-01	24	7	1	.27831+00	25	7	1	.78183+00
1	8	1	-.39197+00	2	8	1	-.53150+00	3	8	1	.40371-01	4	8	1	.16820+00	5	8	1	.11430-01
6	8	1	-.30758-01	7	8	1	-.87151-03	8	8	1	-.63939-02	9	8	1	.17062-01	10	8	1	-.37091-01
11	8	1	.18253-01	12	8	1	-.56456-02	13	8	1	-.96348-02	14	8	1	-.79242-03	15	8	1	-.41030-01
16	8	1	-.45975-02	17	8	1	-.30644-01	18	8	1	-.15587+00	19	8	1	-.27121+00	20	8	1	-.14818+00
21	8	1	.62813-01	22	8	1	-.35725+00	23	8	1	-.71160-01	24	8	1	.44493+00	25	8	1	.37979-01
1	9	1	-.16420+00	2	9	1	-.17431+00	3	9	1	.55823-01	4	9	1	.62553-01	5	9	1	-.31050-01
6	9	1	.10365+00	7	9	1	-.13149+00	8	9	1	-.71940-01	9	9	1	-.38041-01	10	9	1	.96198-01
11	9	1	.76088-01	12	9	1	-.89801-01	13	9	1	-.11038+00	14	9	1	-.12416+00	15	9	1	-.16182+00
16	9	1	.14141+00	17	9	1	-.26891-01	18	9	1	-.39417-01	19	9	1	.64928+00	20	9	1	-.39583-01
21	9	1	.23886+00	22	9	1	-.25205+00	23	9	1	-.15591+00	24	9	1	-.30914+00	25	9	1	.21706+00

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS
1 10	1	-.65284-01	2 10	1	.37075+00	3 10	1	.15150+00	4 10	1	.16297+00	5 10	1	.24064-01
6 10	1	.27008-01	7 10	1	-.81864-01	8 10	1	-.29774-01	9 10	1	.21574-01	10 10	1	.21230-01
11 10	1	.31321-01	12 10	1	-.36812-01	13 10	1	.19157-01	14 10	1	.22001-01	15 10	1	.74234-02
16 10	1	-.46399-01	17 10	1	-.10934+00	18 10	1	-.13704+00	19 10	1	-.38076-01	20 10	1	.39847+00
21 10	1	.17060+00	22 10	1	-.38596+00	23 10	1	.60586-01	24 10	1	.53695-01	25 10	1	-.24804+00
1 11	1	.32208+00	2 11	1	-.68991-01	3 11	1	-.12187+00	4 11	1	-.11538+00	5 11	1	-.22319-01
6 11	1	.21252-02	7 11	1	.44141-01	8 11	1	.25842-01	9 11	1	-.14643-01	10 11	1	.21208-02
11 11	1	-.12898-01	12 11	1	.22256-01	13 11	1	.12029+00	14 11	1	.10934+00	15 11	1	.97796-01
16 11	1	-.49506+00	17 11	1	-.70275-01	18 11	1	-.93514-01	19 11	1	.22991+00	20 11	1	-.20438+00
21 11	1	-.12112-01	22 11	1	-.27897+00	23 11	1	.62977-01	24 11	1	.94107-01	25 11	1	-.68703-01
1 12	1	.31657+00	2 12	1	.12328-01	3 12	1	-.44214-01	4 12	1	-.61304-01	5 12	1	.15548-01
6 12	1	-.17138-02	7 12	1	.11493+00	8 12	1	.38043-01	9 12	1	.24530-01	10 12	1	-.93678-02
11 12	1	-.21597-01	12 12	1	.32771-01	13 12	1	-.82024-01	14 12	1	-.82634-01	15 12	1	-.68259-01
16 12	1	.36878+00	17 12	1	.26061-01	18 12	1	.77540-01	19 12	1	-.85911-01	20 12	1	-.19704+00
21 12	1	.77823-01	22 12	1	-.25305+00	23 12	1	-.11846+00	24 12	1	.78170-02	25 12	1	-.20194+00
1 13	1	-.49509-01	2 13	1	-.46300-01	3 13	1	.99235-01	4 13	1	-.78291-01	5 13	1	-.11534-01
6 13	1	-.39855-01	7 13	1	.23206+00	8 13	1	.95797-01	9 13	1	-.31595-02	10 13	1	-.40973-01
11 13	1	-.70354-01	12 13	1	.10789+00	13 13	1	-.75381-01	14 13	1	-.74493-01	15 13	1	-.44826-01
16 13	1	.17970-01	17 13	1	-.96725-01	18 13	1	-.68336-01	19 13	1	.14501-01	20 13	1	-.10033-01
21 13	1	.10681+00	22 13	1	-.56920-03	23 13	1	.33353+00	24 13	1	-.77128-01	25 13	1	.14825-01
1 14	1	-.92074-01	2 14	1	.36932-01	3 14	1	.20763-01	4 14	1	.82840-01	5 14	1	.22247-01
6 14	1	.17581-01	7 14	1	.25590+00	8 14	1	.88459-01	9 14	1	.35281-01	10 14	1	-.64324-02
11 14	1	-.60320-01	12 14	1	.96017-01	13 14	1	-.18051-01	14 14	1	-.13261-01	15 14	1	-.26857-01
16 14	1	-.17081+00	17 14	1	.12687+00	18 14	1	.22209+00	19 14	1	-.13929-01	20 14	1	.33466-01
21 14	1	.93577-01	22 14	1	-.31730-01	23 14	1	-.20037+00	24 14	1	-.55928-01	25 14	1	-.52725-02
1 15	1	-.77733-02	2 15	1	.13724-01	3 15	1	.47965-01	4 15	1	-.11402-01	5 15	1	-.14296-01
6 15	1	-.22051-01	7 15	1	.11956+00	8 15	1	.49914-01	9 15	1	-.94392-02	10 15	1	-.20780-01
11 15	1	-.34788-01	12 15	1	.56008-01	13 15	1	-.25746-02	14 15	1	-.59503-02	15 15	1	-.31094-02
16 15	1	.84062-01	17 15	1	-.41076-01	18 15	1	-.26851-01	19 15	1	.18315+00	20 15	1	.98764+01
21 15	1	-.22007+00	22 15	1	.42406-02	23 15	1	-.61979-01	24 15	1	.17814+00	25 15	1	-.81777-02
1 16	1	.93289-02	2 16	1	-.22345-01	3 16	1	.13292+00	4 16	1	-.15358+00	5 16	1	.53658-01
6 16	1	.56248-01	7 16	1	-.10494+00	8 16	1	-.29517-01	9 16	1	.47201-01	10 16	1	.42571-01
11 16	1	.26439-01	12 16	1	-.38594-01	13 16	1	-.11536+00	14 16	1	-.11694+00	15 16	1	-.63601-01
16 16	1	-.72022-01	17 16	1	.10821+00	18 16	1	.16271+00	19 16	1	.29861-02	20 16	1	.29890-01
21 16	1	-.57094-01	22 16	1	-.43642-01	23 16	1	.84323-01	24 16	1	.87161-01	25 16	1	-.18896-01
1 17	1	.13630-01	2 17	1	.20237-01	3 17	1	-.19973+00	4 17	1	.17886+00	5 17	1	.18324-01
6 17	1	.27446-01	7 17	1	-.75411-02	8 17	1	.95124-04	9 17	1	.23117-01	10 17	1	.13788-01
11 17	1	.19098-02	12 17	1	-.37876-02	13 17	1	-.46100-01	14 17	1	-.47528-01	15 17	1	-.11845+00
16 17	1	-.79489-02	17 17	1	.28622-01	18 17	1	.58609-01	19 17	1	.34801-01	20 17	1	.41995-02
21 17	1	-.38513-01	22 17	1	.21315-02	23 17	1	.12579+00	24 17	1	.50954-01	25 17	1	-.80535-02
1 18	1	.21067-02	2 18	1	-.12072-01	3 18	1	.87964-03	4 18	1	-.30391-03	5 18	1	.13471+00
6 18	1	.15964+00	7 18	1	.22566-01	8 18	1	.25830-01	9 18	1	.13653+00	10 18	1	.10091+00
11 18	1	-.32237-02	12 18	1	.39557-02	13 18	1	.35372-01	14 18	1	.35414-01	15 18	1	.33663-01
16 18	1	.21544-01	17 18	1	-.13666+00	18 18	1	.25296-01	19 18	1	-.11316-01	20 18	1	-.97935-02
21 18	1	-.44405-02	22 18	1	.14717-01	23 18	1	-.38063-02	24 18	1	.17574-02	25 18	1	.29782-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS
1 19	1	.11955-02	2 19	1	.25436-02	3 19	1	-.32378-01	4 19	1	.41586-01	5 19	1	-.13744-03
6 19	1	.70963-03	7 19	1	-.34482-02	8 19	1	.25295-02	9 19	1	.78893-03	10 19	1	-.19542-03
11 19	1	-.24911-02	12 19	1	.31118-02	13 19	1	-.10207+00	14 19	1	-.10250+00	15 19	1	.19906+00
16 19	1	-.22336-02	17 19	1	-.29377-02	18 19	1	-.31556-02	19 19	1	.97168-02	20 19	1	-.10182-02
21 19	1	.56416-02	22 19	1	-.25804-02	23 19	1	-.14111-02	24 19	1	.75277-02	25 19	1	.96999-02
1 20	1	.83859-02	2 20	1	.64700-02	3 20	1	.26563-03	4 20	1	-.39309-02	5 20	1	.45017-01
6 20	1	.58293-01	7 20	1	.30815-01	8 20	1	.15789-01	9 20	1	.46200-01	10 20	1	.37018-01
11 20	1	-.46360-02	12 20	1	.70863-02	13 20	1	-.40450-02	14 20	1	-.41570-02	15 20	1	-.28898-02
16 20	1	.22449-02	17 20	1	.16453+00	18 20	1	-.14813+00	19 20	1	.18786-02	20 20	1	.17562-02
21 20	1	-.72341-02	22 20	1	.94183-02	23 20	1	.77743-03	24 20	1	-.86816-02	25 20	1	-.14207-02
1 21	1	-.39009-03	2 21	1	.10853-03	3 21	1	-.74553-03	4 21	1	-.26974-03	5 21	1	-.71429-02
6 21	1	-.24028-02	7 21	1	-.77697-02	8 21	1	.10671+00	9 21	1	-.50475-02	10 21	1	-.19708-02
11 21	1	.11628+00	12 21	1	-.28703-02	13 21	1	.18848-03	14 21	1	.23266-03	15 21	1	.54091-03
16 21	1	-.24741-03	17 21	1	.16829-03	18 21	1	.12629-02	19 21	1	-.21911-02	20 21	1	.24838-03
21 21	1	-.16358-02	22 21	1	.20851-02	23 21	1	.26655-03	24 21	1	-.18658-02	25 21	1	-.17133-02
1 22	1	-.25669-02	2 22	1	.97550-03	3 22	1	-.32115-02	4 22	1	.96841-05	5 22	1	.79545-01
6 22	1	-.62659-01	7 22	1	.72867-02	8 22	1	.20226-02	9 22	1	-.64872-01	10 22	1	.79121-01
11 22	1	.69945-03	12 22	1	-.95013-03	13 22	1	-.52207-03	14 22	1	-.51571-03	15 22	1	-.29307-03
16 22	1	-.59283-03	17 22	1	-.51469-03	18 22	1	-.22703-04	19 22	1	.10976-04	20 22	1	-.17941-02
21 22	1	-.26521-03	22 22	1	-.81890-03	23 22	1	-.24148-03	24 22	1	.71766-03	25 22	1	-.16556-02
1 23	1	.14930-02	2 23	1	-.18979-03	3 23	1	.76361-03	4 23	1	.72901-03	5 23	1	.62643-01
6 23	1	.62284-01	7 23	1	-.82819-03	8 23	1	.42931-03	9 23	1	-.77609-01	10 23	1	-.77137-01
11 23	1	.21205-04	12 23	1	-.21624-04	13 23	1	.39649-04	14 23	1	.39649-04	15 23	1	.38928-04
16 23	1	.30410-04	17 23	1	.38488-04	18 23	1	.33341-04	19 23	1	.21116-04	20 23	1	.00000
21 23	1	.21611-04	22 23	1	-.10012-04	23 23	1	.35754-04	24 23	1	.14174-04	25 23	1	.90972-05
1 24	1	.00000	2 24	1	.00000	3 24	1	.00000	4 24	1	.00000	5 24	1	.00000
6 24	1	.00000	7 24	1	.00000	8 24	1	.00000	9 24	1	.00000	10 24	1	.00000
11 24	1	.00000	12 24	1	.00000	13 24	1	.00000	14 24	1	.00000	15 24	1	.00000
16 24	1	.00000	17 24	1	.00000	18 24	1	.00000	19 24	1	.00000	20 24	1	.00000
21 24	1	.00000	22 24	1	.00000	23 24	1	.00000	24 24	1	.00000	25 24	1	.00000
1 25	1	.00000	2 25	1	.00000	3 25	1	.00000	4 25	1	.00000	5 25	1	.00000
6 25	1	.00000	7 25	1	.00000	8 25	1	.00000	9 25	1	.00000	10 25	1	.00000
11 25	1	.00000	12 25	1	.00000	13 25	1	.00000	14 25	1	.00000	15 25	1	.00000
16 25	1	.00000	17 25	1	.00000	18 25	1	.00000	19 25	1	.00000	20 25	1	.00000
21 25	1	.00000	22 25	1	.00000	23 25	1	.00000	24 25	1	.00000	25 25	1	.00000

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	1	2	.10000+01	2	1	2	.43143-01	3	1	2	.11847+00	4	1	2	.16641+00	5	1	2	-.11187+00
6	1	2	.73045-01	7	1	2	.13499+00	8	1	2	-.18100+00	9	1	2	-.23102+00	10	1	2	.74803-01
11	1	2	.44243-01	12	1	2	-.20436+00	13	1	2	.18212+00	14	1	2	.18248+00	15	1	2	.16283+00
16	1	2	.12118+00	17	1	2	.88673-01	18	1	2	.73878-01	19	1	2	.19428+00	20	1	2	.48828-03
21	1	2	.76953-01	22	1	2	.15053+00	23	1	2	.92605-01	24	1	2	-.13469-02	25	1	2	.83531-01
1	2	2	.43143-01	2	2	2	.10000+01	3	2	2	.13937+00	4	2	2	.46881-02	5	2	2	-.54340-01
6	2	2	.80663-01	7	2	2	.12471+00	8	2	2	-.93930-01	9	2	2	-.63769-01	10	2	2	.81376-01
11	2	2	.13010+00	12	2	2	-.10207+00	13	2	2	.89625-02	14	2	2	.10701-01	15	2	2	.33637+00
16	2	2	-.56949-01	17	2	2	.93392-04	18	2	2	-.49003-01	19	2	2	-.17738+00	20	2	2	-.91553-04
21	2	2	-.14835+00	22	2	2	.22764-01	23	2	2	.79619-01	24	2	2	-.66187-01	25	2	2	.37401-01
1	3	2	.11847+00	2	3	2	.13937+00	3	3	2	.10000+01	4	3	2	.65413+00	5	3	2	-.25187-01
6	3	2	.63867-01	7	3	2	-.67741-01	8	3	2	.10184-01	9	3	2	-.12624-01	10	3	2	.63113-01
11	3	2	.42979-01	12	3	2	-.32267-01	13	3	2	.11634+00	14	3	2	.11024+00	15	3	2	.63227-01
16	3	2	-.67750-01	17	3	2	.12793+00	18	3	2	-.35834-01	19	3	2	.13011+00	20	3	2	.00000
21	3	2	.11989+00	22	3	2	.52564-01	23	3	2	.86731-01	24	3	2	.71669-01	25	3	2	.28464-01
1	4	2	.16641+00	2	4	2	.46881-02	3	4	2	.65413+00	4	4	2	.10000+01	5	4	2	-.22145-01
6	4	2	.44543-01	7	4	2	.33253-01	8	4	2	.55770-02	9	4	2	-.11593-01	10	4	2	.41688-01
11	4	2	.79827-01	12	4	2	-.28358-01	13	4	2	.17209+00	14	4	2	.16640+00	15	4	2	.58364-01
16	4	2	-.22427+00	17	4	2	.17894+00	18	4	2	-.32003-01	19	4	2	.32464-01	20	4	2	.00000
21	4	2	.11404+00	22	4	2	.47730-01	23	4	2	.12568+00	24	4	2	.16296+00	25	4	2	.14986+00
1	5	2	-.11187+00	2	5	2	-.54340-01	3	5	2	-.25187-01	4	5	2	-.22145-01	5	5	2	.10000+01
6	5	2	-.95849+00	7	5	2	.33912+00	8	5	2	-.36875+00	9	5	2	.95275+00	10	5	2	-.95858+00
11	5	2	.28216+00	12	5	2	-.35327+00	13	5	2	-.10083+00	14	5	2	-.10860+00	15	5	2	-.12337+00
16	5	2	-.11735+00	17	5	2	-.38012-01	18	5	2	-.11660+00	19	5	2	-.20005+00	20	5	2	-.19073-05
21	5	2	.79220-01	22	5	2	-.39217-01	23	5	2	-.26364-01	24	5	2	.69707-01	25	5	2	-.16152+00
1	6	2	.73045-01	2	6	2	.80663-01	3	6	2	.63867-01	4	6	2	.44543-01	5	6	2	-.95849+00
6	6	2	.10000+01	7	6	2	-.36921+00	8	6	2	.38494+00	9	6	2	-.93693+00	10	6	2	.99915+00
11	6	2	-.31195+00	12	6	2	.36499+00	13	6	2	.22305-01	14	6	2	.30271-01	15	6	2	.48314-01
16	6	2	.14447-01	17	6	2	.81217-01	18	6	2	.51652-01	19	6	2	.17630+00	20	6	2	-.57220-05
21	6	2	-.10675+00	22	6	2	.26729-01	23	6	2	-.43801-01	24	6	2	-.12131+00	25	6	2	.18041+00
1	7	2	.13499+00	2	7	2	.12471+00	3	7	2	-.67741-01	4	7	2	.33253-01	5	7	2	.33912+00
6	7	2	-.36921+00	7	7	2	.10000+01	8	7	2	-.81635+00	9	7	2	.30953+00	10	7	2	-.36921+00
11	7	2	.91494+00	12	7	2	-.80825+00	13	7	2	.11399-01	14	7	2	.52421-02	15	7	2	.41943-01
16	7	2	-.44421-01	17	7	2	-.11576-02	18	7	2	-.26496-01	19	7	2	-.24478+00	20	7	2	-.95367-05
21	7	2	.10223+00	22	7	2	.23081+00	23	7	2	.44415-01	24	7	2	.27344+00	25	7	2	-.38618-01
1	8	2	-.18100+00	2	8	2	-.93930-01	3	8	2	.10184-01	4	8	2	.55770-02	5	8	2	-.36875+00
6	8	2	.38494+00	7	8	2	-.81635+00	8	8	2	.10000+01	9	8	2	-.30303+00	10	8	2	.38506+00
11	8	2	-.78187+00	12	8	2	.99159+00	13	8	2	-.28570-02	14	8	2	.16023-02	15	8	2	-.45485-01
16	8	2	.72597-01	17	8	2	.21651-01	18	8	2	-.16223-01	19	8	2	.24650+00	20	8	2	-.13351-04
21	8	2	-.11344+00	22	8	2	-.26313+00	23	8	2	-.15366-02	24	8	2	-.25916+00	25	8	2	.46932-01
1	9	2	-.23102+00	2	9	2	-.63769-01	3	9	2	-.12624-01	4	9	2	-.11593-01	5	9	2	.95275+00
6	9	2	-.93693+00	7	9	2	.30953+00	8	9	2	-.30303+00	9	9	2	.10000+01	10	9	2	-.93702+00
11	9	2	.31313+00	12	9	2	-.28737+00	13	9	2	-.12443+00	14	9	2	-.13160+00	15	9	2	-.14580+00
16	9	2	-.14627+00	17	9	2	-.40794-01	18	9	2	-.13145+00	19	9	2	-.23074+00	20	9	2	-.10681-03
21	9	2	.42657-01	22	9	2	-.24998-01	23	9	2	-.45140-01	24	9	2	.56285-01	25	9	2	-.17897+00

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	
1	10	2	.74803-01	2	10	2	.81376-01	3	10	2	.63113-01	4	10	2	.41688-01
6	10	2	.99915+00	7	10	2	-.36921+00	8	10	2	.38506+00	9	10	2	-.93702+00
11	10	2	-.31194+00	12	10	2	.36508+00	13	10	2	.12884-01	14	10	2	.20976-01
16	10	2	.85662-02	17	10	2	.72231-01	18	10	2	.41569-01	19	10	2	.16363+00
21	10	2	-.11331+00	22	10	2	.29167-01	23	10	2	-.50663-01	24	10	2	-.12392+00
1	11	2	.44243-01	2	11	2	.13010+00	3	11	2	.42979-01	4	11	2	.79827-01
6	11	2	-.31195+00	7	11	2	.91494+00	8	11	2	-.78187+00	9	11	2	.31313+00
11	11	2	.10000+01	12	11	2	-.77585+00	13	11	2	.43532-01	14	11	2	.38819-01
16	11	2	-.32811-01	17	11	2	.43323-01	18	11	2	-.76926-02	19	11	2	-.21021+00
21	11	2	.11500+00	22	11	2	.18090+00	23	11	2	.81982-01	24	11	2	.28161+00
1	12	2	-.20436+00	2	12	2	-.10207+00	3	12	2	-.32267-01	4	12	2	-.28358-01
6	12	2	.30499+00	7	12	2	-.80825+00	8	12	2	.99159+00	9	12	2	-.28737+00
11	12	2	-.77585+00	12	12	2	.10000+01	13	12	2	-.60797-02	14	12	2	-.12131-02
16	12	2	.82904-01	17	12	2	.12840-01	18	12	2	-.16567-01	19	12	2	.23822+00
21	12	2	-.98104-01	22	12	2	-.27185+00	23	12	2	.10250-02	24	12	2	-.25892+00
1	13	2	.18212+00	2	13	2	.89625-02	3	13	2	.11634+00	4	13	2	.17209+00
6	13	2	.22305-01	7	13	2	.11399-01	8	13	2	-.28570-02	9	13	2	-.12443+00
11	13	2	.43532-01	12	13	2	-.60797-02	13	13	2	.10000+01	14	13	2	.99820+00
16	13	2	.55654+00	17	13	2	.83017+00	18	13	2	.89559+00	19	13	2	.47371+00
21	13	2	.54500+00	22	13	2	.20741-01	23	13	2	.95144+00	24	13	2	.52817+00
1	14	2	.18248+00	2	14	2	.10701-01	3	14	2	.11024+00	4	14	2	.16640+00
6	14	2	.30271-01	7	14	2	.52421-02	8	14	2	.16023-02	9	14	2	-.13160+00
11	14	2	.38819-01	12	14	2	-.12131-02	13	14	2	.99820+00	14	14	2	.10000+01
16	14	2	.50118+00	17	14	2	.82830+00	18	14	2	.89268+00	19	14	2	.46236+00
21	14	2	.52093+00	22	14	2	.13531-01	23	14	2	.95364+00	24	14	2	.52465+00
1	15	2	.16283+00	2	15	2	.33637+00	3	15	2	.63227-01	4	15	2	.58364-01
6	15	2	.48314-01	7	15	2	.41943-01	8	15	2	-.45485-01	9	15	2	-.14580+00
11	15	2	.71847-01	12	15	2	-.47594-01	13	15	2	.89588+00	14	15	2	.90296+00
16	15	2	.50780+00	17	15	2	.74090+00	18	15	2	.82725+00	19	15	2	.35367+00
21	15	2	.40072+00	22	15	2	.55512-01	23	15	2	.89054+00	24	15	2	.47596+00
1	16	2	.12118+00	2	16	2	-.56949-01	3	16	2	-.87750-01	4	16	2	-.22427+00
6	16	2	.14447-01	7	16	2	-.44421-01	8	16	2	.72597-01	9	16	2	-.14627+00
11	16	2	-.32811-01	12	16	2	.82904-01	13	16	2	.55654+00	14	16	2	.56118+00
16	16	2	.10000+01	17	16	2	.35303+00	18	16	2	.53487+00	19	16	2	.23451+00
21	16	2	.31650+00	22	16	2	-.15133-01	23	16	2	.55830+00	24	16	2	.30428+00
1	17	2	.88673-01	2	17	2	.93392-04	3	17	2	.12793+00	4	17	2	.17894+00
6	17	2	.81217-01	7	17	2	-.11576-02	8	17	2	.21651-01	9	17	2	-.40794-01
11	17	2	.43323-01	12	17	2	.12830-01	13	17	2	.83017+00	14	17	2	.82830+00
16	17	2	.35303+00	17	17	2	.10000+01	18	17	2	.77729+00	19	17	2	.38836+00
21	17	2	.51125+00	22	17	2	.55697-01	23	17	2	.80908+00	24	17	2	.44192+00
1	18	2	.73878-01	2	18	2	-.49003-01	3	18	2	-.35834-01	4	18	2	-.32003-01
6	18	2	.51652-01	7	18	2	-.26496-01	8	18	2	-.16223-01	9	18	2	-.13145+00
11	18	2	-.76926-02	12	18	2	-.16567-01	13	18	2	.89559+00	14	18	2	.89268+00
16	18	2	.53487+00	17	18	2	.77729+00	18	18	2	.10000+01	19	18	2	.45935+00
21	18	2	.54337+00	22	18	2	.16073+00	23	18	2	.84988+00	24	18	2	.47841+00
												5	10	2	-.95858+00
												10	10	2	.10000+01
												15	10	2	.40595-01
												20	10	2	-.11444-04
												25	10	2	.18287+00
												5	11	2	.28216+00
												10	11	2	-.31194+00
												15	11	2	.71847-01
												20	11	2	.28610-04
												25	11	2	.24356-02
												5	12	2	-.35327+00
												10	12	2	.36508+00
												15	12	2	-.47594-01
												20	12	2	-.76294-05
												25	12	2	.33965-01
												5	13	2	-.10083+00
												10	13	2	.12884-01
												15	13	2	.89588+00
												20	13	2	-.24414-03
												25	13	2	.82592-01
												5	14	2	-.10860+00
												10	14	2	.20976-01
												15	14	2	.90296+00
												20	14	2	-.61035-04
												25	14	2	.89749-01
												5	15	2	-.12337+00
												10	15	2	.40595-01
												15	15	2	.10000+01
												20	15	2	.15259-04
												25	15	2	.99007-01
												5	16	2	-.11735+00
												10	16	2	.85662-02
												15	16	2	.50780+00
												20	16	2	.76294-05
												25	16	2	.31812+00
												5	17	2	-.38012-01
												10	17	2	.72231-01
												15	17	2	.74090+00
												20	17	2	.38147-05
												25	17	2	.13275+00
												5	18	2	-.11660+00
												10	18	2	.41569-01
												15	18	2	.82725+00
												20	18	2	-.22888-04
												25	18	2	-.24179-01

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS					
1	19	2	.19428+00	2	19	2	-.17738+00	3	19	2	.13011+00	4	19	2	.32464-01	5	19	2	-.20005+00
6	19	2	.17630+00	7	19	2	-.24478+00	8	19	2	.24650+00	9	19	2	-.23074+00	10	19	2	.16363+00
11	19	2	-.21021+00	12	19	2	.23822+00	13	19	2	.47371+00	14	19	2	.46236+00	15	19	2	.35367+00
16	19	2	.23451+00	17	19	2	.38836+00	18	19	2	.45935+00	19	19	2	.10000+01	20	19	2	-.45776-04
21	19	2	.40938+00	22	19	2	.77779-02	23	19	2	.38278+00	24	19	2	.17094-01	25	19	2	-.57428-01
1	20	2	.48828-03	2	20	2	-.91553-04	3	20	2	.00000	4	20	2	.00000	5	20	2	-.19073-05
6	20	2	-.57220-05	7	20	2	-.95367-05	8	20	2	-.13351-04	9	20	2	-.10681-03	10	20	2	-.11444-04
11	20	2	.28610-04	12	20	2	-.76294-05	13	20	2	-.24414-03	14	20	2	-.61035-04	15	20	2	.15259-04
16	20	2	.76294-05	17	20	2	.38147-05	18	20	2	-.22888-04	19	20	2	-.45776-04	20	20	2	.10000+01
21	20	2	-.17166-04	22	20	2	.63477-02	23	20	2	.45776-04	24	20	2	-.18311-03	25	20	2	-.11444-04
1	21	2	.76953-01	2	21	2	-.14835+00	3	21	2	.11989+00	4	21	2	.11404+00	5	21	2	.79220-01
6	21	2	-.10675+00	7	21	2	.10223+00	8	21	2	-.11344+00	9	21	2	.42657-01	10	21	2	-.11331+00
11	21	2	.11560+00	12	21	2	-.98104-01	13	21	2	.54560+00	14	21	2	.52093+00	15	21	2	.40072+00
16	21	2	.31650+00	17	21	2	.51125+00	18	21	2	.54337+00	19	21	2	.40938+00	20	21	2	-.17166-04
21	21	2	.10000+01	22	21	2	.31548+00	23	21	2	.45006+00	24	21	2	.64730+00	25	21	2	-.12543-01
1	22	2	.15053+00	2	22	2	.22764-01	3	22	2	.52564-01	4	22	2	.47730-01	5	22	2	-.39217-01
6	22	2	.26729-01	7	22	2	.23681+00	8	22	2	-.26313+00	9	22	2	-.24998-01	10	22	2	.29167-01
11	22	2	.18090+00	12	22	2	-.27165+00	13	22	2	.20741-01	14	22	2	.13531-01	15	22	2	.55512-01
16	22	2	-.15133-01	17	22	2	.55697-01	18	22	2	.16073+00	19	22	2	.77779-02	20	22	2	.63477-02
21	22	2	.31548+00	22	22	2	.10000+01	23	22	2	-.23722-01	24	22	2	.28105+00	25	22	2	.47388-02
1	23	2	.92605-01	2	23	2	.79619-01	3	23	2	.86731-01	4	23	2	.12568+00	5	23	2	-.26364-01
6	23	2	-.43801-01	7	23	2	.44415-01	8	23	2	-.15366-02	9	23	2	-.45140-01	10	23	2	-.50663-01
11	23	2	.81982-01	12	23	2	.10250-02	13	23	2	.95144+00	14	23	2	.95364+00	15	23	2	.89054+00
16	23	2	.55830+00	17	23	2	.80908+00	18	23	2	.84988+00	19	23	2	.38278+00	20	23	2	.45776-04
21	23	2	.45006+00	22	23	2	-.23722-01	23	23	2	.10000+01	24	23	2	.48581+00	25	23	2	.15385+00
1	24	2	-.13469-02	2	24	2	-.66187-01	3	24	2	.71669-01	4	24	2	.16296+00	5	24	2	.69707-01
6	24	2	-.12131+00	7	24	2	.27344+00	8	24	2	-.25916+00	9	24	2	.56285-01	10	24	2	-.12392+00
11	24	2	.28161+00	12	24	2	-.25892+00	13	24	2	.52817+00	14	24	2	.52465+00	15	24	2	.47596+00
16	24	2	.30428+00	17	24	2	.44192+00	18	24	2	.47841+00	19	24	2	.17094-01	20	24	2	-.18311-03
21	24	2	.64730+00	22	24	2	.28105+00	23	24	2	.48581+00	24	24	2	.10000+01	25	24	2	.10863+00
1	25	2	.83531-01	2	25	2	.37401-01	3	25	2	.28464-01	4	25	2	.14986+00	5	25	2	-.16152+00
6	25	2	.18041+00	7	25	2	-.38618-01	8	25	2	.46932-01	9	25	2	-.17897+00	10	25	2	.18287+00
11	25	2	.24356-02	12	25	2	.33965-01	13	25	2	.82592-01	14	25	2	.89749-01	15	25	2	.99007-01
16	25	2	.31812+00	17	25	2	.13275+00	18	25	2	-.24179-01	19	25	2	-.57428-01	20	25	2	-.11444-04
21	25	2	-.12543-01	22	25	2	.47388-02	23	25	2	.15385+00	24	25	2	.10863+00	25	25	2	.10000+01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	1	2	.18970+00	6	1	2	.25665-01	3	1	2	.12323+00	4	1	2	.14697+00
6	1	2	.11649+00	7	1	2	.17622-03	8	1	2	.46697-02	9	1	2	-.20753+00
11	1	2	.37230-01	12	1	2	.94901-03	13	1	2	.97711+00	14	1	2	.97711+00
16	1	2	.59416+00	17	1	2	.85306+00	18	1	2	.90859+00	19	1	2	.51321+00
21	1	2	.62316+00	22	1	2	.12178+00	23	1	2	.92797+00	24	1	2	.58583+00
1	2	2	.18454-01	2	2	2	.34194-01	3	2	2	-.15969-01	4	2	2	.27658-01
6	2	2	-.82626+00	7	2	2	.77418+00	8	2	2	-.79287+00	9	2	2	.77296+00
11	2	2	.73711+00	12	2	2	-.77786+00	13	2	2	.52485-01	14	2	2	.44132-01
16	2	2	-.36802-01	17	2	2	.40310-01	18	2	2	.24663-01	19	2	2	-.26787+00
21	2	2	.20596+00	22	2	2	.18882+00	23	2	2	.98679-01	24	2	2	.33657+00
1	3	2	.30256+00	2	3	2	.28240+00	3	3	2	.16798+00	4	3	2	.19893+00
6	3	2	.51080+00	7	3	2	.49141+00	8	3	2	-.50441+00	9	3	2	-.53489+00
11	3	2	.49329+00	12	3	2	-.52748+00	13	3	2	-.74916-01	14	3	2	-.75354-01
16	3	2	-.13522+00	17	3	2	-.78195-01	18	3	2	-.10671+00	19	3	2	-.14909+00
21	3	2	-.46320-01	22	3	2	.37680+00	23	3	2	-.13000+00	24	3	2	.10583+00
1	4	2	.14438+00	2	4	2	.16487-01	3	4	2	.84250+00	4	4	2	.87689+00
6	4	2	-.62860-01	7	4	2	-.13170+00	8	4	2	.12752+00	9	4	2	.13163+00
11	4	2	-.70872-01	12	4	2	.91626-01	13	4	2	.25320-01	14	4	2	.24373-01
16	4	2	-.34374+00	17	4	2	.95848-01	18	4	2	-.18230+00	19	4	2	.10476+00
21	4	2	.97207-01	22	4	2	.37752-02	23	4	2	-.25401-01	24	4	2	.24328-01
1	5	2	.11642+00	2	5	2	-.70194+00	3	5	2	-.96419-01	4	5	2	-.31250-01
6	5	2	.26783-01	7	5	2	-.22008-01	8	5	2	-.33632-01	9	5	2	-.49466-01
11	5	2	-.81742-01	12	5	2	-.12032-01	13	5	2	-.49875-01	14	5	2	-.65763-01
16	5	2	-.52102-01	17	5	2	-.38965-01	18	5	2	.36284-01	19	5	2	.31050+00
21	5	2	.49633+00	22	5	2	.48286+00	23	5	2	-.25702+00	24	5	2	.24653+00
1	6	2	.52420-01	2	6	2	-.28162+00	3	6	2	.20243-01	4	6	2	.10294+00
6	6	2	-.57130-01	7	6	2	-.26756-01	8	6	2	.51585-01	9	6	2	.23679-01
11	6	2	-.85212-02	12	6	2	.53151-01	13	6	2	-.61969-01	14	6	2	-.67739-01
16	6	2	.48301+00	17	6	2	-.28795-01	18	6	2	-.15521+00	19	6	2	-.23539+00
21	6	2	.42400-01	22	6	2	.34188-01	23	6	2	-.55984-02	24	6	2	.19041+00
1	7	2	.80186+00	2	7	2	-.83197-01	3	7	2	-.28929-02	4	7	2	-.88553-01
6	7	2	-.10355+00	7	7	2	-.22541-02	8	7	2	-.89940-01	9	7	2	-.54882-01
11	7	2	-.75632-01	12	7	2	-.10262+00	13	7	2	.44390-01	14	7	2	.53895-01
16	7	2	.17205+00	17	7	2	-.64887-01	18	7	2	-.46816-01	19	7	2	.35638+00
21	7	2	-.13997+00	22	7	2	-.28601+00	23	7	2	-.80591-01	24	7	2	-.29584+00
1	8	2	.00000	2	8	2	.00000	3	8	2	.00000	4	8	2	.00000
6	8	2	.00000	7	8	2	.00000	8	8	2	.00000	9	8	2	.00000
11	8	2	.00000	12	8	2	.00000	13	8	2	.00000	14	8	2	.00000
16	8	2	.00000	17	8	2	.00000	18	8	2	.00000	19	8	2	.00000
21	8	2	.00000	22	8	2	.00000	23	8	2	.00000	24	8	2	.00000
1	9	2	.28445+00	2	9	2	.49718+00	3	9	2	.22925-01	4	9	2	-.11974+00
6	9	2	-.93385-01	7	9	2	-.16409+00	8	9	2	.98889-01	9	9	2	.54786-01
11	9	2	-.26721+00	12	9	2	.84148-01	13	9	2	-.58552-01	14	9	2	-.58439-01
16	9	2	.11679+00	17	9	2	-.11892+00	18	9	2	-.21322-01	19	9	2	-.13223+00
21	9	2	.12590+00	22	9	2	.55500+00	23	9	2	-.10893+00	24	9	2	.94401-01
												5	1	2	-.18094+00
												10	1	2	.10713+00
												15	1	2	.90063+00
												20	1	2	.00000
												25	1	2	.15062+00
												5	2	2	.80169+00
												10	2	2	-.82609+00
												15	2	2	.54523-01
												20	2	2	.00000
												25	2	2	-.13575+00
												5	3	2	-.50774+00
												10	3	2	.51088+00
												15	3	2	.23330-01
												20	3	2	.00000
												25	3	2	.19447+00
												5	4	2	.12520+00
												10	4	2	-.67367-01
												15	4	2	-.68507-01
												20	4	2	.00000
												25	4	2	.13106-01
												5	5	2	-.46162-01
												10	5	2	.31434-01
												15	5	2	-.28524+00
												20	5	2	.00000
												25	5	2	-.27714+00
												5	6	2	.29357-01
												10	6	2	-.38573-01
												15	6	2	-.14761+00
												20	6	2	.00000
												25	6	2	.81210+00
												5	7	2	.69429-01
												10	7	2	-.11133+00
												15	7	2	-.25209-01
												20	7	2	.00000
												25	7	2	.97866-02
												5	8	2	.00000
												10	8	2	.00000
												15	8	2	.00000
												20	8	2	.10000+01
												25	8	2	.00000
												5	9	2	.80776-01
												10	9	2	-.99596-01
												15	9	2	.15648+00
												20	9	2	.00000
												25	9	2	-.17091-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS	V	F	GR	COEFFICIENTS
1	10	2	-.23864+00	2	10	2	.15596+00	3	10	2	.34778+00	4	10	2	-.17550+00
6	10	2	-.21058-02	7	10	2	.28622-01	8	10	2	-.23499-01	9	10	2	-.18352-01
11	10	2	.13600+00	12	10	2	-.17283-01	13	10	2	-.56456-01	14	10	2	-.59784-01
16	10	2	.37606+00	17	10	2	-.17753+00	18	10	2	-.97141-01	19	10	2	.29681+00
21	10	2	.19710+00	22	10	2	-.11361+00	23	10	2	-.11971+00	24	10	2	-.14752-01
1	11	2	.17013+00	2	11	2	-.29014-01	3	11	2	.23945-01	4	11	2	.55039-01
6	11	2	.83297-02	7	11	2	.73032-02	8	11	2	.48528-01	9	11	2	-.84119-01
11	11	2	-.23493-01	12	11	2	.53980-01	13	11	2	.45099-01	14	11	2	.40474-01
16	11	2	.17026+00	17	11	2	-.11484+00	18	11	2	-.59734-01	19	11	2	-.39457+00
21	11	2	.73577-01	22	11	2	-.30387+00	23	11	2	-.69550-01	24	11	2	.36095+00
1	12	2	-.68956-01	2	12	2	-.23379+00	3	12	2	.27049+00	4	12	2	-.68448-01
6	12	2	-.69603-02	7	12	2	-.11835+00	8	12	2	-.12336+00	9	12	2	.53109-02
11	12	2	-.10363+00	12	12	2	-.13408+00	13	12	2	.49394-01	14	12	2	.59114-01
16	12	2	.19120+00	17	12	2	-.17461-01	18	12	2	.12605+00	19	12	2	-.16343+00
21	12	2	-.30387+00	22	12	2	.20179+00	23	12	2	.19283-01	24	12	2	-.11658+00
1	13	2	-.50065-01	2	13	2	.28812-01	3	13	2	.65477-01	4	13	2	-.14597+00
6	13	2	.19498-01	7	13	2	-.22437+00	8	13	2	-.21642+00	9	13	2	-.29619-01
11	13	2	-.23511+00	12	13	2	-.22613+00	13	13	2	-.21991-01	14	13	2	-.20235-01
16	13	2	-.16711+00	17	13	2	.73160-01	18	13	2	-.18038-01	19	13	2	.53265-01
21	13	2	.26331-01	22	13	2	-.15437+00	23	13	2	-.10078+00	24	13	2	.21907+00
1	14	2	.16864-01	2	14	2	-.24361-01	3	14	2	.84095-02	4	14	2	-.42139-01
6	14	2	-.24605-01	7	14	2	.51118-01	8	14	2	.90617-01	9	14	2	.20207-01
11	14	2	.77086-01	12	14	2	.83983-01	13	14	2	.36343-02	14	14	2	.11758-01
16	14	2	-.72383-01	17	14	2	-.13441+00	18	14	2	-.52364-01	19	14	2	.18914+00
21	14	2	-.27047+00	22	14	2	.49578-01	23	14	2	.28569-01	24	14	2	.29192+00
1	15	2	-.53747-01	2	15	2	.15446-01	3	15	2	-.75022-01	4	15	2	.15106+00
6	15	2	-.70055-01	7	15	2	-.49499-01	8	15	2	-.74754-01	9	15	2	-.81964-01
11	15	2	-.89869-01	12	15	2	-.71705-01	13	15	2	.15259-01	14	15	2	.12802-01
16	15	2	-.16798-01	17	15	2	-.35909+00	18	15	2	.14860+00	19	15	2	.29969-01
21	15	2	.53079-01	22	15	2	-.21431-01	23	15	2	.13537+00	24	15	2	-.26895-01
1	16	2	-.27485-01	2	16	2	.76067-01	3	16	2	-.94811-01	4	16	2	.15335+00
6	16	2	.16011-01	7	16	2	-.48170-02	8	16	2	-.41848-01	9	16	2	-.17715-02
11	16	2	-.35499-01	12	16	2	-.16959-01	13	16	2	-.79580-01	14	16	2	-.77803-01
16	16	2	.12908+00	17	16	2	.10052+00	18	16	2	.11083+00	19	16	2	.81832-01
21	16	2	-.88425-01	22	16	2	-.65481-02	23	16	2	-.61642-01	24	16	2	.63021-01
1	17	2	.57315-01	2	17	2	.33683-01	3	17	2	.92747-01	4	17	2	-.10118+00
6	17	2	.96617-02	7	17	2	.43022-03	8	17	2	.22823-01	9	17	2	-.31162-03
11	17	2	.16555-01	12	17	2	.10873-01	13	17	2	-.70254-01	14	17	2	-.71627-01
16	17	2	-.31202-01	17	17	2	.28725-01	18	17	2	.10207+00	19	17	2	-.15150-01
21	17	2	.12565-01	22	17	2	-.88407-02	23	17	2	.17647+00	24	17	2	.42682-01
1	18	2	.18759-01	2	18	2	-.17508-01	3	18	2	.50895-01	4	18	2	-.26585-01
6	18	2	-.12144-01	7	18	2	.31291-01	8	18	2	.43952-01	9	18	2	.11297-02
11	18	2	.45027-01	12	18	2	.37799-01	13	18	2	-.25404-01	14	18	2	-.25021-01
16	18	2	-.47370-01	17	18	2	-.23183-01	18	18	2	.19730+00	19	18	2	-.31412-01
21	18	2	.10901-01	22	18	2	-.32928-01	23	18	2	-.14093+00	24	18	2	-.50281-02
												5	10	2	-.39003-01
												10	10	2	.84107-02
												15	10	2	.94564-02
												20	10	2	.00000
												25	10	2	-.83086-01
												5	11	2	-.57832-01
												10	11	2	.89068-02
												15	11	2	-.84733-02
												20	11	2	.00000
												25	11	2	-.33186+00
												5	12	2	-.26350-01
												10	12	2	-.46325-03
												15	12	2	.40910-01
												20	12	2	.00000
												25	12	2	-.14644+00
												5	13	2	.53632-01
												10	13	2	.21734-01
												15	13	2	.52499-01
												20	13	2	.00000
												25	13	2	.12349+00
												5	14	2	-.19954-01
												10	14	2	-.26084-01
												15	14	2	.66513-01
												20	14	2	.00000
												25	14	2	.24322-01
												5	15	2	-.64109-01
												10	15	2	-.63951-01
												15	15	2	-.21998-01
												20	15	2	.00000
												25	15	2	.33118-01
												5	16	2	.40609-01
												10	16	2	.15855-01
												15	16	2	-.77921-01
												20	16	2	.00000
												25	16	2	-.50684-01
												5	17	2	.67919-02
												10	17	2	.76823-02
												15	17	2	-.17499+00
												20	17	2	.00000
												25	17	2	-.16572-03
												5	18	2	.32745-02
												10	18	2	-.85523-02
												15	18	2	.58545-01
												20	18	2	.00000
												25	18	2	.53286-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS
1	19	2 .32958-01	2	19	2 .48571-02	3	19	2 -.32061-01	4	19	2 .15284-01	5	19	2 -.46259-01
6	19	2 .37900-01	7	19	2 -.18670+00	8	19	2 -.26664-01	9	19	2 .10728+00	10	19	2 .12137-01
11	19	2 .15006+00	12	19	2 -.37245-02	13	19	2 -.25231-02	14	19	2 -.25327-02	15	19	2 .25261-02
16	19	2 .53825-02	17	19	2 -.18818-01	18	19	2 .11232-01	19	19	2 -.39241-02	20	19	2 .00000
21	19	2 .78857-02	22	19	2 .11888-02	23	19	2 .29479-04	24	19	2 .21479-02	25	19	2 -.62082-02
1	20	2 .13548-01	2	20	2 -.42743-01	3	20	2 .40874-03	4	20	2 .13601-01	5	20	2 .33342-02
6	20	2 .37033-02	7	20	2 .73895-03	8	20	2 -.28304-02	9	20	2 -.55665-02	10	20	2 .16375-02
11	20	2 -.32703-02	12	20	2 -.72426-03	13	20	2 -.88433-01	14	20	2 -.88457-01	15	20	2 .11551+00
16	20	2 .83576-02	17	20	2 .89990-02	18	20	2 -.10429-01	19	20	2 .46229-03	20	20	2 .00000
21	20	2 .17083-01	22	20	2 -.85359-02	23	20	2 .60581-01	24	20	2 -.44665-02	25	20	2 -.15554-01
1	21	2 .60042-02	2	21	2 .59769-03	3	21	2 .24646-02	4	21	2 -.48730-04	5	21	2 -.53408-01
6	21	2 .49754-01	7	21	2 .42590-01	8	21	2 -.91273-02	9	21	2 .94545-01	10	21	2 -.74833-02
11	21	2 -.47255-01	12	21	2 -.17866-02	13	21	2 -.46945-03	14	21	2 -.55773-03	15	21	2 .12532-02
16	21	2 .40508-02	17	21	2 -.94333-02	18	21	2 .61616-02	19	21	2 .36337-02	20	21	2 .00000
21	21	2 .39854-02	22	21	2 -.96594-02	23	21	2 .76301-03	24	21	2 .14816-02	25	21	2 .31721-02
1	22	2 .49036-02	2	22	2 -.54929-02	3	22	2 -.10010-02	4	22	2 .32207-03	5	22	2 .95408-01
6	22	2 .52351-01	7	22	2 .72949-02	8	22	2 -.63731-02	9	22	2 .21503-01	10	22	2 .64162-01
11	22	2 -.27486-02	12	22	2 .81441-02	13	22	2 .96794-02	14	22	2 .95649-02	15	22	2 .58131-02
16	22	2 .47485-02	17	22	2 -.38445-01	18	22	2 .61022-02	19	22	2 -.80961-03	20	22	2 .00000
21	22	2 .28802-02	22	22	2 .70936-05	23	22	2 .85442-02	24	22	2 -.13009-02	25	22	2 .46590-04
1	23	2 .00000	2	23	2 .00000	3	23	2 .00000	4	23	2 .00000	5	23	2 .00000
6	23	2 .00000	7	23	2 .00000	8	23	2 .00000	9	23	2 .00000	10	23	2 .00000
11	23	2 .00000	12	23	2 .00000	13	23	2 .00000	14	23	2 .00000	15	23	2 .00000
16	23	2 .00000	17	23	2 .00000	18	23	2 .00000	19	23	2 .00000	20	23	2 .00000
21	23	2 .00000	22	23	2 .00000	23	23	2 .00000	24	23	2 .00000	25	23	2 .00000
1	24	2 .00000	2	24	2 .00000	3	24	2 .00000	4	24	2 .00000	5	24	2 .00000
6	24	2 .00000	7	24	2 .00000	8	24	2 .00000	9	24	2 .00000	10	24	2 .00000
11	24	2 .00000	12	24	2 .00000	13	24	2 .00000	14	24	2 .00000	15	24	2 .00000
16	24	2 .00000	17	24	2 .00000	18	24	2 .00000	19	24	2 .00000	20	24	2 .00000
21	24	2 .00000	22	24	2 .00000	23	24	2 .00000	24	24	2 .00000	25	24	2 .00000
1	25	2 .00000	2	25	2 .00000	3	25	2 .00000	4	25	2 .00000	5	25	2 .00000
6	25	2 .00000	7	25	2 .00000	8	25	2 .00000	9	25	2 .00000	10	25	2 .00000
11	25	2 .00000	12	25	2 .00000	13	25	2 .00000	14	25	2 .00000	15	25	2 .00000
16	25	2 .00000	17	25	2 .00000	18	25	2 .00000	19	25	2 .00000	20	25	2 .00000
21	25	2 .00000	22	25	2 .00000	23	25	2 .00000	24	25	2 .00000	25	25	2 .00000

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	1	3	.10000+01	2	1	3	.18374-01	3	1	3	.16179+00	4	1	3	.21578+00	5	1	3	.31955-01
6	1	3	-.24845-01	7	1	3	.37464-01	8	1	3	-.54687-01	9	1	3	.35480-01	10	1	3	-.30914-01
11	1	3	.36027-01	12	1	3	-.56937-01	13	1	3	.47692-01	14	1	3	.44564-01	15	1	3	.62368-02
16	1	3	.43796-01	17	1	3	.52995-01	18	1	3	.69254-01	19	1	3	.11862+00	20	1	3	.68392-01
21	1	3	.17411-01	22	1	3	.11190-01	23	1	3	-.89135-02	24	1	3	-.61099-01	25	1	3	.59478-01
1	2	3	.18374-01	2	2	3	.10000+01	3	2	3	.24498+00	4	2	3	.17420+00	5	2	3	.44580-02
6	2	3	-.22727-01	7	2	3	-.19828-01	8	2	3	-.43872-01	9	2	3	.15346-01	10	2	3	-.30098-01
11	2	3	-.60898-02	12	2	3	-.32751-01	13	2	3	-.20533-01	14	2	3	-.16566-01	15	2	3	-.41082-01
16	2	3	.14869-01	17	2	3	-.58231-01	18	2	3	.28403-02	19	2	3	-.13151-01	20	2	3	-.13760-01
21	2	3	.18471+00	22	2	3	.46687-01	23	2	3	.16575-01	24	2	3	.18371+00	25	2	3	.14792-01
1	3	3	.16179+00	2	3	3	.24498+00	3	3	3	.10000+01	4	3	3	.72744+00	5	3	3	.45652-01
6	3	3	-.45536-01	7	3	3	.36362-01	8	3	3	-.66908-01	9	3	3	.47787-01	10	3	3	-.43813-01
11	3	3	.33417-01	12	3	3	-.67290-01	13	3	3	-.55442-02	14	3	3	.29949-02	15	3	3	-.53252-02
16	3	3	.63554-01	17	3	3	-.17340-01	18	3	3	-.49745-02	19	3	3	.29352-01	20	3	3	.24070-01
21	3	3	.83703-01	22	3	3	-.29179-01	23	3	3	.43087-01	24	3	3	.64576-01	25	3	3	.34461-01
1	4	3	.21578+00	2	4	3	.17420+00	3	4	3	.72744+00	4	4	3	.10000+01	5	4	3	.41978-01
6	4	3	-.42365-01	7	4	3	.31875-01	8	4	3	-.69969-01	9	4	3	.40261-01	10	4	3	-.38968-01
11	4	3	.23240-01	12	4	3	-.75054-01	13	4	3	.52955-01	14	4	3	.59392-01	15	4	3	.49695-02
16	4	3	.30763-01	17	4	3	.18547-01	18	4	3	.41205-01	19	4	3	.44480-01	20	4	3	.27396-01
21	4	3	.75481-01	22	4	3	-.83293-01	23	4	3	.62373-01	24	4	3	.58074-01	25	4	3	.38367-01
1	5	3	.31955-01	2	5	3	.44580-02	3	5	3	.45652-01	4	5	3	.41978-01	5	5	3	.10000+01
6	5	3	-.91191+00	7	5	3	.65621+00	8	5	3	-.57481+00	9	5	3	.97258+00	10	5	3	-.91929+00
11	5	3	.59305+00	12	5	3	-.60488+00	13	5	3	.34517-01	14	5	3	.39459-01	15	5	3	.21167-01
16	5	3	.51495-02	17	5	3	-.13144-01	18	5	3	.36089-01	19	5	3	.17186-01	20	5	3	-.40359-01
21	5	3	-.17997-01	22	5	3	.12528-01	23	5	3	.35174-01	24	5	3	-.17526-01	25	5	3	.43395-01
1	6	3	-.24845-01	2	6	3	-.22727-01	3	6	3	-.45536-01	4	6	3	-.42365-01	5	6	3	-.91191+00
6	6	3	.10000+01	7	6	3	-.58647+00	8	6	3	.62028+00	9	6	3	-.92856+00	10	6	3	.97877+00
11	6	3	-.55328+00	12	6	3	.64667+00	13	6	3	-.42408-01	14	6	3	-.46282-01	15	6	3	-.17639-01
16	6	3	-.81459-02	17	6	3	.13669-01	18	6	3	-.23938-01	19	6	3	-.17630-01	20	6	3	.42687-01
21	6	3	.49161-05	22	6	3	-.38314-02	23	6	3	-.52809-01	24	6	3	-.74550-02	25	6	3	-.53115-01
1	7	3	.37464-01	2	7	3	-.19828-01	3	7	3	.36362-01	4	7	3	.31875-01	5	7	3	.65621+00
6	7	3	-.58647+00	7	7	3	.10000+01	8	7	3	-.69491+00	9	7	3	.63091+00	10	7	3	-.59490+00
11	7	3	.96537+00	12	7	3	-.73076+00	13	7	3	.44894-01	14	7	3	.46531-01	15	7	3	.30747-01
16	7	3	-.95420-02	17	7	3	.46646-01	18	7	3	.31547-01	19	7	3	.10970-01	20	7	3	-.19990-02
21	7	3	.64057-02	22	7	3	-.13935-01	23	7	3	-.20846-02	24	7	3	-.16156-01	25	7	3	.21182-01
1	8	3	-.54687-01	2	8	3	-.43872-01	3	8	3	-.66908-01	4	8	3	-.69969-01	5	8	3	-.57481+00
6	8	3	.62028+00	7	8	3	-.69491+00	8	8	3	.10000+01	9	8	3	-.58940+00	10	8	3	.63477+00
11	8	3	-.66852+00	12	8	3	.97955+00	13	8	3	-.94507-02	14	8	3	-.11051-01	15	8	3	-.31441-01
16	8	3	-.16195-01	17	8	3	.10854-01	18	8	3	-.45557-01	19	8	3	-.55446-01	20	8	3	.23207-02
21	8	3	-.40014-02	22	8	3	-.16803-01	23	8	3	.23508-02	24	8	3	.42022-01	25	8	3	-.71271-01
1	9	3	.35480-01	2	9	3	.15346-01	3	9	3	.47787-01	4	9	3	.40261-01	5	9	3	.97258+00
6	9	3	-.92856+00	7	9	3	.63091+00	8	9	3	-.58940+00	9	9	3	.10000+01	10	9	3	-.93225+00
11	9	3	.60937+00	12	9	3	-.61434+00	13	9	3	.38090-01	14	9	3	.42607-01	15	9	3	.15560-01
16	9	3	.96646-02	17	9	3	-.70716-02	18	9	3	.28815-01	19	9	3	.91595-02	20	9	3	-.52465-01
21	9	3	-.15400-01	22	9	3	.18441-01	23	9	3	.30985-01	24	9	3	-.29845-02	25	9	3	.41848-01

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	10	3	-.30914-01	2	10	3	-.30098-01	3	10	3	-.43813-01	4	10	3	-.38968-01	5	10	3	-.91929+00
6	10	3	.97877+00	7	10	3	-.59490+00	8	10	3	.63477+00	9	10	3	-.93225+00	10	10	3	.10000+01
11	10	3	-.55993+00	12	10	3	.65405+00	13	10	3	-.44912-01	14	10	3	-.48315-01	15	10	3	-.19299-01
16	10	3	-.60272-02	17	10	3	.13540-01	18	10	3	-.25921-01	19	10	3	-.17228-01	20	10	3	.42071-01
21	10	3	-.40903-02	22	10	3	-.85509-02	23	10	3	-.50325-01	24	10	3	-.38550-02	25	10	3	-.54766-01
1	11	3	.36027-01	2	11	3	-.60898-02	3	11	3	.33417-01	4	11	3	.23240-01	5	11	3	.59305+00
6	11	3	-.55328+00	7	11	3	.96537+00	8	11	3	-.66852+00	9	11	3	.60937+00	10	11	3	-.55993+00
11	11	3	.10000+01	12	11	3	-.70360+00	13	11	3	.50644-01	14	11	3	.50913-01	15	11	3	.25537-01
16	11	3	-.91238-02	17	11	3	.63096-01	18	11	3	.26897-01	19	11	3	-.90413-02	20	11	3	-.12513-01
21	11	3	.81108-02	22	11	3	-.13424-01	23	11	3	-.43265-02	24	11	3	.64738-02	25	11	3	.10914-01
1	12	3	-.58937-01	2	12	3	-.32751-01	3	12	3	-.67290-01	4	12	3	-.75054-01	5	12	3	-.60488+00
6	12	3	.64667+00	7	12	3	-.73076+00	8	12	3	.97955+00	9	12	3	-.61434+00	10	12	3	.65405+00
11	12	3	-.70300+00	12	12	3	.10000+01	13	12	3	-.16315-01	14	12	3	-.18702-01	15	12	3	-.33221-01
16	12	3	-.14395-01	17	12	3	.20093-02	18	12	3	-.49775-01	19	12	3	-.54918-01	20	12	3	-.30903-03
21	12	3	.21559-02	22	12	3	.14505-02	23	12	3	-.33209-02	24	12	3	.42794-01	25	12	3	-.68640-01
1	13	3	.47692-01	2	13	3	-.20533-01	3	13	3	-.55442-02	4	13	3	.52955-01	5	13	3	.34517-01
6	13	3	-.42408-01	7	13	3	.44894-01	8	13	3	-.94507-02	9	13	3	.38090-01	10	13	3	-.44912-01
11	13	3	.50644-01	12	13	3	-.16315-01	13	13	3	.10000+01	14	13	3	.99497+00	15	13	3	.77052+00
16	13	3	.46002+00	17	13	3	.65798+00	18	13	3	.48784+00	19	13	3	.23848+00	20	13	3	.33944-01
21	13	3	.28927+00	22	13	3	-.14070+00	23	13	3	.61868+00	24	13	3	.19276+00	25	13	3	.70509-01
1	14	3	.44504-01	2	14	3	-.16566-01	3	14	3	.29949-02	4	14	3	.59392-01	5	14	3	.39459-01
6	14	3	-.46282-01	7	14	3	.46531-01	8	14	3	-.11051-01	9	14	3	.42607-01	10	14	3	-.48315-01
11	14	3	.50913-01	12	14	3	-.18702-01	13	14	3	.99497+00	14	14	3	.10000+01	15	14	3	.76693+00
16	14	3	.45730+00	17	14	3	.65204+00	18	14	3	.47967+00	19	14	3	.23287+00	20	14	3	.34548-01
21	14	3	.27643+00	22	14	3	-.14325+00	23	14	3	.61651+00	24	14	3	.19069+00	25	14	3	.73846-01
1	15	3	.62308-02	2	15	3	-.41082-01	3	15	3	-.53252-02	4	15	3	.49695-02	5	15	3	.21167-01
6	15	3	-.17639-01	7	15	3	.30747-01	8	15	3	-.31441-01	9	15	3	.15560-01	10	15	3	-.19299-01
11	15	3	.25637-01	12	15	3	-.33221-01	13	15	3	.77052+00	14	15	3	.76693+00	15	15	3	.10000+01
16	15	3	.39783+00	17	15	3	.54371+00	18	15	3	.40131+00	19	15	3	.20177+00	20	15	3	.43182-01
21	15	3	.20831+00	22	15	3	-.22848-01	23	15	3	.51120+00	24	15	3	.12945+00	25	15	3	.17271-01
1	16	3	.43796-01	2	16	3	.14869-01	3	16	3	.63554-01	4	16	3	.30763-01	5	16	3	.51495-02
6	16	3	-.81459-02	7	16	3	-.95420-02	8	16	3	-.16195-01	9	16	3	.96646-02	10	16	3	-.60272-02
11	16	3	-.91238-02	12	16	3	-.14395-01	13	16	3	.46002+00	14	16	3	.45730+00	15	16	3	.39783+00
16	16	3	.10000+01	17	16	3	.31388+00	18	16	3	.32357+00	19	16	3	.18026+00	20	16	3	.28709-01
21	16	3	.21559+00	22	16	3	-.64855-03	23	16	3	.27023+00	24	16	3	.12323+00	25	16	3	.21716-01
1	17	3	.52995-01	2	17	3	-.58231-01	3	17	3	-.17340-01	4	17	3	.18547-01	5	17	3	-.13144-01
6	17	3	.13669-01	7	17	3	.46646-01	8	17	3	.10854-01	9	17	3	-.70716-02	10	17	3	.13540-01
11	17	3	.63096-01	12	17	3	.20093-02	13	17	3	.65798+00	14	17	3	.65204+00	15	17	3	.54371+00
16	17	3	.31388+00	17	17	3	.10000+01	18	17	3	.39162+00	19	17	3	.18863+00	20	17	3	.55961-01
21	17	3	.26645+00	22	17	3	-.11558+00	23	17	3	.52585+00	24	17	3	.15831+00	25	17	3	-.11667-01
1	18	3	.69254-01	2	18	3	.28403-02	3	18	3	-.49745-02	4	18	3	.41205-01	5	18	3	.36089-01
6	18	3	-.23938-01	7	18	3	.31547-01	8	18	3	-.45557-01	9	18	3	.28815-01	10	18	3	-.25921-01
11	18	3	.26897-01	12	18	3	-.49775-01	13	18	3	.48784+00	14	18	3	.47967+00	15	18	3	.40131+00
16	18	3	.32357+00	17	18	3	.39162+00	18	18	3	.10000+01	19	18	3	.29701+00	20	18	3	.48939-01
21	18	3	.26658+00	22	18	3	.48946-01	23	18	3	.34262+00	24	18	3	.16486+00	25	18	3	.28390-01

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	
1	19	3	.11862+00	2	19	3	-.13151-01	3	19	3	.29352-01	4	19	3	.44480-01
6	19	3	-.17630-01	7	19	3	.10970-01	8	19	3	-.55446-01	9	19	3	.91595-02
11	19	3	-.90413-02	12	19	3	-.54918-01	13	19	3	.23848+00	14	19	3	.23287+00
16	19	3	.18026+00	17	19	3	.18863+00	18	19	3	.29701+00	19	19	3	.10000+01
21	19	3	.39606+00	22	19	3	.12836+00	23	19	3	.17229+00	24	19	3	.38126-01
1	20	3	.60392-01	2	20	3	-.13760-01	3	20	3	.24070-01	4	20	3	.27396-01
6	20	3	.42667-01	7	20	3	-.19990-02	8	20	3	.23207-02	9	20	3	-.52465-01
11	20	3	-.12513-01	12	20	3	-.30903-03	13	20	3	.33944-01	14	20	3	.34548-01
16	20	3	.28709-01	17	20	3	.55961-01	18	20	3	.48939-01	19	20	3	.19625+00
21	20	3	.15600+00	22	20	3	-.61672-01	23	20	3	.32899-01	24	20	3	-.18152+00
1	21	3	.17411-01	2	21	3	.18471+00	3	21	3	.83703-01	4	21	3	.75481-01
6	21	3	.49161-05	7	21	3	.64057-02	8	21	3	-.40014-02	9	21	3	-.15400-01
11	21	3	.81108-02	12	21	3	.21559-02	13	21	3	.28927+00	14	21	3	.27643+00
16	21	3	.21559+00	17	21	3	.26645+00	18	21	3	.26658+00	19	21	3	.39666+00
21	21	3	.10000+01	22	21	3	.22985+00	23	21	3	.19750+00	24	21	3	.53852+00
1	22	3	.11190-01	2	22	3	.46687-01	3	22	3	-.29179-01	4	22	3	-.83293-01
6	22	3	-.38314-02	7	22	3	-.13935-01	8	22	3	-.16803-01	9	22	3	.18441-01
11	22	3	-.13424-01	12	22	3	.14505-02	13	22	3	-.14070+00	14	22	3	-.14325+00
16	22	3	-.64855-03	17	22	3	-.11558+00	18	22	3	.48946-01	19	22	3	.12836+00
21	22	3	.22885+00	22	22	3	.10000+01	23	22	3	-.13326+00	24	22	3	.17148+00
1	23	3	-.89135-02	2	23	3	.16575-01	3	23	3	.43087-01	4	23	3	.62373-01
6	23	3	-.52809-01	7	23	3	-.20846-02	8	23	3	.23508-02	9	23	3	.30985-01
11	23	3	-.43205-02	12	23	3	-.33209-02	13	23	3	.61868+00	14	23	3	.61651+00
16	23	3	.27023+00	17	23	3	.52585+00	18	23	3	.34262+00	19	23	3	.17229+00
21	23	3	.19750+00	22	23	3	-.13326+00	23	23	3	.10000+01	24	23	3	.25129+00
1	24	3	-.61099-01	2	24	3	.18371+00	3	24	3	.64576-01	4	24	3	.58074-01
6	24	3	-.74550-02	7	24	3	-.16156-01	8	24	3	.42022-01	9	24	3	-.29845-02
11	24	3	.64738-02	12	24	3	.42794-01	13	24	3	.19276+00	14	24	3	.19069+00
16	24	3	.12323+00	17	24	3	.15831+00	18	24	3	.16486+00	19	24	3	.38126-01
21	24	3	.53852+00	22	24	3	.17148+00	23	24	3	.25129+00	24	24	3	.10000+01
1	25	3	.59478-01	2	25	3	.14792-01	3	25	3	.34461-01	4	25	3	.38367-01
6	25	3	-.53115-01	7	25	3	.21182-01	8	25	3	-.71271-01	9	25	3	.41848-01
11	25	3	-.10914-01	12	25	3	-.68640-01	13	25	3	.70509-01	14	25	3	.73846-01
16	25	3	.21716-01	17	25	3	-.11667-01	18	25	3	.28390-01	19	25	3	-.62102-02
21	25	3	.37560-01	22	25	3	-.97577-01	23	25	3	.71887-01	24	25	3	.20225-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	1	3	.65602-01	2	1	3	.29103-01	3	1	3	.83914-01	4	1	3	.85072-01
6	1	3	-.90061+00	7	1	3	.82934+00	8	1	3	-.81571+00	9	1	3	.90625+00
11	1	3	.79827+00	12	1	3	-.84172+00	13	1	3	.14282+00	14	1	3	.14282+00
16	1	3	.66080-01	17	1	3	.85244-01	18	1	3	.10771+00	19	1	3	.68847-01
21	1	3	.45247-01	22	1	3	-.31304-02	23	1	3	.99323-01	24	1	3	.17612-01
1	2	3	.64111-01	2	2	3	.18342-01	3	2	3	.44298-01	4	2	3	.82612-01
6	2	3	.97851-01	7	2	3	-.82526-01	8	2	3	.97983-01	9	2	3	-.10358+00
11	2	3	-.76721-01	12	2	3	.98010-01	13	2	3	.91128+00	14	2	3	.91128+00
16	2	3	.55600+00	17	2	3	.74398+00	18	2	3	.61111+00	19	2	3	.37129+00
21	2	3	.45898+00	22	2	3	-.66016-01	23	2	3	.70496+00	24	2	3	.32606+00
1	3	3	.31300+00	2	3	3	.50115+00	3	3	3	.81168+00	4	3	3	.78138+00
6	3	3	.28602-01	7	3	3	-.48587-01	8	3	3	-.37489-01	9	3	3	-.33250-01
11	3	3	-.49358-01	12	3	3	-.31157-01	13	3	3	-.12447+00	14	3	3	-.12447+00
16	3	3	.18227-01	17	3	3	-.12937+00	18	3	3	.39635-02	19	3	3	.16630+00
21	3	3	.36199+00	22	3	3	.14228+00	23	3	3	-.55365-01	24	3	3	.29411+00
1	4	3	-.22642+00	2	4	3	.15876+00	3	4	3	-.34180+00	4	4	3	-.39076+00
6	4	3	-.31700-01	7	4	3	-.24998-02	8	4	3	.72137-02	9	4	3	.24205-01
11	4	3	.13058-01	12	4	3	.22150-01	13	4	3	-.15198+00	14	4	3	-.15198+00
16	4	3	.49105-02	17	4	3	-.10304+00	18	4	3	.11262+00	19	4	3	.28320+00
21	4	3	.59380+00	22	4	3	.64167+00	23	4	3	-.10658+00	24	4	3	.57161+00
1	5	3	.34690+00	2	5	3	-.22482+00	3	5	3	-.80926-01	4	5	3	-.49579-01
6	5	3	.13442+00	7	5	3	.12996+00	8	5	3	-.17395+00	9	5	3	-.13467+00
11	5	3	.11632+00	12	5	3	-.16206+00	13	5	3	-.76574-01	14	5	3	-.76574-01
16	5	3	.33726-01	17	5	3	-.42164-02	18	5	3	.15966+00	19	5	3	.55643+00
21	5	3	.11429+00	22	5	3	.11704+00	23	5	3	-.18371+00	24	5	3	-.42257+00
1	6	3	-.15602+00	2	6	3	.91477-01	3	6	3	-.60927-02	4	6	3	-.11349-01
6	6	3	.33444+00	7	6	3	.38837+00	8	6	3	-.33012+00	9	6	3	-.33115+00
11	6	3	.42554+00	12	6	3	-.32577+00	13	6	3	.29320-02	14	6	3	.29320-02
16	6	3	-.54382-01	17	6	3	.93252-01	18	6	3	-.32066-01	19	6	3	-.20934+00
21	6	3	.30475-01	22	6	3	-.98767-01	23	6	3	-.16307-01	24	6	3	.17133+00
1	7	3	.32291-01	2	7	3	.93458-01	3	7	3	-.14692+00	4	7	3	-.13823+00
6	7	3	-.17298-01	7	7	3	-.70285-01	8	7	3	-.40835-01	9	7	3	-.94906-02
11	7	3	-.73292-01	12	7	3	-.40672-01	13	7	3	-.23800-01	14	7	3	-.23800-01
16	7	3	-.91629-01	17	7	3	-.83481-01	18	7	3	.87853-02	19	7	3	.11350+00
21	7	3	.16802+00	22	7	3	-.25498+00	23	7	3	.52535-01	24	7	3	.66929-01
1	8	3	-.53975+00	2	8	3	.33342+00	3	8	3	.24355-01	4	8	3	-.24905-01
6	8	3	-.47154-01	7	8	3	-.14943-03	8	8	3	.44830-01	9	8	3	.28904-01
11	8	3	-.30475-02	12	8	3	.37616-01	13	8	3	-.96562-03	14	8	3	-.96562-03
16	8	3	-.13909+00	17	8	3	.43941-01	18	8	3	-.16956+00	19	8	3	-.18078-01
21	8	3	.14336+00	22	8	3	-.35077+00	23	8	3	.12413+00	24	8	3	.14602-01
1	9	3	.22985+00	2	9	3	-.44044+00	3	9	3	-.16216-01	4	9	3	.10345+00
6	9	3	-.84455-02	7	9	3	.10773+00	8	9	3	.15162+00	9	9	3	.29515-01
11	9	3	.10844+00	12	9	3	.13191+00	13	9	3	-.15891-01	14	9	3	-.15891-01
16	9	3	-.51138+00	17	9	3	.20607+00	18	9	3	-.12972+00	19	9	3	-.92822-02
21	9	3	.18855+00	22	9	3	-.15041+00	23	9	3	.15820+00	24	9	3	.29710+00
												5	1	3	.90036+00
												10	1	3	-.90516+00
												15	1	3	.11384+00
												20	1	3	-.23533-01
												25	1	3	.71272-01
												5	2	3	-.10542+00
												10	2	3	.96707-01
												15	2	3	.79302+00
												20	2	3	.88605-01
												25	2	3	.59783-01
												5	3	3	-.35002-01
												10	3	3	.30599-01
												15	3	3	-.14878+00
												20	3	3	.62460-01
												25	3	3	.64545-01
												5	4	3	.24649-01
												10	4	3	-.34427-01
												15	4	3	-.10049+00
												20	4	3	-.87211-01
												25	4	3	-.14330+00
												5	5	3	-.11794+00
												10	5	3	.13526+00
												15	5	3	-.21892-01
												20	5	3	.65097+00
												25	5	3	-.14020+00
												5	6	3	-.32128+00
												10	6	3	.33559+00
												15	6	3	.49244-02
												20	6	3	-.15445+00
												25	6	3	.49885-01
												5	7	3	-.80595-02
												10	7	3	-.21888-01
												15	7	3	-.12409+00
												20	7	3	.15774+00
												25	7	3	.88663+00
												5	8	3	.32090-01
												10	8	3	-.42321-01
												15	8	3	-.26797-01
												20	8	3	.54665+00
												25	8	3	-.25707+00
												5	9	3	.31677-01
												10	9	3	-.11212-01
												15	9	3	-.98817-01
												20	9	3	.53722-01
												25	9	3	-.83931-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	10	3	-.56013+00	2	10	3	-.54832+00	3	10	3	.23546+00	4	10	3	.21964+00
6	10	3	-.67583-02	7	10	3	-.13889-01	8	10	3	-.45327-01	9	10	3	-.19816-01
11	10	3	-.43134-01	12	10	3	-.37180-01	13	10	3	-.40057-01	14	10	3	-.40057-01
16	10	3	.10544+00	17	10	3	-.10377+00	18	10	3	.81021-01	19	10	3	.14933+00
21	10	3	.35372-01	22	10	3	.84234-01	23	10	3	-.26830-01	24	10	3	-.65832-02
1	11	3	.13937+00	2	11	3	-.18903+00	3	11	3	.20441-03	4	11	3	-.44896-01
6	11	3	.18302-02	7	11	3	.96758-01	8	11	3	.12191+00	9	11	3	.33713-01
11	11	3	.10078+00	12	11	3	.10598+00	13	11	3	-.26260-01	14	11	3	-.26260-01
16	11	3	.56003+00	17	11	3	-.28549-01	18	11	3	-.18397+00	19	11	3	-.26480+00
21	11	3	.15749+00	22	11	3	-.16006+00	23	11	3	-.20141+00	24	11	3	.20539+00
1	12	3	-.13144-01	2	12	3	-.12672-01	3	12	3	.62360-01	4	12	3	.21506-01
6	12	3	.17706-01	7	12	3	.31123-01	8	12	3	.21109-01	9	12	3	.93730-04
11	12	3	.30134-01	12	12	3	.29031-01	13	12	3	.78095-01	14	12	3	.78095-01
16	12	3	-.12418+00	17	12	3	.53767-01	18	12	3	-.25455+00	19	12	3	-.34094+00
21	12	3	-.37244-01	22	12	3	.52688+00	23	12	3	.50461-01	24	12	3	-.87204-01
1	13	3	-.10169-01	2	13	3	-.53619-02	3	13	3	-.10458-01	4	13	3	.37445-01
6	13	3	-.57278-02	7	13	3	-.76570-02	8	13	3	.30338-01	9	13	3	.31734-01
11	13	3	.36417-02	12	13	3	.26659-01	13	13	3	-.70529-01	14	13	3	-.70529-01
16	13	3	-.73508-01	17	13	3	.43724-01	18	13	3	.64086+00	19	13	3	-.34739+00
21	13	3	-.68736-01	22	13	3	.26309-01	23	13	3	-.53863-01	24	13	3	.70944-01
1	14	3	-.10731+00	2	14	3	.12775+00	3	14	3	.50412-01	4	14	3	.12979-01
6	14	3	.57933-01	7	14	3	.27945+00	8	14	3	.33985+00	9	14	3	.69882-01
11	14	3	.29586+00	12	14	3	.31404+00	13	14	3	.52092-01	14	14	3	.52092-01
16	14	3	-.52125-01	17	14	3	.55777-01	18	14	3	.72939-01	19	14	3	.13914+00
21	14	3	.84925-02	22	14	3	.25580-01	23	14	3	-.22601+00	24	14	3	-.17255+00
1	15	3	.24775-02	2	15	3	.25129-01	3	15	3	.51394-01	4	15	3	-.58550-01
6	15	3	.39825-01	7	15	3	.10698+00	8	15	3	.79197-01	9	15	3	.39797-02
11	15	3	.10108+00	12	15	3	.74667-01	13	15	3	-.16091+00	14	15	3	-.16091+00
16	15	3	.18773+00	17	15	3	.82652-01	18	15	3	-.38369-02	19	15	3	.87565-01
21	15	3	-.17637+00	22	15	3	.11267+00	23	15	3	.50410+00	24	15	3	-.86563-02
1	16	3	-.58225-01	2	16	3	.18766-01	3	16	3	.30138-01	4	16	3	-.53058-02
6	16	3	-.31425-01	7	16	3	-.92443-01	8	16	3	-.59301-01	9	16	3	.97646-02
11	16	3	-.88100-01	12	16	3	-.57019-01	13	16	3	-.76694-01	14	16	3	-.76694-01
16	16	3	.47845-01	17	16	3	.55209+00	18	16	3	-.58110-01	19	16	3	-.34306-01
21	16	3	.11676+00	22	16	3	.39716-01	23	16	3	-.14171+00	24	16	3	-.15195+00
1	17	3	.29224-01	2	17	3	-.52417-02	3	17	3	.17017+00	4	17	3	-.17277+00
6	17	3	-.50967-02	7	17	3	.25813-02	8	17	3	.16584-01	9	17	3	.79133-02
11	17	3	.26680-02	12	17	3	.13971-01	13	17	3	-.20179+00	14	17	3	-.20179+00
16	17	3	-.12643-01	17	17	3	.64251-01	18	17	3	.39373-01	19	17	3	.45843-02
21	17	3	.20869-01	22	17	3	-.80050-01	23	17	3	.99075-03	24	17	3	.22730-01
1	18	3	.16964-01	2	18	3	-.25645-01	3	18	3	-.10559-01	4	18	3	-.39915-03
6	18	3	.88140-02	7	18	3	.15119-01	8	18	3	.77556-02	9	18	3	-.84422-03
11	18	3	.85608-02	12	18	3	.64382-02	13	18	3	-.17843-01	14	18	3	-.17843-01
16	18	3	.62873-03	17	18	3	-.12588+00	18	18	3	.33270-01	19	18	3	-.15579+00
21	18	3	.34780+00	22	18	3	-.26728-01	23	18	3	.15755+00	24	18	3	-.28215+00
												5	10	3	-.32858-02
												10	10	3	.10858-01
												15	10	3	.10868-01
												20	10	3	-.25500-01
												25	10	3	.14759+00
												5	11	3	.32371-01
												10	11	3	-.35390-02
												15	11	3	-.78444-01
												20	11	3	.20246+00
												25	11	3	-.14654-02
												5	12	3	.39225-02
												10	12	3	.12257-02
												15	12	3	.21337+00
												20	12	3	.30945+00
												25	12	3	.20277+00
												5	13	3	.18447-01
												10	13	3	-.24180-03
												15	13	3	-.12251+00
												20	13	3	.19440+00
												25	13	3	.53408-02
												5	14	3	.94056-01
												10	14	3	.48005-01
												15	14	3	.17391-02
												20	14	3	-.99538-01
												25	14	3	.11564+00
												5	15	3	.17677-01
												10	15	3	.25932-01
												15	15	3	-.21677+00
												20	15	3	.25989-01
												25	15	3	.31317-01
												5	16	3	-.97555-02
												10	16	3	-.34121-01
												15	16	3	-.17703+00
												20	16	3	-.78441-01
												25	16	3	.38952-01
												5	17	3	.86861-02
												10	17	3	-.48489-02
												15	17	3	.35755+00
												20	17	3	-.15185-01
												25	17	3	.19435-01
												5	18	3	.50166-03
												10	18	3	.16462-02
												15	18	3	-.80989-02
												20	18	3	-.10504+00
												25	18	3	-.34399-01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS
1 19	3	-.19841-01	2 19	3	.33654-01	3 19	3	-.30397+00	4 19	3	.30593+00	5 19	3	.97135-02
6 19	3	.12656-02	7 19	3	.15501-01	8 19	3	.16973-01	9 19	3	.19326-02	10 19	3	-.39033-02
11 19	3	.85653-02	12 19	3	.16866-01	13 19	3	-.11389+00	14 19	3	-.11389+00	15 19	3	.15627+00
16 19	3	.50090-01	17 19	3	.42708-01	18 19	3	-.96167-02	19 19	3	.93794-02	20 19	3	-.23375-02
21 19	3	-.30883-02	22 19	3	-.81366-02	23 19	3	.21324-01	24 19	3	.71620-03	25 19	3	.19225-01
1 20	3	-.82757-03	2 20	3	-.11685-02	3 20	3	-.36779-02	4 20	3	-.29334-02	5 20	3	.19561+00
6 20	3	.14477+00	7 20	3	.48518-02	8 20	3	-.44557-01	9 20	3	.12083+00	10 20	3	.17119+00
11 20	3	-.69856-01	12 20	3	-.19030-01	13 20	3	.15340-02	14 20	3	.15340-02	15 20	3	.21011-03
16 20	3	-.43264-02	17 20	3	.50479-02	18 20	3	-.93432-02	19 20	3	-.33885-02	20 20	3	.75898-03
21 20	3	.61081-02	22 20	3	-.61942-02	23 20	3	.98669-03	24 20	3	.91559-02	25 20	3	-.22676-02
1 21	3	.17882-02	2 21	3	.31193-02	3 21	3	.11961-02	4 21	3	-.26304-02	5 21	3	.78986-01
6 21	3	.23619-01	7 21	3	.10054+00	8 21	3	-.15545-01	9 21	3	-.12348+00	10 21	3	-.65767-01
11 21	3	-.93646-01	12 21	3	.22343-01	13 21	3	.94982-03	14 21	3	.94982-03	15 21	3	-.19019-02
16 21	3	-.67649-03	17 21	3	.28026-02	18 21	3	.34143-02	19 21	3	-.34869-02	20 21	3	-.17384-02
21 21	3	-.77507-03	22 21	3	-.77261-03	23 21	3	-.39898-02	24 21	3	.19592-02	25 21	3	-.11201-02
1 22	3	.75274-04	2 22	3	-.77929-03	3 22	3	.33979-03	4 22	3	.34441-03	5 22	3	-.13039-01
6 22	3	.15133-01	7 22	3	-.96722-02	8 22	3	-.98510-01	9 22	3	.14679-01	10 22	3	-.14875-01
11 22	3	.13938-01	12 22	3	.10300+00	13 22	3	-.35866-04	14 22	3	-.35866-04	15 22	3	-.10969-03
16 22	3	-.54797-04	17 22	3	.15327-03	18 22	3	-.11179-04	19 22	3	.53670-04	20 22	3	.61589-04
21 22	3	-.17924-04	22 22	3	-.23279-02	23 22	3	.17152-04	24 22	3	-.40934-04	25 22	3	.00000
1 23	3	-.16690-02	2 23	3	-.74674-03	3 23	3	.38769-03	4 23	3	.17832-03	5 23	3	-.40131-01
6 23	3	.86720-01	7 23	3	.16954-01	8 23	3	.13391-01	9 23	3	.52628-01	10 23	3	-.71412-01
11 23	3	-.19339-01	12 23	3	-.16957-01	13 23	3	.27788-03	14 23	3	.27788-03	15 23	3	.43235-03
16 23	3	-.53114-03	17 23	3	-.11945-02	18 23	3	.39136-03	19 23	3	.14636-02	20 23	3	-.81456-05
21 23	3	-.44215-03	22 23	3	-.75425-03	23 23	3	-.90068-03	24 23	3	.11280-02	25 23	3	-.50234-03
1 24	3	-.50533-03	2 24	3	-.17043-02	3 24	3	.53361-03	4 24	3	.66250-03	5 24	3	.46884-01
6 24	3	.39023-01	7 24	3	-.61921-01	8 24	3	.38930-02	9 24	3	-.38795-01	10 24	3	-.34608-01
11 24	3	.55671-01	12 24	3	-.81671-02	13 24	3	-.57110-04	14 24	3	-.57110-04	15 24	3	-.67888-04
16 24	3	.13672-03	17 24	3	-.25906-03	18 24	3	.78612-04	19 24	3	.29380-03	20 24	3	.40372-03
21 24	3	.13103-03	22 24	3	-.68295-03	23 24	3	.12984-03	24 24	3	-.20045-03	25 24	3	-.54144-03
1 25	3	.00000	2 25	3	.00000	3 25	3	.00000	4 25	3	.00000	5 25	3	.00000
6 25	3	.00000	7 25	3	.00000	8 25	3	.00000	9 25	3	.00000	10 25	3	.00000
11 25	3	.00000	12 25	3	.00000	13 25	3	.00000	14 25	3	.00000	15 25	3	.00000
16 25	3	.00000	17 25	3	.00000	18 25	3	.00000	19 25	3	.00000	20 25	3	.00000
21 25	3	.00000	22 25	3	.00000	23 25	3	.00000	24 25	3	.00000	25 25	3	.00000

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	1	4	.10000+01	2	1	4	-.56080-01	3	1	4	.16816+00	4	1	4	.19270+00	5	1	4	-.10441-01
6	1	4	.16613-01	7	1	4	.10471-01	8	1	4	.23627-01	9	1	4	-.12735-01	10	1	4	.39296-01
11	1	4	.19836-01	12	1	4	-.62693-02	13	1	4	-.24453-01	14	1	4	-.24957-01	15	1	4	-.35333-01
16	1	4	-.20143-01	17	1	4	-.16558-01	18	1	4	.78111-01	19	1	4	.11362+00	20	1	4	.30228-02
21	1	4	-.12877-01	22	1	4	.37983-01	23	1	4	-.39075-01	24	1	4	-.71243-01	25	1	4	.90134-01
1	2	4	-.56080-01	2	2	4	.10000+01	3	2	4	.21046-01	4	2	4	.32272-02	5	2	4	.30827-01
6	2	4	-.45986-01	7	2	4	.86404-02	8	2	4	-.24341-01	9	2	4	.31813-01	10	2	4	-.48554-01
11	2	4	.14327-01	12	2	4	-.22024-01	13	2	4	.22872-01	14	2	4	-.39525-02	15	2	4	.30363-02
16	2	4	.26506-01	17	2	4	-.50759-02	18	2	4	-.24490-01	19	2	4	-.89761-02	20	2	4	.36329-01
21	2	4	.87885-01	22	2	4	-.17723-01	23	2	4	.58056-01	24	2	4	.11820+00	25	2	4	.41854-01
1	3	4	.16816+00	2	3	4	.21046-01	3	3	4	.10000+01	4	3	4	.73547+00	5	3	4	.10750-01
6	3	4	.93904-03	7	3	4	-.46361-01	8	3	4	.36355-01	9	3	4	.85870-02	10	3	4	.77841-02
11	3	4	-.43938-01	12	3	4	.51390-01	13	3	4	.77830-01	14	3	4	.52308-01	15	3	4	.63890-02
16	3	4	.58340-02	17	3	4	.14641-01	18	3	4	.23730-01	19	3	4	-.15922-01	20	3	4	.52724-01
21	3	4	.95701-02	22	3	4	-.74230-01	23	3	4	.81755-01	24	3	4	.72784-02	25	3	4	.15390+00
1	4	4	.19270+00	2	4	4	.32272-02	3	4	4	.73547+00	4	4	4	.10000+01	5	4	4	.14975-01
6	4	4	-.15827-01	7	4	4	-.47076-01	8	4	4	.23281-01	9	4	4	.18134-01	10	4	4	-.18546-01
11	4	4	-.32778-01	12	4	4	.40987-01	13	4	4	.79580-01	14	4	4	.59937-01	15	4	4	-.15620-01
16	4	4	.10983-01	17	4	4	.34071-01	18	4	4	.36264-02	19	4	4	-.12366-01	20	4	4	.88376-01
21	4	4	-.33284-02	22	4	4	-.12746+00	23	4	4	.41409-01	24	4	4	-.26220-01	25	4	4	.15506+00
1	5	4	-.10441-01	2	5	4	.30827-01	3	5	4	.10750-01	4	5	4	.14975-01	5	5	4	.10000+01
6	5	4	-.85423+00	7	5	4	.27832+00	8	5	4	-.16109+00	9	5	4	.96560+00	10	5	4	-.85365+00
11	5	4	.25308+00	12	5	4	-.18204+00	13	5	4	-.52275-02	14	5	4	-.12039-01	15	5	4	.23029-01
16	5	4	.23227-01	17	5	4	.94296-02	18	5	4	.32481-01	19	5	4	-.80209-03	20	5	4	-.25402-01
21	5	4	.78850-01	22	5	4	.28723-01	23	5	4	.28864-03	24	5	4	.48329-01	25	5	4	-.19267-01
1	6	4	.16613-01	2	6	4	-.45986-01	3	6	4	.93904-03	4	6	4	-.15827-01	5	6	4	-.85423+00
6	6	4	.10000+01	7	6	4	-.22684+00	8	6	4	.28895+00	9	6	4	-.87067+00	10	6	4	.96991+00
11	6	4	-.21728+00	12	6	4	.29287+00	13	6	4	-.31713-01	14	6	4	-.25281-01	15	6	4	-.57833-01
16	6	4	-.27033-01	17	6	4	-.42910-01	18	6	4	-.45997-01	19	6	4	-.21251-01	20	6	4	.74433+02
21	6	4	-.71097-01	22	6	4	-.10320-01	23	6	4	-.46129-01	24	6	4	-.56161-01	25	6	4	.12611-01
1	7	4	.10471-01	2	7	4	.86404-02	3	7	4	-.46361-01	4	7	4	-.47076-01	5	7	4	.27832+00
6	7	4	-.22684+00	7	7	4	.10000+01	8	7	4	-.75830+00	9	7	4	.26274+00	10	7	4	-.22524+00
11	7	4	.88061+00	12	7	4	-.76176+00	13	7	4	-.21498-02	14	7	4	-.12541-01	15	7	4	.10978-01
16	7	4	-.69530-02	17	7	4	.18193-01	18	7	4	.38234-01	19	7	4	-.15412-01	20	7	4	-.96198-02
21	7	4	.27332-01	22	7	4	.15950-01	23	7	4	-.78504-02	24	7	4	-.19597-02	25	7	4	-.48653-01
1	8	4	.23627-01	2	8	4	-.24341-01	3	8	4	.36355-01	4	8	4	.23281-01	5	8	4	-.16109+00
6	8	4	.28895+00	7	8	4	-.75830+00	8	8	4	.10000+01	9	8	4	-.19957+00	10	8	4	.30662+00
11	8	4	-.74454+00	12	8	4	.90338+00	13	8	4	-.53462-01	14	8	4	-.43786-01	15	8	4	-.59431-01
16	8	4	-.27898-01	17	8	4	-.29951-01	18	8	4	-.52901-01	19	8	4	-.31771-01	20	8	4	-.17882-01
21	8	4	-.21044-01	22	8	4	-.21777-01	23	8	4	-.28702-01	24	8	4	-.67720-02	25	8	4	.36496-01
1	9	4	-.12735-01	2	9	4	.31813-01	3	9	4	.85870-02	4	9	4	.18134-01	5	9	4	.96560+00
6	9	4	-.87067+00	7	9	4	.26274+00	8	9	4	-.19957+00	9	9	4	.10000+01	10	9	4	-.87551+00
11	9	4	.26050+00	12	9	4	-.16690+00	13	9	4	.19132-02	14	9	4	-.44080-02	15	9	4	.26618-01
16	9	4	.24954-01	17	9	4	.18630+03	18	9	4	.35516-01	19	9	4	.33404-02	20	9	4	-.27728-01
21	9	4	.73020-01	22	9	4	.39964-01	23	9	4	.45308-02	24	9	4	.46073-01	25	9	4	-.16343-01

CORRELATION COEFFICIENTS

V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS	V	V	GR	COEFFICIENTS
1	10	4	.39296-01	2	10	4	-.48554-01	3	10	4	.77841-02	4	10	4	-.18546-01	5	10	4	-.85365+00
6	10	4	.96991+00	7	10	4	-.22524+00	8	10	4	.30662+00	9	10	4	-.87551+00	10	10	4	.10000+01
11	10	4	-.21482+00	12	10	4	.27624+00	13	10	4	-.37187-01	14	10	4	-.31672-01	15	10	4	-.61041-01
16	10	4	-.22173-01	17	10	4	-.46239-01	18	10	4	-.44565-01	19	10	4	-.90454-02	20	10	4	.27399-01
21	10	4	-.63889-01	22	10	4	-.40190-02	23	10	4	-.51719-01	24	10	4	-.59433-01	25	10	4	.13493-01
1	11	4	.19836-01	2	11	4	.14327-01	3	11	4	-.43938-01	4	11	4	-.32778-01	5	11	4	.25368+00
6	11	4	-.21728+00	7	11	4	.88061+00	8	11	4	-.74454+00	9	11	4	.26050+00	10	11	4	-.21482+00
11	11	4	.10000+01	12	11	4	-.74348+00	13	11	4	-.16061-01	14	11	4	-.26028-01	15	11	4	-.12072-01
16	11	4	-.37613-01	17	11	4	-.14986-02	18	11	4	.30223-01	19	11	4	-.18592-01	20	11	4	-.35731-02
21	11	4	.24243-01	22	11	4	.37930-01	23	11	4	-.46833-01	24	11	4	-.22320-01	25	11	4	-.53281-01
1	12	4	-.62693-02	2	12	4	-.22024-01	3	12	4	.51390-01	4	12	4	.40987-01	5	12	4	-.18204+00
6	12	4	.29287+00	7	12	4	-.76176+00	8	12	4	.90338+00	9	12	4	-.16690+00	10	12	4	.27624+00
11	12	4	-.74348+00	12	12	4	.10000+01	13	12	4	-.49270-01	14	12	4	-.36775-01	15	12	4	-.62615-01
16	12	4	-.35917-01	17	12	4	-.45304-01	18	12	4	-.53436-01	19	12	4	-.63249-01	20	12	4	-.29348-01
21	12	4	-.27576-01	22	12	4	-.15959-01	23	12	4	-.20839-01	24	12	4	.52182-02	25	12	4	.48605-01
1	13	4	-.24453-01	2	13	4	.22872-01	3	13	4	.77830-01	4	13	4	.79580-01	5	13	4	-.52275-02
6	13	4	-.31713-01	7	13	4	-.21498-02	8	13	4	-.53462-01	9	13	4	.19132-02	10	13	4	-.37187-01
11	13	4	-.16061-01	12	13	4	-.49270-01	13	13	4	.10000+01	14	13	4	.97684+00	15	13	4	.91560+00
16	13	4	.46633+00	17	13	4	.64709+00	18	13	4	.56958+00	19	13	4	.28546+00	20	13	4	.12030-01
21	13	4	.40942+00	22	13	4	-.11564+00	23	13	4	.78491+00	24	13	4	.34800+00	25	13	4	.13337-01
1	14	4	-.24957-01	2	14	4	-.39525-02	3	14	4	.52308-01	4	14	4	.59937-01	5	14	4	-.12039-01
6	14	4	-.25281-01	7	14	4	-.12541-01	8	14	4	-.43786-01	9	14	4	-.44080-02	10	14	4	-.31672-01
11	14	4	-.26028-01	12	14	4	-.36775-01	13	14	4	.97684+00	14	14	4	.10000+01	15	14	4	.91056+00
16	14	4	.46099+00	17	14	4	.64339+00	18	14	4	.57013+00	19	14	4	.28770+00	20	14	4	.12398-01
21	14	4	.39975+00	22	14	4	-.12052+00	23	14	4	.77857+00	24	14	4	.34612+00	25	14	4	.52339-02
1	15	4	-.35333-01	2	15	4	.30363-02	3	15	4	.63890-02	4	15	4	-.15620-01	5	15	4	.23029-01
6	15	4	-.57833-01	7	15	4	.10978-01	8	15	4	-.59431-01	9	15	4	.26618-01	10	15	4	-.61041-01
11	15	4	-.12072-01	12	15	4	-.62615-01	13	15	4	.91560+00	14	15	4	.91056+00	15	15	4	.10000+01
16	15	4	.47545+00	17	15	4	.66279+00	18	15	4	.58762+00	19	15	4	.31012+00	20	15	4	.21762-01
21	15	4	.40788+00	22	15	4	-.78783-01	23	15	4	.81450+00	24	15	4	.35044+00	25	15	4	-.18720-01
1	16	4	-.20143-01	2	16	4	.26506-01	3	16	4	.58340-02	4	16	4	.10983-01	5	16	4	.23227-01
6	16	4	-.27033-01	7	16	4	-.69530-02	8	16	4	-.27898-01	9	16	4	.24954-01	10	16	4	-.22173-01
11	16	4	-.37613-01	12	16	4	-.35917-01	13	16	4	.46633+00	14	16	4	.46099+00	15	16	4	.47545+00
16	16	4	.10000+01	17	16	4	.36132+00	18	16	4	.39297+00	19	16	4	.24994+00	20	16	4	-.61190-02
21	16	4	.29909+00	22	16	4	.49649-02	23	16	4	.41483+00	24	16	4	.24564+00	25	16	4	-.11014-01
1	17	4	-.16558-01	2	17	4	-.50759-02	3	17	4	.14641-01	4	17	4	.34071-01	5	17	4	.94296-02
6	17	4	-.42910-01	7	17	4	.18193-01	8	17	4	-.29951-01	9	17	4	.18630-03	10	17	4	-.46239-01
11	17	4	-.14986-02	12	17	4	-.45304-01	13	17	4	.64709+00	14	17	4	.64339+00	15	17	4	.66279+00
16	17	4	.36132+00	17	17	4	.10000+01	18	17	4	.53426+00	19	17	4	.23692+00	20	17	4	.23095-01
21	17	4	.32766+00	22	17	4	-.13748+00	23	17	4	.65176+00	24	17	4	.28462+00	25	17	4	-.17357-01
1	18	4	.78111-01	2	18	4	-.24490-01	3	18	4	.23730-01	4	18	4	.36264-02	5	18	4	.32481-01
6	18	4	-.45997-01	7	18	4	.38234-01	8	18	4	-.52901-01	9	18	4	.35516-01	10	18	4	-.44565-01
11	18	4	.30223-01	12	18	4	-.53436-01	13	18	4	.56958+00	14	18	4	.57013+00	15	18	4	.58762+00
16	18	4	.39297+00	17	18	4	.53426+00	18	18	4	.10000+01	19	18	4	.31031+00	20	18	4	.22783-01
21	18	4	.35682+00	22	18	4	.97543-01	23	18	4	.51741+00	24	18	4	.25925+00	25	18	4	-.35262-02

CORRELATION COEFFICIENTS

V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	V	V	GR COEFFICIENTS	
1	19	4	.11362+00	2	19	4	-.89761-02	3	19	4	-.15922-01	4	19	4	-.12366-01
6	19	4	-.21251-01	7	19	4	-.15412-01	8	19	4	-.31771-01	9	19	4	.33404-02
11	19	4	-.18592-01	12	19	4	-.63249-01	13	19	4	.28546+00	14	19	4	.28770+00
16	19	4	.24994+00	17	19	4	.23692+00	18	19	4	.31031+00	19	19	4	.10000+01
21	19	4	.30509+00	22	19	4	.12120-01	23	19	4	.28057+00	24	19	4	.99958-01
1	20	4	.30228-02	2	20	4	.36329-01	3	20	4	.52724-01	4	20	4	.88376-01
6	20	4	.74433-02	7	20	4	-.96198-02	8	20	4	-.17882-01	9	20	4	-.27728-01
11	20	4	-.35731-02	12	20	4	-.29348-01	13	20	4	.12030-01	14	20	4	.12398-01
16	20	4	-.61190-02	17	20	4	.23095-01	18	20	4	.22783-01	19	20	4	.18473+00
21	20	4	.10231+00	22	20	4	-.30170-01	23	20	4	.46698-01	24	20	4	-.53338-01
1	21	4	-.12877-01	2	21	4	.87885-01	3	21	4	.95701-02	4	21	4	-.33284-02
6	21	4	-.71097-01	7	21	4	.27332-01	8	21	4	-.21044-01	9	21	4	.73020-01
11	21	4	.24243-01	12	21	4	-.27576-01	13	21	4	.40942+00	14	21	4	.39975+00
16	21	4	.29909+00	17	21	4	.32706+00	18	21	4	.35682+00	19	21	4	.30509+00
21	21	4	.10000+01	22	21	4	.23018+00	23	21	4	.38921+00	24	21	4	.56270+00
1	22	4	.37983-01	2	22	4	-.17723-01	3	22	4	-.74230-01	4	22	4	-.12746+00
6	22	4	-.10320-01	7	22	4	.15950-01	8	22	4	-.21777-01	9	22	4	.39964-01
11	22	4	.37930-01	12	22	4	-.15959-01	13	22	4	-.11564+00	14	22	4	-.12052+00
16	22	4	.49649-02	17	22	4	-.13748+00	18	22	4	.97543-01	19	22	4	.12120-01
21	22	4	.23018+00	22	22	4	.10000+01	23	22	4	-.11297+00	24	22	4	.15398+00
1	23	4	-.39075-01	2	23	4	.58056-01	3	23	4	.81755-01	4	23	4	.41409-01
6	23	4	-.46129-01	7	23	4	-.78504-02	8	23	4	-.28702-01	9	23	4	.45308-02
11	23	4	-.40833-01	12	23	4	-.20839-01	13	23	4	.78491+00	14	23	4	.77857+00
16	23	4	.41483+00	17	23	4	.65176+00	18	23	4	.51741+00	19	23	4	.28057+00
21	23	4	.38921+00	22	23	4	-.11297+00	23	23	4	.10000+01	24	23	4	.35946+00
1	24	4	-.71243-01	2	24	4	.11820+00	3	24	4	.72784-02	4	24	4	-.26220-01
6	24	4	-.56101-01	7	24	4	-.19597-02	8	24	4	-.67720-02	9	24	4	.46073-01
11	24	4	-.22320-01	12	24	4	.52182-02	13	24	4	.34800+00	14	24	4	.34612+00
16	24	4	.24564+00	17	24	4	.28462+00	18	24	4	.25925+00	19	24	4	.99958-01
21	24	4	.56270+00	22	24	4	.15398+00	23	24	4	.35946+00	24	24	4	.10000+01
1	25	4	.90134-01	2	25	4	.41854-01	3	25	4	.15390+00	4	25	4	.15506+00
5	25	4	.12611-01	7	25	4	-.48653-01	8	25	4	.36496-01	9	25	4	-.16343-01
11	25	4	-.53281-01	12	25	4	.48605-01	13	25	4	.13337-01	14	25	4	.52339-02
16	25	4	-.11014-01	17	25	4	-.17357-01	18	25	4	-.35262-02	19	25	4	-.30214-01
21	25	4	.91543-03	22	25	4	-.88638-02	23	25	4	.76168-02	24	25	4	-.21149-01
												5	19	4	-.80209-03
												10	19	4	-.90454-02
												15	19	4	.31012+00
												20	19	4	.18473+00
												25	19	4	-.30214-01
												5	20	4	-.25402-01
												10	20	4	.27399-01
												15	20	4	.21762-01
												20	20	4	.10000+01
												25	20	4	.19592-01
												5	21	4	.78850-01
												10	21	4	-.63889-01
												15	21	4	.40788+00
												20	21	4	.10231+00
												25	21	4	.91543-03
												5	22	4	.28723-01
												10	22	4	-.40190-02
												15	22	4	-.78783-01
												20	22	4	-.30170-01
												25	22	4	-.88638-02
												5	23	4	.28864-03
												10	23	4	-.51719-01
												15	23	4	.81450+00
												20	23	4	.46698-01
												25	23	4	.76168-02
												5	24	4	.48329-01
												10	24	4	-.59433-01
												15	24	4	.35044+00
												20	24	4	-.53338-01
												25	24	4	-.21149-01
												5	25	4	-.19267-01
												10	25	4	.13493-01
												15	25	4	-.18720-01
												20	25	4	.19592-01
												25	25	4	.10000+01

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	1	4	-.21949-01	2	1	4	.47861-01	3	1	4	.49449-01	4	1	4	.39665-01
6	1	4	-.21525+00	7	1	4	.13155+00	8	1	4	-.17777+00	9	1	4	.17960+00
11	1	4	.10194+00	12	1	4	-.17741+00	13	1	4	.90155+00	14	1	4	.90158+00
16	1	4	.57263+00	17	1	4	.74479+00	18	1	4	.69303+00	19	1	4	.40362+00
21	1	4	.50914+00	22	1	4	-.40178-01	23	1	4	.84112+00	24	1	4	.48411+00
1	2	4	-.18378-01	2	2	4	.40030-01	3	2	4	-.59289-01	4	2	4	-.41875-01
6	2	4	-.78984+00	7	2	4	.69075+00	8	2	4	-.66860+00	9	2	4	.77668+00
11	2	4	.67831+00	12	2	4	-.66391+00	13	2	4	-.19420+00	14	2	4	-.20373+00
16	2	4	-.12038+00	17	2	4	-.14600+00	18	2	4	-.10560+00	19	2	4	-.76117-01
21	2	4	-.50511-01	22	2	4	.57015-01	23	2	4	-.18441+00	24	2	4	-.65655-01
1	3	4	.33261-02	2	3	4	-.33071-01	3	3	4	-.14293+00	4	3	4	-.14478+00
6	3	4	.50184+00	7	3	4	.59380+00	8	3	4	-.60604+00	9	3	4	-.54285+00
11	3	4	.59406+00	12	3	4	-.61790+00	13	3	4	.25920-01	14	3	4	.26298-01
16	3	4	-.18582-02	17	3	4	.21820-01	18	3	4	.35278-01	19	3	4	.32121-01
21	3	4	-.42753-01	22	3	4	.10908-01	23	3	4	-.63539-02	24	3	4	-.58519-01
1	4	4	.37172+00	2	4	4	-.80489-03	3	4	4	.84966+00	4	4	4	.86795+00
6	4	4	.20580-01	7	4	4	.73459-01	8	4	4	-.85797-01	9	4	4	-.33166-01
11	4	4	.76374-01	12	4	4	-.82658-01	13	4	4	.60077-01	14	4	4	.36851-01
16	4	4	-.48730-01	17	4	4	.12188-01	18	4	4	-.20065-01	19	4	4	-.49651-02
21	4	4	-.13874+00	22	4	4	-.26752+00	23	4	4	.41908-01	24	4	4	-.18588+00
1	5	4	.20889+00	2	5	4	.20127+00	3	5	4	.15120+00	4	5	4	.11700+00
6	5	4	.47881-01	7	5	4	.14237-01	8	5	4	.73408-03	9	5	4	-.15107-01
11	5	4	.34045-01	12	5	4	-.19744-02	13	5	4	-.16602+00	14	5	4	-.17117+00
16	5	4	.39847-01	17	5	4	-.18810+00	18	5	4	.95704-01	19	5	4	.20690+00
21	5	4	.57480+00	22	5	4	.69921+00	23	5	4	-.13551+00	24	5	4	.48416+00
1	6	4	.47199+00	2	6	4	-.45130+00	3	6	4	-.16958+00	4	6	4	-.12033+00
6	6	4	-.38266-01	7	6	4	-.43161-01	8	6	4	.37983-01	9	6	4	.36351-01
11	6	4	-.34668-01	12	6	4	-.85941-02	13	6	4	-.54208-01	14	6	4	-.35970-01
16	6	4	.40317-01	17	6	4	.34309-02	18	6	4	.19656+00	19	6	4	.56843+00
21	6	4	-.76009-01	22	6	4	.70500-01	23	6	4	-.68360-01	24	6	4	-.38916+00
1	7	4	-.31966+00	2	7	4	.53910+00	3	7	4	-.59663-01	4	7	4	-.34468-01
6	7	4	-.27940-01	7	7	4	-.31173-01	8	7	4	-.30149-01	9	7	4	-.21263-01
11	7	4	-.47681-01	12	7	4	-.26533-01	13	7	4	-.23794-01	14	7	4	-.35553-01
16	7	4	-.37790-01	17	7	4	-.21342-01	18	7	4	-.16472+00	19	7	4	.23897+00
21	7	4	.84466-01	22	7	4	-.30782+00	23	7	4	.38460-01	24	7	4	-.49152-01
1	8	4	.27751+00	2	8	4	.30259+00	3	8	4	-.22385+00	4	8	4	-.22468+00
6	8	4	-.16191-01	7	8	4	-.16486-02	8	8	4	-.12289-02	9	8	4	-.12825-02
11	8	4	.21841-02	12	8	4	-.78942-02	13	8	4	.27454-01	14	8	4	.32553-01
16	8	4	.14024-02	17	8	4	.21886-01	18	8	4	.53981-01	19	8	4	-.13213-01
21	8	4	-.91956-01	22	8	4	.64818-04	23	8	4	.66198-02	24	8	4	-.12885+00
1	9	4	.44584+00	2	9	4	.55859+00	3	9	4	-.11628-01	4	9	4	-.59421-02
6	9	4	.16406-02	7	9	4	-.96335-02	8	9	4	.17071-01	9	9	4	-.28947-02
11	9	4	-.84170-02	12	9	4	.37606-02	13	9	4	-.22169-01	14	9	4	-.26064-01
16	9	4	.86708-01	17	9	4	-.16122-01	18	9	4	.35520-01	19	9	4	.18979+00
21	9	4	-.71484-01	22	9	4	-.14349+00	23	9	4	-.20634-01	24	9	4	-.39675-01
												5	1	4	.17516+00
												10	1	4	-.21854+00
												15	1	4	.90913+00
												20	1	4	.45925-01
												25	1	4	-.14443-01
												5	2	4	.76944+00
												10	2	4	-.78765+00
												15	2	4	-.16732+00
												20	2	4	-.26146-01
												25	2	4	-.54641-01
												5	3	4	-.53869+00
												10	3	4	.50312+00
												15	3	4	.26646-01
												20	3	4	.36916-01
												25	3	4	-.76839-01
												5	4	4	-.31022-01
												10	4	4	-.27308-01
												15	4	4	-.28342-01
												20	4	4	.15356+00
												25	4	4	.33262+00
												5	5	4	-.11264-01
												10	5	4	.63405-01
												15	5	4	-.16244+00
												20	5	4	.16485+00
												25	5	4	.12386+00
												5	6	4	.36028-01
												10	6	4	-.12872-01
												15	6	4	-.59241-02
												20	6	4	.40332+00
												25	6	4	-.75620-01
												5	7	4	-.22531-01
												10	7	4	-.22491-01
												15	7	4	-.27897-01
												20	7	4	.71208+00
												25	7	4	.25035-01
												5	8	4	-.54390-02
												10	8	4	-.12269-01
												15	8	4	.31711-01
												20	8	4	-.14058+00
												25	8	4	.79801+00
												5	9	4	-.45431-02
												10	9	4	.44697-02
												15	9	4	-.25597-01
												20	9	4	-.31833+00
												25	9	4	-.43832+00

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	10	4	-.35672+00	2	10	4	.76540-01	3	10	4	.10286+00	4	10	4	.78465-01
6	10	4	-.13025-02	7	10	4	-.57518-01	8	10	4	-.77978-01	9	10	4	-.54472-02
11	10	4	-.64780-01	12	10	4	-.56744-01	13	10	4	-.43347-01	14	10	4	-.51955-01
16	10	4	.59208+00	17	10	4	-.12420+00	18	10	4	.98761-01	19	10	4	.20508+00
21	10	4	-.14549+00	22	10	4	.18564+00	23	10	4	-.87349-01	24	10	4	-.25714+00
1	11	4	.30514-01	2	11	4	.21531+00	3	11	4	.35022-01	4	11	4	-.17455-02
6	11	4	-.98314-02	7	11	4	-.16710-01	8	11	4	.16491-01	9	11	4	.61310-02
11	11	4	.62839-02	12	11	4	.24340-01	13	11	4	.72502-01	14	11	4	.68743-01
16	11	4	-.11487+00	17	11	4	.73469-01	18	11	4	.25310+00	19	11	4	-.38217+00
21	11	4	-.23654+00	22	11	4	.44848+00	23	11	4	.63847-01	24	11	4	-.27972+00
1	12	4	.26156+00	2	12	4	-.67792-01	3	12	4	-.98835-01	4	12	4	-.31157-01
6	12	4	.16318-01	7	12	4	.31706-01	8	12	4	.32649-01	9	12	4	.22741-01
11	12	4	.29099-01	12	12	4	.18878-01	13	12	4	-.47440-01	14	12	4	-.41012-01
16	12	4	.51818+00	17	12	4	-.10681-01	18	12	4	-.68519-01	19	12	4	-.39566+00
21	12	4	.20486-01	22	12	4	-.15813+00	23	12	4	-.49161-01	24	12	4	.14766+00
1	13	4	-.11327+00	2	13	4	.26034-01	3	13	4	.12323-01	4	13	4	.17013-01
6	13	4	.60803-01	7	13	4	.11057+00	8	13	4	.11886+00	9	13	4	.35920-01
11	13	4	.11931+00	12	13	4	.10912+00	13	13	4	-.19504+00	14	13	4	-.19704+00
16	13	4	-.15442-01	17	13	4	.35390+00	18	13	4	.44336+00	19	13	4	-.73181-02
21	13	4	.50726-01	22	13	4	-.16420+00	23	13	4	-.79200-01	24	13	4	.18828-01
1	14	4	-.42200-01	2	14	4	.27601-01	3	14	4	.83661-02	4	14	4	-.43818-02
6	14	4	.15402+00	7	14	4	.23915+00	8	14	4	.24356+00	9	14	4	.14749+00
11	14	4	.25924+00	12	14	4	.23503+00	13	14	4	.10570+00	14	14	4	.10522+00
16	14	4	.18559-01	17	14	4	-.19280+00	18	14	4	-.81540-01	19	14	4	.20216-01
21	14	4	.13816+00	22	14	4	-.61550-03	23	14	4	-.25685-01	24	14	4	-.18513+00
1	15	4	.20162-01	2	15	4	.12003-01	3	15	4	-.17306-01	4	15	4	.40357-01
6	15	4	.19297-01	7	15	4	.49226-01	8	15	4	.42687-01	9	15	4	.17512-01
11	15	4	.29017-01	12	15	4	.26057-01	13	15	4	-.71492-01	14	15	4	-.71717-01
16	15	4	.63114-01	17	15	4	.43361+00	18	15	4	-.37749+00	19	15	4	.51968-01
21	15	4	.18797-01	22	15	4	.17022+00	23	15	4	.89793-01	24	15	4	-.98944-01
1	16	4	.89129-02	2	16	4	-.73471-03	3	16	4	-.55491-01	4	16	4	.49535-01
6	16	4	-.54552-01	7	16	4	-.91607-01	8	16	4	-.69149-01	9	16	4	-.49699-01
11	16	4	-.75455-01	12	16	4	-.81721-01	13	16	4	.15015-01	14	16	4	.15125-01
16	16	4	-.15390-01	17	16	4	.20179-01	18	16	4	.20429-01	19	16	4	-.14510+00
21	16	4	.43293+00	22	16	4	-.68027-01	23	16	4	-.84692-01	24	16	4	-.32126+00
1	17	4	.20257-01	2	17	4	-.21937-01	3	17	4	.19252+00	4	17	4	-.20903+00
6	17	4	-.23979-02	7	17	4	.32117-01	8	17	4	.32209-02	9	17	4	-.99422-02
11	17	4	-.22686-01	12	17	4	-.37827-02	13	17	4	-.13371+00	14	17	4	-.13304+00
16	17	4	.18641-01	17	17	4	-.97054-01	18	17	4	.13196-01	19	17	4	-.27465-01
21	17	4	.67197-01	22	17	4	-.24336-01	23	17	4	.38168+00	24	17	4	-.71649-01
1	18	4	-.11957-01	2	18	4	-.23052-02	3	18	4	-.28355+00	4	18	4	.28180+00
6	18	4	-.11072-01	7	18	4	.67149-02	8	18	4	.13686-01	9	18	4	-.74213-02
11	18	4	.30277-01	12	18	4	.19519-01	13	18	4	-.57902-01	14	18	4	-.57689-01
16	18	4	-.46913-02	17	18	4	-.87691-01	18	18	4	.32636-01	19	18	4	.21977-02
21	18	4	-.12535-01	22	18	4	.14658-01	23	18	4	.23476+00	24	18	4	-.30865-02
												5	10	4	-.12584-01
												10	10	4	-.88843-02
												15	10	4	-.48561-01
												20	10	4	-.16079+00
												25	10	4	.63814-01
												5	11	4	.22938-02
												10	11	4	-.65657-02
												15	11	4	.83324-01
												20	11	4	.25083+00
												25	11	4	-.14565+00
												5	12	4	.33496-01
												10	12	4	.30523-01
												15	12	4	-.48920-01
												20	12	4	.24930+00
												25	12	4	-.27206-01
												5	13	4	.59917-01
												10	13	4	.57952-01
												15	13	4	-.18102+00
												20	13	4	-.20695-01
												25	13	4	.29582-01
												5	14	4	.17457+00
												10	14	4	.17786+00
												15	14	4	.70646-01
												20	14	4	-.17753-01
												25	14	4	-.13882-02
												5	15	4	.20318-01
												10	15	4	.21759-01
												15	15	4	-.17151-01
												20	15	4	-.25348-01
												25	15	4	-.23905-02
												5	16	4	-.68189-01
												10	16	4	-.53245-01
												15	16	4	-.19055-01
												20	16	4	-.63957-01
												25	16	4	-.25038-01
												5	17	4	-.25190-02
												10	17	4	-.60472-02
												15	17	4	-.24445-01
												20	17	4	-.14801-01
												25	17	4	-.97082-03
												5	18	4	-.17056-01
												10	18	4	-.55479-02
												15	18	4	-.36604-01
												20	18	4	-.18984-01
												25	18	4	.33518-02

COMMON FACTOR COEFFICIENTS, INVERSE

V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	V	F	GR COEFFICIENTS	
1	19	4	.23015-02	2	19	4	.44962-02	3	19	4	-.22633-01	4	19	4	.18353-01
6	19	4	.16325+00	7	19	4	.74232-02	8	19	4	-.59099-01	9	19	4	.11373+00
11	19	4	-.18376+00	12	19	4	-.12778+00	13	19	4	-.45514-02	14	19	4	-.45829-02
16	19	4	-.23026-01	17	19	4	.76084-02	18	19	4	.10707-01	19	19	4	-.12517-01
21	19	4	.30945-02	22	19	4	-.60737-02	23	19	4	.13755-01	24	19	4	-.68420-04
1	20	4	.45611-03	2	20	4	-.17988-03	3	20	4	.82003-02	4	20	4	-.12573-01
6	20	4	.37477-01	7	20	4	-.24792+00	8	20	4	-.72153-01	9	20	4	.87491-01
11	20	4	.17810+00	12	20	4	-.53966-02	13	20	4	-.66772-02	14	20	4	-.66566-02
16	20	4	-.37175-02	17	20	4	.87382-02	18	20	4	-.42219-02	19	20	4	-.91688-03
21	20	4	.10321-03	22	20	4	-.81275-02	23	20	4	.22098-01	24	20	4	.18948-02
1	21	4	.10303-01	2	21	4	-.27471-02	3	21	4	-.45115-02	4	21	4	-.10738-02
6	21	4	.39781-01	7	21	4	.45209-01	8	21	4	-.21629+00	9	21	4	.72130-01
11	21	4	-.49848-01	12	21	4	.21046+00	13	21	4	-.12532-02	14	21	4	-.12044-02
16	21	4	-.14716-02	17	21	4	.51894-02	18	21	4	.10346-02	19	21	4	.12628-02
21	21	4	.56640-02	22	21	4	-.20181-02	23	21	4	-.16984-02	24	21	4	-.45879-02
1	22	4	-.20717-02	2	22	4	.43501-02	3	22	4	-.28910-02	4	22	4	.23172-01
6	22	4	.27531-02	7	22	4	-.22795-02	8	22	4	.33029-04	9	22	4	-.56497-03
11	22	4	.18993-02	12	22	4	.18708-02	13	22	4	-.10554+00	14	22	4	-.10593+00
16	22	4	-.28929-02	17	22	4	-.91015-02	18	22	4	.35258-02	19	22	4	-.61056-02
21	22	4	.49107-02	22	22	4	-.10542-01	23	22	4	-.46479-01	24	22	4	.16396-02
1	23	4	-.19469-02	2	23	4	.16485-03	3	23	4	.14532-03	4	23	4	-.24924-04
6	23	4	-.11487+00	7	23	4	.10056-01	8	23	4	-.15675-01	9	23	4	-.15823-02
11	23	4	-.16051-01	12	23	4	.92116-02	13	23	4	-.26129-03	14	23	4	-.22998-03
16	23	4	-.15185-02	17	23	4	.15087-02	18	23	4	.10899-02	19	23	4	-.80258-03
21	23	4	-.87537-03	22	23	4	-.61970-03	23	23	4	-.67848-04	24	23	4	.80108-03
1	24	4	-.13010-02	2	24	4	.23323-03	3	24	4	.12453-02	4	24	4	-.23392-03
6	24	4	-.10036-02	7	24	4	.13049-01	8	24	4	.32293-01	9	24	4	.10543+00
11	24	4	-.11254-01	12	24	4	-.30599-01	13	24	4	-.28471-03	14	24	4	-.28510-03
16	24	4	-.83033-04	17	24	4	.26352-04	18	24	4	.14055-02	19	24	4	-.65170-03
21	24	4	-.11439-02	22	24	4	-.50423-03	23	24	4	-.56702-03	24	24	4	.18316-02
1	25	4	-.12735-02	2	25	4	.18316-02	3	25	4	.17087-02	4	25	4	.16098-02
6	25	4	-.63949-04	7	25	4	.23175-03	8	25	4	-.37302-03	9	25	4	.56334-04
11	25	4	.22505-03	12	25	4	-.27622-03	13	25	4	-.10618+00	14	25	4	.10601+00
16	25	4	-.55833-04	17	25	4	-.70222-04	18	25	4	-.66353-04	19	25	4	-.38781-04
21	25	4	-.50956-04	22	25	4	.00000	23	25	4	-.80096-04	24	25	4	-.45596-04
												5	19	4	.17329+00
												10	19	4	.12586+00
												15	19	4	-.37112-02
												20	19	4	-.19932-02
												25	19	4	.13597-02
												5	20	4	.24662-01
												10	20	4	.72587-01
												15	20	4	-.46603-02
												20	20	4	-.55502-03
												25	20	4	.45199-03
												5	21	4	-.49309-01
												10	21	4	-.13662-01
												15	21	4	-.21520-02
												20	21	4	.33048-02
												25	21	4	-.12561-02
												5	22	4	-.12551-02
												10	22	4	.29292-02
												15	22	4	.25882+00
												20	22	4	-.19726-02
												25	22	4	.33362-02
												5	23	4	.55994-02
												10	23	4	.11926+00
												15	23	4	-.21191-03
												20	23	4	-.22358-02
												25	23	4	-.14359-03
												5	24	4	-.98604-01
												10	24	4	.88771-02
												15	24	4	-.28255-03
												20	24	4	.21727-03
												25	24	4	.19767-03
												5	25	4	.56313-04
												10	25	4	-.13233-03
												15	25	4	-.85091-04
												20	25	4	.00000
												25	25	4	.00000



GEORGIA INSTITUTE of TECHNOLOGY

Physical Sciences Division

225 North Avenue N. W.
Atlanta, Georgia 30332
(404) 873-4211 Ext.5625

January 25, 1971

National Aeronautics and Space Administration
George C. Marshall Space Flight Center
Huntsville, Alabama 35812

Attention: Mr. H. K. Katz, A&TS-MS-DIR

Subject: Fifth Bi-Monthly Letter Progress Report
Contract No. NAS8-25703
Project: Statistical Analysis of Medical Data



Gentlemen:

No further work has been done on the subject contract since the last bimonthly report, while waiting for word on the direction which Phase II might take.

A telephone call was received on January 8, 1971 from Mr. M. Miller in the Computation Laboratory, asking for information on the techniques we had used, and indicating that there were some discrepancies between correlation coefficients computed there and those which we had reported. In this connection, he mentioned that the second tape sent us was an unedited tape, as was the first. It had been our understanding that the original of the first copy sent us had been found to have errors, and that these had been corrected on the second tape forwarded approximately one month later.

If no further agreement is reached regarding further work to be done during the remaining two months, a final report will be issued and the two tapes returned.

Respectfully submitted,

Louis C. Young, Project Director
A-1242

LCY/emy

FINAL REPORT

PROJECT A-1242

A STATISTICAL DEFINITION OF HEALTH

By L. C. Young

Prepared for

George C. Marshall Space Flight Center
National Aeronautical and Space Administration
Huntsville, Alabama

Contract NAS8-25703

April, 1971



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FOREWORD

The following report is based upon a statistical view of a large number of physical examinations performed at Marshall Space Flight Center, coded to preserve anonymity upon release.

The author and the staff of the Bioengineering Center of the Georgia Institute of Technology wish to express their gratitude to Marshall Space Flight Center for the opportunity to use these data.

The author further wishes to express his appreciation to the Engineering Experiment Station and the Georgia Tech Research Institute for underwriting his effort and ensuring that funds would be found for the considerable cost of computation.

It is our earnest hope and expectation that the heuristic work reported in these pages will serve to further the efficient and early detection of illness.

INTRODUCTION

Evidence of illness in a patient presumes a knowledge of the same patient in a (different) state of health. The difference may be noted by having previously observed the same person (in a different condition) at a time when there was no specific reason to assume that the person was ill. The difference may also be noted by comparing the patient to a hypothetical healthy group of similar age, sex, and any other distinguishing characteristics. It is the latter means of detecting illness with which this study has been concerned.

A simple system of detecting physiological abnormality suggesting illness would be achieved by examining each physiological measurement of a patient (such as pulse, systolic blood pressure, diastolic blood pressure, etc. following a state of rest) and comparing each in turn with a distribution of that measurement for a group of people of which the patient might be considered a characteristic member. Frequency distributions of almost all such measures have a single peak and are low in frequency at either extreme of measurement. Consequently, measurements of healthy patients tend more often to be between the extremes. Conversely, a measurement which is extreme may be indicative of an unhealthy state, although there are some states of illness which will not lead to an extreme of a given physiological measurement.

In many avenues of statistical research it is customary in such a case to set two limits--one near the lower extreme such that some fraction such as 1 in 100 of normal persons have a lower measurement, and the other near the upper extreme such that a similar fraction of healthy persons have a higher measurement. (The limits are most efficient, for a given

elliptical limit depends on knowing the orientations and magnitudes of the axes. These are determined by the correlation and by the risk of falsely excluding extremes from the group, as well as by the spread of each separate measurement distribution. All of these are easily obtained by standard statistical procedures.

It can be seen by extension of the foregoing (more easily than it can be depicted) that a triplet of physical measurements could similarly be judged for normality, by determining whether the point representing them in three-dimensional space fell within an ellipsoidal "balloon" limit around the previously observed cluster of such points for a healthy group. It takes more numbers to describe the ellipsoidal shape and orientation, of course, but the principle and the mechanics of doing so remain the same as in the simpler case.

In the same way, finally, an N-dimensional ellipsoid may be specified as a limit for comparing a set of N physical measurements on one individual with similar sets of N on each of many individuals previously examined and judged to be normal members of one homogeneous healthy group. It might be true that no one of the N-multiplet measurements on a given individual might be exceptional, but that all of them considered in a single judgment are extreme enough to suggest abnormality. The purpose of having a single judgment would be to permit a computed statistic to be used to alert professional medical personnel to an uncommon combination of physical measurements which might be indicative of some abnormal physiological state such as illness.

PRINCIPAL PROCEDURES

To obtain a mathematical specification of a hyperellipsoid in N dimensional space is a straightforward procedure, if one starts from homogeneous data. Many of the steps have been mentioned or implied in the introduction. The relative precision with which each of the steps is carried out depends largely on prescience of the degree to which the data will support a precise conclusion. Aspects of this will be discussed in the following section.

The first step is to examine the frequency (or probability density) distribution of each of the N measurements. The purpose is to decide whether the distribution is significantly non-Gaussian in shape to require transformation. The reason for this is that the Gaussian distribution of a variable X_1

$$P_1 = C_1 e^{-K_1 X_1^2}$$

is the only distribution which can lead to an ellipsoidal bound of equal density (through consideration of a set of independent variables X_j linearly related to the physical measurements)

$$P_F = C_1 e^{-K_1 X_1^2} \cdot C_2 e^{-K_2 X_2^2} \cdot \dots \cdot C_N e^{-K_N X_N^2}$$

or

$$P_F = C_o e^{-\sum_j K_j X_j^2}$$

where the C 's and K 's are constants.

For this to be true, we have used the coordinate system of the ellipsoid axes, X_j , rather than that of the transformed scale, t_j , of the (correlated) physical measurement. The relationship between these represents the orientation of the ellipsoid system occasioned by the correlation. Each of the X_j is related to the set of transformed measurements t by the form

$$X_i = \sum_{j=1}^N A_{ij} t_j$$

where each t_j has a Gaussian distribution with zero mean and unit variance $N(0,1)$ obtained by normalizing as necessary the transform T_j of the original scale of the possibly non-Gaussian distribution of physical measurements P_j ,

$$t_j = (T_j - \bar{T}_j)/S_j$$

where $T_j = \sqrt{P_j}$, or $\log(P_j)$, for example, or even any rational piecewise transformation as may be needed to reasonably reshape the probability density distribution.

Once an appropriate T has been found (Gaussian-cumulative-probability-scale graph paper is convenient but tends in the author's experience to give the extremes more representation than their variability warrants), the means $\bar{T}_j$ and S_j can be computed. Determination of the coefficients A_{ij} is next, and these can be obtained by use of factor analysis (or eigenvector) computational routines available on high-speed computers. To obtain the A_{ij} , it is necessary to compute the correlation coefficient of each pair of t 's. Whether or not the computer routine is arranged to do this internally, using the transformed data as input, there is value in examining the array of correlation coefficients for validity--as was found in the present case and will be discussed later.

The eigenvectors of the correlation matrix are next obtained. These make up a matrix whose inverse is also (because the correlation matrix is symmetrical) numerically equal to its transpose and consists of the elements A_{ij} . The eigenvalues d_j of the correlation matrix are also obtained.

Finally, the criterion F is formed

$$F = \sum_{j=1}^N x_j^2 / d_j$$

whereby any individual whose N measurements have been observed in physical examination can be compared to the "healthy" group whose homogeneous characteristics have been used to determine the $\bar{T}_j$, S_j , A_{ij} defining the group. Due to the transformations which have been made, F is distributed in accord with the Chi-square probability distribution with N degrees of freedom. Accordingly, it can be used as a limit, with known risk of erroneously rejecting the null hypothesis (that the newly examined patient is to be considered as one of the healthy group until his measurements--through a large value of F--have led one to believe otherwise).

Among the physiological observations made, in the data common to the groups, were some 54 which were binary in nature and noted abnormality or lack of it in each of several traits and features. Although the discrete nature of these made it impossible to treat them in the same way as the other, variable measurements, it was decided that they could be included as a total count of abnormalities.

Twenty-five independent variables were thus on hand to serve as a basis of the statistical definition of health. Before using them for that purpose, however, it was necessary to determine the magnitude of their dependence (and remove the component of such dependence, if significant) upon the age and height of the individual. Within each of the four groups, this dependence was examined on the basis of the (least-squares) regression equation

$$V_i = c + a_1A + h_1H + a_2A^2 + h_2H^2$$

(where the lower case letters are constants to be determined),

$i = 1 \text{ to } 25$

using the "step up" procedure. The results are shown in Table I, in the form of potential percentage reduction in the variance of the physiological measures. To avoid undue computational complexity in the final relationship between a person's measurement set and his health criterion F , it was decided to give consideration only to those significant ($P < .001$) dependencies which would reduce the variance of the variable by more than 2%. Only eleven, among the four groups, met this condition. These, in the form of the regression equations above, were used to transform the original measurement on each individual in that group; as may be noted, the change was in general usually small.

Next, a frequency distribution was obtained of each variable for each of the four groups. In general, these were rational, but the visual acuity data exhibited discontinuities which were assumed to be characteristic either of the method of examination or of the equipment.

Those distributions were noted which would need a change in scale to be made sufficiently Gaussian. The only distributions which could not be so treated were those of the acuity measurements which had their peak at the lower end of their scale--i.e., 20. It was finally decided to retain these measurements, at least in initial trials, with modification of the scale. A way has been devised which is believed to be adequate in handling this type of data, but the course of events has kept it from being proven in worth. In any case, the high degree of correlation among acuity data indicates a great redundancy of information, so that there is less to be gained from them than the number of them might imply.

The two types of transformation, which proved satisfactory in reshaping the remaining distributions into adequately Gaussian form, were the square root of the measurement scale and the logarithm (using any base) of the measurement scale. Proper allowance had to be made in viewing these results, of course, for the fact that the original measurement was made in some discontinuous form with occasional gaps between data. (For example, the largest group commonly yielded a pulse rate of 60, but none of 61, 62, or 63). As is common in such cases, therefore, the class boundaries into which one is more or less forced upon transformation led to some odd-looking gaps which were revealed as quite plausible upon closer inspection.

Next, the normalized deviations

$$z_i = (t_i - \bar{t}_i) / S_i \quad i = 1 \text{ to } 25$$

The matrix of coefficients of the principal components had been computed from the (now suspect) correlation coefficient matrix for each of the four groups, as were the eigenvalues. The former factor coefficients have already been reported elsewhere (Fourth Progress Report) along with the correlation coefficients: the eigenvalues are listed in the Appendix. Assuming that the data had been further edited and that the elements of the correlation matrix had been validated as mentioned earlier, then one could use the forelisted coefficients in the relationships established in the previous section to test the normalcy of physiological measurements of any newly considered individual.

CONCLUSION

The foregoing constitutes but one segment, which may be considered to be that of definition, of the total health system. It is, of course, quite likely that other segments would utilize some of the same measurement data which were employed in the definition phase, and possibly some of the derived statistical data. In the design and engineering of a total system, the interface of this with subsequent subsystems might be facilitated by use of some of the statistical output produced in this segment.

APPENDIX

TABLE II

EIGENVALUES OF THE CORRELATION MATRIX

FEMALES		MALE	
UNDER 45	OVER 45	UNDER 45	OVER 45
7.231	6.696	6.080	5.502
5.707	5.287	4.580	4.480
2.154	2.642	1.977	2.604
1.620	1.778	1.640	1.912
1.297	1.405	1.367	1.415
1.148	1.149	1.141	1.182
1.020	1.077	1.022	1.107
.931	1.000	.988	.958
.910	.908	.836	.880
.644	.606	.810	.752
.626	.598	.712	.719
.455	.492	.691	.639
.260	.375	.620	.548
.256	.257	.570	.476
.162	.249	.491	.405
.162	.127	.451	.374
.118	.111	.283	.286
.099	.082	.282	.234
.064	.076	.244	.141
.060	.036	.111	.114
.025	.019	.046	.105
.021	.018	.021	.092
.020	.008	.018	.028
.006	.003	.013	.023
.008	.001	.005	.023

TABLE III
AVERAGES OF THE TRANSFORMED VARIABLES

VARIABLE	FEMALES		MALES	
	UNDER 45	OVER 45	UNDER 45	OVER 45
1	137.211	143.954	178.566	180.096
2	8.570	8.661	8.112	8.374
3	112.949	121.631	120.746	127.256
4	71.213	74.662	74.492	78.329
5	.782	.795	-.555	-.638
6	.927	-.802	.559	-.268
7	-.734	1.014	-1.857	.987
8	-3.284	1.063	-2.776	.794
9	-2.123	-3.469	-3.481	-4.571
10	.619	-.934	-.148	-.783
11	-.523	1.176	-1.601	.926
12	-2.707	1.002	-3.128	.689
13	130.782	126.857	146.784	142.939
14	39.055	37.748	43.625	42.555
15	1.783	1.761	1.768	1.801
16	1.821	1.834	1.883	1.886
17	2.240	2.280	2.297	2.316
18	5.224	5.538	6.529	6.658
19	3.035	3.155	3.447	3.404
20	-156.885	-160.000	-154.018	-154.960
21	1.006	.901	1.236	1.252
22	198.238	256.025	242.158	355.912
23	8.468	7.786	8.077	7.907
24	-15.289	-46.890	-36.189	-46.411
25	-.140	.960	.435	1.031
PEOPLE	156.	65.	1107.	782.

TABLE IV

STANDARD DEVIATIONS OF THE TRANSFORMED VARIABLES

VARIABLE	FEMALES		MALES	
	UNDER 45	OVER 45	UNDER 45	OVER 45
1	28.055	23.470	23.499	23.790
2	1.761	1.449	2.736	2.163
3	19.074	15.054	17.093	19.343
4	11.824	8.671	10.934	11.061
5	.856	.760	2.425	2.016
6	.540	2.136	.735	1.770
7	3.598	.306	4.442	.303
8	3.541	.857	3.613	1.245
9	4.362	5.197	6.122	5.936
10	.763	2.259	1.286	2.267
11	2.627	.232	4.363	.334
12	3.115	.973	3.741	1.434
13	28.436	41.756	23.938	32.593
14	8.094	11.917	6.878	9.369
15	.578	.465	.652	.449
16	.435	.350	.247	.256
17	.283	.236	.184	.181
18	2.765	2.351	1.284	1.361
19	1.015	.993	.980	.996
20	22.249	.000	25.557	20.461
21	1.532	1.577	1.381	1.357
22	389.035	430.782	415.714	473.774
23	1.409	2.205	1.000	2.000
24	160.983	175.735	171.111	174.039
25	3.012	2.853	3.012	2.853
PEOPLE	156.	65.	117.	782.