GENERALIZED FACTOR ANALYSIS

PART II

APPLICATIONS

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CHAPTER 11

THE DATA SETS

The methods developed in the previous chapters were applied to twelve different sets of data. These will now be described.

11.1 Primary Mental Abilities

Thurstone and Thurstone (1941) administered 60 tests to 710 eighth grade students. The intercorrelations analyzed were taken from nine of these tests. The first three of these were verbal tests, the next three spatial, and the last three numerical, as follows:

1. Sentences
2. Vocabulary
3. Completion
4. Flags
5. Figures
6. Cards
7. Addition
8. Multiplication
9. Three higher

11.2 Twenty-Four Psychological Tests

This set of correlations comes from a battery of twenty-four psychological tests given to 145 seventh and eighth grade school children in a suburb of Chicago. The initial data were gathered by Holzinger and Swineford (1939). The data have subsequently been analyzed by a number of investigators including Holzinger and Harmon (1941), Kaiser (1958), Neuhaus and Wrigley (1954), Harmon (1967), and others, so that the characteristics of the data have come to be well known. The tests are identified as follows:

1. Visual perception
2. Cubes
3. Paper form board
4. Flags
5. General information
6. Paragraph comprehension
7. Sentence completion
8. Word classification
9. Word meaning
10. Addition
11. Code
12. Counting
13. Straight-curved capitals
14. Word recognition
15. Number recognition
16. Figure recognition
17. Object-number
18. Number-figure
19. Figure-word
20. Deduction
21. Numerical puzzles
22. Problem reasoning
23. Series completion
24. Arithmetic problems

11.3 Thirty-Three Variable Speed Study

These data are from a study by Lord (1956) designed to investigate the speed factor. Tests were administered to 649 students in the entering class at the United States Naval Academy at Annapolis. The tests were designed to measure verbal, spatial, and arithmetic reasoning ability. In each area, seven tests were administered. One was the regular admissions examination denoted by (A). The remaining six were short experimental tests parallel in content but different in degree of speededness. Two designated (L) involved virtually no speed, one was moderately speeded (M), and the remaining three (S) were highly speeded. Six reference factor tests designated by (R) were also included. In addition, grades in six areas designated (G) were included as variables. The 33 variables are as follows:

1. Word fluency (R)
2. Verbal (A)
3. Vocabulary (L)
4. Vocabulary (L)
5. Vocabulary (M)
6. Vocabulary (S)
7. Vocabulary (S)
8. Vocabulary (S)
9. Spatial relations (A)
10. Intersections (L)
11. Intersections (L)
12. Intersections (M)
13. Intersections (S)
14. Intersections (S)
15. Intersections (S)
16. Mathematics (A)
17. Arithmetic reasoning (L)
18. Arithmetic reasoning (L)
19. Arithmetic reasoning (M)
20. Arithmetic reasoning (S)
21. Arithmetic reasoning (S)
22. Arithmetic reasoning (S)
23. Number speed (R)
24. Number speed (R)
25. Cancellation (R)
26. Picture discrimination (R)
27. Number checking (R)
28. English (G)
29. Foreign language (G)
30. Engineering drawing and descriptive geometry (G)
31. Chemistry (G)
32. Mathematics (G)
33. Conduct

11.4 Thurstone Twenty-Variable Box Problem

These data are from the classical study by Thurstone (1947) designed to illustrate the principle of simple structure. Measurements of a random collection of thirty boxes were made. The three dimensions X, Y, and Z were recorded for each box. A list of 26 arbitrary score functions was then prepared. Twenty of these functions were included as variables in our analysis. These are as follows:

1.	X	11.	Y^2Z
2.	Y	12.	YZ^2
3.	Z	13.	$2X + 2Y$
4.	XY	14.	$2X + 2Z$
5.	XZ	15.	$2Y + 2Z$
6.	YZ	16.	$\sqrt{X^2 + Y^2}$
7.	X^2Y	17.	$\sqrt{X^2 + Z^2}$
8.	XY^2	18.	$\sqrt{Y^2 + Z^2}$
9.	X^2Z	19.	XYZ
10.	XZ^2	20.	$\sqrt{X^2 + Y^2 + Z^2}$

11.5 Eight-Variable Body Type Measures

These data are from a study of eight physical variables by Mullen (1939). The data have been used for illustrative purposes by Harmon (1967) and by Kaiser and Caffrey (1965). The variables are as follows:

1. Height
2. Arm span
3. Length of forearm
4. Length of lower leg
5. Weight
6. Bitrochanteric diameter
7. Chest girth
8. Chest width

11.6 Twelve-Variable Anthropometric Measures

These data are from a factor analysis by Hammond (1942) involving twelve body measurements on adult men. Hammond attempted to interpret the resulting factor matrix without rotation of axes. Later Thurstone (1946) reanalyzed the data rotating to simple structure. The variables are as follows:

1.	Stature	7.	Chest depth
2.	Sitting height	8.	Head length
3.	Shoulder breadth	9.	Head breadth
4.	Hip breadth	10.	Head height
5.	Span	11.	Hand length
6.	Chest Breadth	12.	Hand breadth

11.7 Fifteen Variables from Hemmerle

These data are from a study by Hemmerle (1965) designed to illustrate a method for obtaining maximum likelihood estimates of factor loadings and communalities using an iterative computer procedure. Later the data were reanalyzed by methods developed by Jöreskog (1967) and by Horst (1968b). This data set was included because of the divergent results obtained by the several investigators. Hemmerle does not indicate the source of the data, the number of cases, nor the nature of the variables.

11.8 Seventeen-Variable Data from Bechtold--Sample 1

These data are from a study by Bechtold (1961) designed to investigate the factor analysis stability hypothesis. The data are a portion of those originally collected by Thurstone and Thurstone (1941). The study included seventeen variables from a sample of 212 cases. The first two variables were designed to measure memory (M), the next three verbal ability (V), and successive sets of three measure word fluency (W), spatial ability (S), number ability (N), and reasoning ability (R). The seventeen variables were given designations as follows:

1. First names (M)
2. Word-number (M)
3. Sentences (V)
4. Vocabulary (V)
5. Completion (V)
6. First letters (W)
7. Four-letter words (W)
8. Suffixes (W)
9. Flags (S)
10. Figures (S)
11. Cards (S)
12. Addition (N)
13. Multiplication (N)
14. Three higher (N)
15. Letter series (R)
16. Pedigrees (R)
17. Letter groupings (R)

11.9 Seventeen-Variable Data from Bechtold--Sample 2

These data are from the same study by Bechtold (1961) as those in Section 11.8. The variables are the same as in that data set but the cases are a separate sample of 213 cases. The two samples of cases were formed by assigning each of 425 cases alternately to one or the other of two groups after the cases were thoroughly randomized.

11.10 Nine-Variable Synthetic Data

The correlation matrix for this data set was derived from a configuration of points constructed so as to provide a severe test for the simple structure transformation procedure described in Chapter 9. A right spherical triangle was constructed on the surface of a sphere of unit radius. A point was located on each side of the triangle midway between the two vertices, or 45 degrees from each of the two vertices. Two more points were located on each side of the spherical triangle, one each midway between a vertex and the mid point, or 22.5 degrees from a vertex and the mid point. Thus the three points on the 90 degree arc of the great circle constituting a side of the triangle divided the side into four equal arcs of 22.5 degrees each. The cosines of the angular distances between all pairs of the nine points were calculated to obtain a correlation matrix. The cosines of the angular distances of each of the nine points with each of the three vertices of the right spherical triangle were also calculated. These values are the simple structure factor loadings of the variables (points). An adequate method of analysis of the correlation matrix including simple structure transformation should recover the synthetically constructed simple structure factor loadings.

11.11 Reading Comprehension Factors

These data are from a study by Davis (1944) designed to investigate the primary factors of reading comprehension. Tests were designed to measure nine different reading skills. The correlations are based on scores of 421 college freshman. The tests were as follows:

1. Knowledge of word meaning
2. Ability to select the appropriate meaning for a word or phrase in the light of its particular contextual setting
3. Ability to follow the organization of a passage and to identify antecedents and references to it
4. Ability to select the main thought in a passage
5. Ability to answer questions that are specifically answered in a passage
6. Ability to answer questions that are answered in a passage but not in words in which the question is asked
7. Ability to draw inferences from a passage about its contents
8. Ability to recognize the literary devices used in a passage and to determine its tone and mode
9. Ability to determine a writer's purpose, intent, and point of view, i.e., to draw inferences about a writer.

11.12 The Heywood Case

These data are from a five-variable synthetic example from Thomson (1950). The correlation matrix was constructed so that every tetrad difference is exactly zero, but the g factor saturation for one of the tests is greater than unity. However, the matrix is positive definite. This example was included to test the behavior of various scaling and loss function parameters described in Chapter 8 for the Heywood case. The loadings of the variables for the g factor were chosen as follows:

1. 1.05
2. .9
3. .8
4. .7
5. .6

CHAPTER 12

EXPERIMENTAL RESULTS

In this chapter we shall merely present the numerical results of the analyses for the twelve data sets. In Chapter 13 we shall discuss some of the more interesting of these results. At the end of this chapter the results are presented successively for each of the twelve data sets. For each data set six separate sets of analyses are presented. For the first group of three of these analyses the loss function parameter $P_W = 1$ was used and for the second group of three this parameter was $P_W = 0$. Within each group, the first set is for the scaling parameter $p = 0$, the second for $p = .5$, and the third for $p = 1.0$. The format for all sets of data is identical. It consists of a first line, a second line or sequence of lines, a third block of lines, and a final line. These we shall now interpret.

12.1 The First Line

The first line has three successive groups of numbers. The first group consists of six integers. The second consists of three figures. The third group has figures equal in number to the number of roots m of the correlation matrix greater than unity.

The six integers in the first group are as follows:

(1) The first integer is simply the arbitrary serial order of the data set.

(2) The second integer is the order of the correlation matrix or the number of variables n.

(3) The third integer is the number of factors solved for. This is the number of roots of the correlation matrix greater than unity. It is the same as the number of figures in the last group of the first line.

(4) The fourth integer is a code for the loss function parameter P_W. For $P_W = 1$ the integer is 1 and for $P_W = 0$ the integer is 2. Thus the integer 1 means that the loss function includes only the residual covariance elements, while the integer 2 means that it includes both the unit weighted residual variance and

covariance elements. It is possible, of course, to have P_W take any value between unity and zero but only the two extremes were used for all twelve data sets.

(5) The fifth integer is a code for the scaling function parameter p. For p = 0 the integer is 1, for p = .5 it is 2, and for p = 1.0 it is 3. Thus the integer 1 means that the scaling function is the square root reciprocal of the residual variance, the number 2 means that it is the square root residual of the total variance, and the number 3 means that it is the square root residual of the estimated or common variance. It is possible, of course, to let p take any value between zero and unity but only the three values indicated above were used for the twelve data sets.

(6) The sixth and final integer in this group is a code to indicate the row scaling treatment of the factor loading matrix prior to the simple structure procedures of Chapter 9. The integer 1 indicates that the factor loading matrix was normalized by rows prior to simple structure transformation; if it was not, the integer 2 is used to so indicate. The computer program provides for both options but in this study only the normalizing option was used for all sets of data. Hence for each of the six analyses for all twelve data sets, the last integer in the first group of six in the first row is always 1.

The three figures in the second group are as follows:

(1) The first figure in this group is the ratio of the sum of squares of the first m roots of the matrix for specified scaling and loss function parameters to the sum of squares of all the roots of this matrix. This is the criterion ϕ developed in Chapter 8 which it is desired to maximize. The maximum value it can attain is unity.

(2) The second figure in this group is the number of iterations required to reach the tolerance limits for the equality of two successive iterations for ϕ or the iteration limit, whichever is reached first.

(3) This figure is the time in minutes taken for the required number of iterations.

In the third group of m figures, m is the number of roots of the original correlation matrix greater than unity. The m figures in this group are the m largest roots of the matrix for the specified scaling and loss function parameters.

12.2 The Second Line or Sequence of Lines

The second line or sequence of lines consists of four numbers to a line. The numbers all have to do with the simple structure transformation described in Chapter 9. Since data sets 11 and 12 have only a single factor, no transformations were required, hence no lines of four numbers appear for these data sets. For data sets 1 through 9, no more than one or two lines are given. For data set 10, 20 lines of four numbers each are given. The four numbers of each line have the following interpretations:

(1) The first number is the quantity tr $(D\Delta)$ where D and Δ are defined in Eqs. 9.21 and 9.34. This value is calculated at each iteration for the simple structure transformation matrix. When these values for two successive iterations are within the specified tolerance limit, the iterations cease. An iteration limit is also specified in the computer program beyond which iterations cease even though the tolerance limit is not yet reached.

(2) The second number is the simple structure criterion Ψ given in Eq. 9.70. The maximum value this criterion can attain is unity.

(3) The third number is the number of sets of iterations taken to calculate the simple structure factor loading matrix for a given positive integer W used to calculate F in Eq. 9.58. This integer is 1 for the first set of iterations. If the number of negative factor loadings in any column is less than the number of factors, the computations cease. If not, the integer W is increased by 1 and a second set of iterations for the simple structure factor loading matrix occurs.

This procedure continues until at least one column of the simple structure factor loading matrix has fewer negatives than the number of factors or columns in the matrix. When this occurs, the simple structure matrix from the preceding set of iterations is taken as the final simple structure factor matrix, except for W = 1, in which case the corresponding simple structure factor loading matrix is accepted. A limit is put on the number of successive sets of iterations. If this limit is reached before the number of negative values in any column of the simple structure factor loading matrix is less than the number of factors, the successive sets of iterations cease.

(4) This number is the integer W. It indicates the number of sets of iterations calculated and is therefore the number of the line in the sequence of lines. The integer W serves as the argument for the power function in the numerator terms of the criterion function Ψ given by Eq. 9.70 and efined in more detail in preceding parts of Chapter 9.

12.3 The Factor Loading Lines

A set of n lines, where n is the number of variables, is given for each of the data sets. The columns in this set of lines are as follows:

(1) The first column gives simply the line numbers which indicate, of course, also the arbitrary serial numbers of the variables or tests described in Chapter 12.

(2) The second column has a 1 if the variable retains its original sign and -1 if its sign is reversed as discussed in Chapter 6, Section 4.

(3) The third column gives the communalities of the variables as calculated from the factor loading matrix calculated by the methods of Chapter 8.

(4) The fourth column gives the specificities corresponding to the communalities in the second column. The sum of corresponding elements of the two columns is therefore unity.

(5) The next block of m columns gives the factor loading matrix for m factors calculated by the methods of Chapter 8.

(6) The last block of m columns for data sets 1 through 10 gives the simple structure factor loading matrix calculated by the methods of Chapter 9. For data sets 11 and 12, this block of columns is omitted since only one factor loading vector was calculated for each set.

12.4 The Last Line

The last line for data sets 1 through 10 consists of m figures, where m is the number of factors solved for. Each value is the corresponding element of the Δ diagonal matrix defined in Eq. 9.34. These elements are the ratios whose average is given by Ψ in Eq. 9.70. It is the average of these ratios which is the second number in the second row or sequence of rows described in Section 12.2 This is the simple structure criterion we seek to maximize. The maximum value any one of these numbers can take is unity.

This final row of figures is not given for data sets 10 and 11, since only one factor vector was calculated for each.

DATA SET 1

1 3 3 1 1 1 1.000 24.000 0.050 14.634 6.171 3.232

1.069 0.959 11.000 1.000

1	1.	0.926	0.174	0.862	-0.257	-0.131	0.823	-0.035	0.014
2	1.	0.834	0.166	0.877	-0.233	-0.101	0.910	-0.019	0.050
3	1.	0.756	0.244	0.846	-0.056	-0.142	0.762	0.168	-0.017
4	1.	0.595	0.405	0.326	0.697	-0.060	0.000	0.724	0.117
5	1.	0.722	0.278	0.250	0.788	-0.193	-0.025	0.840	-0.014
6	1.	0.685	0.315	0.317	0.745	-0.182	0.034	0.807	0.003
7	1.	0.617	0.383	0.488	0.179	0.583	-0.005	0.059	0.698
8	1.	0.701	0.299	0.492	0.105	0.669	-0.015	-0.036	0.765
9	1.	0.500	0.500	0.542	0.252	0.379	0.115	0.219	0.511

0.975 0.951 0.553

1 9 3 1 2 1 1.000 15.000 0.067 3.455 1.763 1.016

1.068 0.959 14.000 1.000

1	1.	0.825	0.175	0.727	-0.465	-0.284	0.823	-0.035	0.013
2	1.	0.833	0.167	0.751	-0.450	-0.256	0.810	-0.020	0.047
3	1.	0.758	0.242	0.764	-0.260	-0.376	0.762	0.171	-0.016
4	1.	0.599	0.401	0.505	0.584	-0.059	0.001	0.725	0.122
5	1.	0.713	0.282	0.434	0.706	-0.177	-0.024	0.838	-0.016
6	1.	0.684	0.316	0.482	0.649	-0.174	0.030	0.807	0.006
7	1.	0.617	0.383	0.593	-0.028	0.515	-0.005	0.060	0.698
8	1.	0.698	0.302	0.583	-0.109	0.538	-0.016	-0.035	0.764
9	1.	0.503	0.497	0.641	0.064	0.297	0.115	0.223	0.512

0.974 0.349 0.952

1 9 3 1 3 1 0.999 10.000 0.050 5.037 2.481 1.482

1.068 0.958 18.000 1.000

1	1.	0.825	0.175	0.653	0.502	-0.383	0.823	-0.034	0.013
2	1.	0.832	0.168	0.680	0.433	-0.355	0.910	-0.021	0.046
3	1.	0.760	0.240	0.703	0.298	-0.410	0.762	0.172	-0.015
4	1.	0.693	0.307	0.553	-0.531	-0.059	0.001	0.727	0.125
5	1.	0.715	0.285	0.486	-0.675	-0.154	-0.024	0.837	-0.017
6	1.	0.687	0.313	0.521	-0.614	-0.153	0.030	0.806	0.007
7	1.	0.616	0.384	0.674	0.131	0.458	-0.005	0.061	0.697
8	1.	0.697	0.303	0.611	0.217	0.525	-0.016	-0.035	0.763
9	1.	0.504	0.496	0.566	0.023	0.246	0.115	0.225	0.512

1.574 1.549 0.551

DATA SET 1 (cont.)

1 9 3 2 1 1 1.000 16.000 0.050 2731.512 1939.882 1319.103

1.057 0.953 15.000 1.039

1	1.	0.649	0.311	0.616	-0.233	-0.506	0.036	-0.036	0.754
2	1.	0.699	0.301	0.733	-0.253	-0.631	0.014	-0.020	0.918
3	1.	0.627	0.373	0.620	-0.047	-0.493	-0.001	0.143	0.700
4	1.	0.422	0.578	0.372	0.531	0.036	0.097	0.613	0.005
5	1.	0.999	0.001	0.407	0.915	0.004	-0.015	0.991	-0.039
6	1.	0.510	0.490	0.351	0.671	-0.040	0.002	0.695	0.043
7	1.	0.444	0.556	0.609	-0.119	0.244	0.573	0.050	0.065
8	1.	0.997	0.001	0.319	-0.264	0.508	0.939	-0.037	-0.049
9	1.	0.370	0.630	0.559	0.013	0.106	0.426	0.178	0.153

0.944 0.954 0.551

1 9 2 2 2 1 0.963 4.000 0.033 3.749 2.050 1.331

1.046 0.363 15.000 1.300

1	1.	0.879	0.121	0.716	-0.493	-0.351	0.869	-0.036	0.017
2	1.	0.879	0.121	0.739	-0.478	-0.323	0.854	-0.021	0.052
3	1.	0.850	0.150	0.772	-0.296	-0.407	0.833	0.173	-0.023
4	1.	0.734	0.266	0.556	0.649	-0.067	-0.002	0.816	0.129
5	1.	0.801	0.199	0.444	0.744	-0.130	-0.074	0.889	-0.019
6	1.	0.785	0.215	0.518	0.693	-0.183	0.036	0.870	0.001
7	1.	0.762	0.238	0.641	-0.081	0.587	-0.017	0.051	0.806
8	1.	0.791	0.209	0.615	-0.169	0.621	-0.008	-0.044	0.932
9	1.	0.648	0.352	0.715	0.032	0.363	0.110	0.237	0.632

0.573 0.353 0.559

1 9 3 2 3 1 0.965 6.000 0.033 4.750 2.562 1.689

1.047 0.964 20.000 1.000
1.037 0.358 6.000 2.000

1	1.	0.877	0.123	0.662	0.498	0.436	0.867	-0.036	0.016
2	1.	0.877	0.123	0.667	0.488	0.409	0.953	-0.021	0.050
3	1.	0.852	0.148	0.726	0.304	0.479	0.334	0.171	-0.023
4	1.	0.744	0.256	0.502	-0.725	0.047	-0.003	0.822	0.128
5	1.	0.794	0.206	0.455	-0.726	0.144	-0.024	0.835	-0.019
6	1.	0.741	0.259	0.547	-0.675	0.150	0.037	0.868	-0.300
7	1.	0.752	0.248	0.642	0.170	-0.534	-0.018	0.043	0.801
8	1.	0.775	0.225	0.632	0.256	-0.557	-0.007	-0.044	0.922
9	1.	[illegible]	[illegible]	0.763	0.064	-0.330	0.104	0.237	0.651

[illegible] [illegible] [illegible]

DATA SET 2

2 24 5 1 1 1 0.591 53.000 0.167 19.172 5.460 3.101 1.930 1.309

0.234 0.597 60.000 1.000

1	1.	0.549	0.451	0.561	0.025	-0.462	0.138	0.026	0.013	0.237	0.536	0.053	0.035
2	1.	0.220	0.780	0.345	-0.032	-0.289	0.036	0.123	0.040	0.035	0.389	0.010	0.086
3	1.	0.361	0.639	0.377	-0.126	-0.435	0.109	0.029	0.024	0.156	0.463	0.031	-0.076
4	1.	0.351	0.649	0.462	-0.096	-0.300	0.109	0.162	0.142	0.081	0.452	-0.054	0.097
5	1.	0.644	0.356	0.726	-0.255	0.717	0.063	-0.013	0.660	0.276	0.014	0.010	0.100
6	1.	0.712	0.288	0.722	-0.381	0.158	0.002	-0.142	0.682	0.340	-0.015	0.131	-0.065
7	1.	0.772	0.228	0.722	-0.355	0.235	0.138	0.015	0.738	0.291	0.014	-0.077	0.050
8	1.	0.514	0.486	0.689	-0.153	0.327	0.100	0.065	0.477	0.225	0.200	-0.024	0.144
9	1.	0.738	0.262	0.726	-0.426	0.169	-0.020	-0.029	0.727	0.241	0.037	0.081	0.003
10	1.	0.783	0.217	0.512	0.599	0.396	-0.041	0.126	0.149	0.059	-0.093	0.009	0.644
11	1.	0.604	0.396	0.571	0.378	0.140	-0.079	-0.356	0.048	0.434	-0.065	0.364	0.102
12	1.	0.556	0.444	0.476	0.547	0.322	0.112	0.132	-0.052	0.124	0.199	-0.051	0.490
13	1.	0.752	0.248	0.629	0.351	-0.193	0.367	-0.214	0.006	0.586	0.225	-0.023	0.064
14	1.	0.366	0.634	0.403	0.011	-0.049	-0.363	-0.254	0.116	0.131	-0.002	0.506	-0.021
15	1.	0.286	0.714	0.356	0.022	-0.108	-0.364	-0.128	0.057	0.022	0.103	0.436	0.053
16	1.	0.457	0.543	0.456	0.034	-0.385	-0.298	-0.111	-0.051	0.074	0.359	0.445	0.010
17	1.	0.389	0.611	0.437	0.134	-0.033	-0.404	-0.121	0.076	0.023	0.070	0.471	0.162
18	1.	0.405	0.595	0.471	0.266	-0.211	-0.260	0.028	-0.064	-0.003	0.309	0.323	0.276
19	1.	0.236	0.764	0.417	0.063	-0.151	-0.179	-0.055	0.066	0.084	0.199	0.271	0.396
20	1.	0.479	0.521	0.592	-0.152	-0.170	-0.161	0.225	0.304	-0.071	0.410	0.115	0.236
21	1.	0.437	0.563	0.574	0.235	-0.149	-0.029	0.181	0.084	0.036	0.370	0.055	0.377
22	1.	0.413	0.587	0.585	-0.126	-0.168	-0.100	0.134	0.281	0.030	0.359	0.113	0.167
23	1.	0.558	0.442	0.563	-0.052	-0.211	-0.033	0.251	0.271	0.003	0.484	0.027	0.292
24	1.	0.524	0.476	0.659	0.186	0.139	-0.138	0.138	0.311	0.037	0.145	0.121	0.436

0.577 0.530 0.416 0.646 0.591

DATA SET 2 (cont.)

2 26 5 1 2 1 0.582 24.000 0.383 7.667 1.714 1.222 0.947 0.499

1.456 0.533 60.100 1.000

1	1.	0.5[illegible]	0.444	0.573	0.024	-0.345	0.204	-0.092	0.334	-0.010	0.483	0.045	0.082
2	1.	0.240	0.779	0.372	-0.045	-0.263	0.130	0.069	0.324	-0.020	0.213	-0.023	0.019
3	1.	0.354	0.664	0.429	-0.125	-0.369	0.116	-0.111	0.245	0.029	0.382	0.057	-0.110
4	1.	0.367	0.651	0.483	-0.112	-0.261	0.174	0.057	0.337	0.074	0.255	-0.055	0.006
5	1.	0.634	0.362	0.697	-0.293	0.278	0.046	-0.032	0.293	0.634	0.037	-0.003	0.119
6	1.	0.731	0.337	0.644	-0.401	0.212	-0.369	-0.139	0.232	0.637	0.078	0.121	-0.040
7	1.	0.727	0.273	0.677	-0.407	0.307	0.387	-0.033	0.304	0.714	0.018	-0.070	0.052
8	1.	0.512	0.449	0.674	-0.194	0.091	0.103	-0.034	0.319	0.443	0.165	-0.000	0.125
9	1.	0.740	0.260	0.695	-0.445	0.235	-0.065	-0.001	0.350	0.697	-0.037	0.061	-0.042
10	1.	0.781	0.219	0.477	0.543	0.475	0.094	0.167	0.159	0.115	-0.078	-0.010	0.831
11	1.	0.567	0.434	0.562	0.475	0.167	-0.090	-0.263	-0.056	0.150	0.288	0.323	0.497
12	1.	0.570	0.470	0.460	0.493	0.127	0.221	0.057	0.178	-0.062	0.295	-0.026	0.655
13	1.	0.744	0.774	0.510	0.306	-0.314	0.367	-0.388	-0.020	0.114	0.662	-0.002	0.471
14	1.	0.445	0.615	0.425	0.053	0.002	-0.427	-0.138	0.045	0.178	0.040	0.513	0.041
15	1.	0.274	0.734	0.387	0.042	-0.074	-0.368	-0.022	0.137	0.056	0.013	0.442	0.053
16	1.	0.453	0.541	0.510	0.076	-0.345	-0.273	-0.067	0.246	-0.046	0.242	0.434	-0.013
17	1.	0.611	0.333	0.464	0.196	0.004	-0.395	-0.016	0.139	0.030	-0.002	0.487	0.193
18	1.	0.622	0.576	0.513	0.327	-0.162	-0.141	0.045	0.294	-0.104	0.135	0.313	0.299
19	1.	0.743	0.747	0.442	0.391	-0.101	-0.137	-0.017	0.199	0.053	0.132	0.253	0.129
20	1.	0.474	0.522	0.616	-0.167	-0.141	-0.058	0.224	0.541	0.191	0.010	0.095	0.032
21	1.	0.453	0.547	0.566	0.210	-0.081	0.120	0.179	0.432	0.006	0.149	0.015	0.374
22	1.	0.415	0.585	0.606	-0.111	-0.113	-0.004	0.146	0.463	0.203	0.078	0.074	0.067
23	1.	0.564	0.452	0.697	-0.077	-0.154	0.090	0.141	0.545	0.171	0.141	0.014	0.143
24	1.	0.517	0.481	0.542	0.167	0.137	-0.014	0.168	0.375	0.232	-0.015	0.092	0.438

0.511 0.434 0.529 0.465 0.549

DATA SET 2 (cont.)

2 76 5 1 3 1 0.645 9.000 0.050 15.438 3.002 2.373 2.115 1.073

0.916 0.561 60.000 1.030

1	1.	0.538	0.464	0.621	-0.123	0.355	-0.082	-0.093	0.617	0.127	-0.003	0.041	0.172
2	1.	0.270	0.733	0.391	-0.144	0.261	-0.054	-0.160	0.485	0.041	0.007	0.083	-0.041
3	1.	0.347	0.411	0.446	-0.246	0.294	0.025	0.272	0.445	-0.095	0.027	-0.045	0.313
4	1.	0.734	0.464	0.452	-0.218	0.199	-0.081	0.012	0.468	0.037	0.123	-0.017	0.117
5	1.	0.635	0.365	0.554	-0.230	-0.371	-0.092	-0.092	0.176	0.137	0.645	0.063	-0.024
6	1.	0.663	0.327	0.653	-0.309	-0.370	0.057	-0.015	0.146	-0.021	0.666	0.127	0.068
7	1.	0.735	0.265	0.636	-0.338	-0.459	-0.112	0.032	0.114	0.072	0.752	-0.041	0.053
8	1.	0.519	0.491	0.455	-0.203	-0.178	-0.099	0.093	0.251	0.132	0.471	-0.019	0.176
9	1.	0.742	0.254	0.660	-0.346	-0.630	0.044	0.011	0.113	-0.034	0.734	0.393	0.077
10	1.	0.744	0.754	0.454	0.564	-0.272	-0.374	-0.083	-0.052	0.793	0.138	0.021	0.002
11	1.	0.482	0.518	0.553	0.400	-0.111	-0.063	-0.015	0.075	0.484	0.093	0.209	0.15[illegible]
12	1.	0.547	0.458	0.470	0.423	0.368	-0.362	-0.092	0.232	0.666	-0.045	-0.007	0.026
13	1.	0.534	0.596	0.601	0.165	0.173	-0.316	0.025	0.389	0.485	0.058	-0.071	0.150
14	1.	0.567	0.613	0.431	0.156	-0.137	0.382	-0.109	0.007	-0.004	0.153	0.506	0.097
15	1.	0.354	0.444	0.356	0.181	-0.072	0.364	-0.185	0.091	0.009	0.041	0.575	0.035
16	1.	0.497	0.513	0.565	0.047	0.737	0.327	-0.139	0.387	-0.040	-0.048	0.467	0.126
17	1.	0.472	0.528	0.476	0.305	-0.093	0.323	0.197	-0.073	0.122	0.062	0.365	0.404
18	1.	0.425	0.574	0.545	0.284	0.179	0.102	0.082	0.251	0.259	-0.103	0.253	0.305
19	1.	0.429	0.571	0.467	0.114	0.357	0.133	0.420	0.072	0.090	0.034	0.049	0.550
20	1.	0.469	0.531	0.626	-0.176	0.024	0.096	-0.192	0.416	0.013	0.281	0.267	-0.017
21	1.	0.447	0.554	0.610	0.122	0.130	-0.165	-0.104	0.418	0.366	0.066	0.100	0.062
22	1.	0.376	0.604	0.607	-0.143	0.017	0.012	0.041	0.324	0.066	0.266	0.076	0.214
23	1.	0.519	0.481	0.657	-0.143	0.083	-0.050	-0.042	0.471	0.133	0.257	0.105	0.120
24	1.	0.451	0.519	0.441	0.143	-0.153	-0.177	0.048	0.144	0.400	0.266	0.067	0.222

0.655 0.477 0.744 0.650 0.593

DATA SET 2 (cont.)

[illegible] 24 4 [illegible] 1 1 0.909 20.000 0.047 4253.236 1740.465 1175.011 1212.325 5.996

1. [illegible] 1.492 40.000 1.000

1	1.	[illegible]	[illegible]	0.311	-0.175	-0.065	-0.345	0.476	0.004	0.349	0.096	0.037	0.462
2	1.	0.215	0.764	0.234	-0.161	-0.024	-0.015	0.409	0.013	0.157	0.039	-0.018	0.401
3	1.	0.170	0.539	0.181	-0.265	-0.130	-0.038	0.439	-0.093	0.287	-0.011	0.029	0.434
4	1.	0.337	0.651	0.279	-0.222	[illegible]	0.175	0.404	0.073	0.223	-0.041	0.147	0.399
5	1.	0.516	0.465	0.521	-0.120	-0.217	0.104	0.240	0.111	0.036	0.219	0.492	0.203
6	1.	0.616	0.396	0.493	-0.224	-0.209	0.443	0.222	-0.032	-0.005	0.310	0.572	0.173
7	1.	1.097	0.031	0.586	-0.167	-0.522	.706	-0.302	0.042	0.015	0.168	0.919	-0.048
8	1.	0.514	0.494	0.507	-0.149	-0.264	0.217	0.200	0.126	0.128	0.138	0.433	0.262
9	1.	[illegible]	0.107	0.411	-0.222	-0.243	0.442	0.321	-0.016	-0.004	0.238	0.524	0.278
10	1.	[illegible]	0.061	0.768	0.033	-0.169	-1.115	-0.090	0.848	0.051	-0.009	0.093	0.009
11	1.	[illegible]	[illegible]	0.451	-0.320	[illegible]	0.169	-0.301	-0.026	0.123	0.775	-0.005	-0.063
12	1.	[illegible]	0.567	0.596	0.163	[illegible]	[illegible]	0.174	0.453	0.293	0.023	-0.020	0.134
13	1.	[illegible]	[illegible]	0.404	-0.413	[illegible]	-0.416	[illegible]	0.233	0.855	-0.002	0.050	0.012
14	1.	1.227	1.773	0.373	-0.153	0.139	0.176	0.260	-0.009	-0.007	0.284	0.087	0.237
15	1.	1.191	1.047	1.739	-0.176	0.051	0.117	0.344	0.044	-0.021	0.171	0.023	0.325
16	1.	[illegible]	0.521	0.312	-0.142	0.036	0.061	0.521	-0.003	0.119	0.139	-0.052	0.499
17	1.	0.233	0.778	0.367	0.071	0.070	0.152	0.322	0.119	-0.043	0.245	0.064	0.295
18	1.	[illegible]	[illegible]	0.405	0.323	[illegible]	-0.077	0.435	0.195	0.122	0.127	-0.066	0.424
19	1.	[illegible]	0.771	[illegible]	-0.071	0.022	[illegible]	0.332	0.064	0.093	0.159	0.051	0.313
20	1.	0.876	0.474	0.374	-0.125	-0.145	[illegible]	0.556	0.079	0.025	0.104	0.241	0.530
21	1.	0.423	0.577	[illegible]	0.104	[illegible]	[illegible]	[illegible]	0.253	0.181	0.127	0.073	0.362
22	1.	0.469	0.511	0.170	-0.159	-0.057	0.217	[illegible]	0.012	0.055	0.206	0.175	0.478
23	1.	0.972	0.364	0.077	-0.174	-0.146	0.376	0.663	0.183	0.169	0.335	0.131	0.628
24	1.	0.837	0.403	0.581	0.144	-0.116	0.154	0.325	0.355	0.037	0.153	0.233	0.303

[illegible] [illegible] [illegible] 0.625 0.696

DATA SET 2 (cont.)

2 24 * 2 1 1.623 4.000 0.333 8.1[illegible] 2.098 1.692 1.500 1.030

0.421 0.525 20.000 1.300

1	1.	0.603	0.397	0.616	-0.304	-0.432	-0.191	-0.004	0.004	0.133	0.680	0.054	0.300
2	1.	0.433	0.567	0.623	-0.082	-0.435	-0.185	-0.358	-0.023	0.031	0.685	0.129	-0.036
3	1.	0.577	0.423	0.445	-0.149	-0.479	-0.083	0.325	0.006	-0.132	0.498	-0.066	0.530
4	1.	0.451	0.549	0.511	-0.141	-0.339	-0.205	0.018	0.122	0.014	0.589	-0.043	0.220
5	1.	0.709	0.291	0.695	-0.319	0.335	-0.354	-0.082	0.729	0.138	0.237	0.057	-0.038
6	1.	0.779	0.221	0.691	-0.415	0.268	0.386	-0.013	0.743	-0.026	0.218	0.131	0.062
7	1.	0.770	0.230	0.677	-0.421	0.355	-0.077	0.028	0.794	0.066	0.197	-0.035	0.026
8	1.	0.585	0.415	0.595	-0.242	0.141	-0.107	0.111	0.550	0.147	0.304	-0.029	0.199
9	1.	0.776	0.224	0.595	-0.444	0.294	0.079	0.010	0.782	-0.038	0.202	0.105	0.067
10	1.	0.763	0.237	0.674	0.542	0.433	-0.717	-0.071	0.157	0.814	-0.035	0.026	-0.017
11	1.	0.565	0.434	0.577	0.435	0.294	0.376	-0.019	0.125	0.572	0.083	0.242	0.174
12	1.	0.677	0.323	0.681	0.547	0.117	-0.346	-0.109	-0.051	0.771	0.245	-0.023	0.060
13	1.	0.506	0.494	0.619	0.277	-0.045	-0.341	0.032	0.072	0.563	0.425	-0.093	0.208
14	1.	0.559	0.441	0.448	0.387	0.366	0.560	-0.178	0.199	-0.016	0.028	0.669	0.107
15	1.	0.578	0.422	0.407	0.157	-0.054	0.529	-0.323	0.066	-0.003	0.143	0.721	0.019
16	1.	0.595	0.405	0.534	0.292	-0.336	0.366	-0.145	-0.052	-0.045	0.458	0.571	0.238
17	1.	0.605	0.395	0.654	0.279	[illegible]	0.466	0.262	0.090	0.160	-0.098	0.461	0.501
18	1.	0.522	0.478	0.544	0.186	-0.197	0.153	0.172	-0.120	0.322	0.250	0.325	0.442
19	1.	0.676	0.324	0.676	0.134	-0.119	0.192	0.616	0.046	0.108	0.016	0.076	0.773
20	1.	0.540	0.460	0.643	-0.186	-0.111	0.376	-0.767	0.330	0.002	0.514	0.313	0.015
21	1.	0.514	0.486	0.622	0.230	-0.136	-0.202	-0.149	0.(0	0.440	0.440	0.113	0.104
22	1.	0.656	0.344	0.674	-0.155	-0.104	0.007	0.127	0. 5	0.053	0.377	0.093	0.317
23	1.	0.553	0.447	0.712	-0.104	-0.151	-0.098	-0.057	0.290	0.152	0.540	0.119	0.195
24	1.	0.562	0.438	0.671	0.196	0.230	-0.069	0.115	0.326	0.475	0.146	0.079	0.247

0.700 0.658 0.576 0.629 0.543

DATA SET 2 (cont.)

2 24 5 2 3 1 0.923 10.000 0.033 13.612 3.316 2.534 2.754 1.784

0.783 0.597 60.000 1.000

1	1.	0.572	0.408	0.629	-0.142	0.084	-0.410	0.020	0.002	0.149	0.067	0.672	0.314
2	1.	0.551	0.449	0.413	-0.204	0.063	-0.390	-0.427	-0.034	0.055	0.215	0.687	-0.116
3	1.	0.556	0.344	0.453	-0.326	-0.058	-0.375	0.308	0.007	-0.146	-0.045	0.527	0.485
4	1.	0.457	0.503	0.527	-0.323	0.118	-0.307	0.033	0.113	0.005	-0.067	0.632	0.247
5	1.	0.652	0.308	0.670	-0.217	0.098	0.419	-0.105	0.724	0.134	0.070	0.316	-0.057
6	1.	0.704	0.236	0.665	-0.301	-0.047	0.409	-0.027	0.734	-0.024	0.129	0.303	0.045
7	1.	0.747	0.253	0.650	-0.315	0.116	0.461	0.015	0.785	0.060	-0.032	0.298	-0.011
8	1.	0.593	0.407	0.684	-0.221	0.119	0.227	0.106	0.570	0.131	-0.033	0.375	0.163
9	1.	0.753	0.247	0.670	-0.328	-0.036	0.443	0.007	0.773	-0.036	0.097	0.293	0.052
10	1.	0.723	0.277	0.463	0.570	0.358	0.220	-0.080	0.181	0.786	0.009	-0.013	-0.006
11	1.	0.583	0.417	0.574	0.485	0.034	0.103	-0.031	0.146	0.587	0.219	0.073	0.199
12	1.	0.644	0.356	0.484	0.482	0.400	-0.093	-0.098	-0.023	0.753	-0.022	0.222	0.058
13	1.	0.592	0.408	0.520	0.206	0.371	-0.166	0.018	0.079	0.574	-0.085	0.433	0.181
14	1.	0.574	0.426	0.448	0.191	-0.524	0.184	-0.167	0.234	-0.027	0.659	-0.007	0.204
15	1.	0.575	0.425	0.409	0.222	-0.521	0.012	-0.294	0.072	-0.009	0.720	0.087	0.153
16	1.	0.586	0.414	0.549	0.040	-0.414	-0.293	-0.161	-0.040	-0.039	0.573	0.409	0.331
17	1.	0.606	0.394	0.489	0.340	-0.391	0.035	0.301	0.103	0.139	0.391	-0.102	0.587
18	1.	0.549	0.451	0.558	0.354	-0.151	-0.263	0.142	-0.128	0.328	0.306	0.224	0.513
19	1.	0.601	0.399	0.482	0.133	-0.170	-0.081	0.561	0.052	0.109	0.045	0.059	0.717
20	1.	0.551	0.449	0.650	-0.213	-0.133	-0.004	-0.251	0.364	-0.010	0.335	0.525	0.050
21	1.	0.540	0.460	0.635	0.163	0.212	-0.177	-0.192	0.090	0.465	0.128	0.489	0.089
22	1.	0.488	0.512	0.648	-0.197	-0.028	-0.002	0.166	0.348	0.039	0.064	0.418	0.332
23	1.	0.558	0.442	0.719	-0.171	0.049	-0.074	-0.063	0.324	0.145	0.135	0.569	0.180
24	1.	0.567	0.433	0.669	0.230	0.156	0.183	0.088	0.353	0.473	0.061	0.190	0.225

0.633 0.646 0.576 0.579 0.544

DATA SET 2

3 33 6 1 1 1 0.999 20.000 0.150 36.484 19.459 9.413 4.443 3.601 1.102

0.752 0.536 60.000 1.000
0.736 0.509 53.000 2.000

1	1.	0.139	0.912	0.343	-0.145	0.100	0.068	0.168	-0.082	0.202	0.063	0.248	0.027	0.239	0.043
2	1.	0.799	0.201	0.676	-0.472	-0.239	0.005	-0.171	-0.131	0.394	0.002	0.597	0.093	-0.082	-0.009
3	1.	0.658	0.342	0.563	-0.479	-0.249	0.021	-0.105	-0.136	0.420	-0.019	0.537	0.041	-0.058	-0.063
4	1.	0.675	0.325	0.639	-0.430	-0.244	0.085	-0.138	-0.037	0.440	0.016	0.559	0.000	-0.110	0.031
5	1.	0.754	0.246	0.627	-0.525	-0.231	0.028	-0.082	-0.158	0.453	-0.024	0.583	0.045	-0.022	-0.078
6	1.	0.701	0.299	0.683	-0.431	-0.153	0.040	0.120	0.097	0.635	0.051	0.411	-0.006	0.091	0.050
7	1.	0.874	0.126	0.707	-0.563	-0.146	0.053	0.156	0.093	0.718	-0.017	0.479	-0.017	0.131	-0.019
8	1.	0.827	0.163	0.693	-0.530	-0.116	0.012	0.179	0.176	0.741	-0.026	0.386	0.007	0.137	0.020
9	1.	0.406	0.594	0.476	0.384	-0.142	-0.105	0.016	-0.017	0.021	0.493	-0.012	0.131	0.023	0.344
10	1.	0.657	0.343	0.555	0.542	-0.211	0.025	-0.014	-0.099	-0.045	0.684	0.088	0.033	-0.020	0.447
11	1.	0.728	0.272	0.530	0.614	-0.250	0.030	0.026	-0.090	-0.051	0.753	0.036	-0.005	-0.015	0.451
12	1.	0.767	0.233	0.576	0.601	-0.272	0.003	-0.016	0.009	0.013	0.733	0.008	0.015	-0.078	0.504
13	1.	0.759	0.241	0.579	0.591	-0.251	0.001	0.103	-0.010	0.047	0.768	-0.002	-0.003	0.035	0.454
14	1.	0.805	0.195	0.561	0.627	-0.248	-0.015	0.116	-0.011	0.035	0.807	-0.035	-0.012	0.032	0.442
15	1.	0.814	0.186	0.593	0.632	-0.222	-0.053	0.118	-0.001	0.013	0.799	-0.062	0.050	0.065	0.477
16	1.	0.645	0.355	0.620	0.015	0.277	-0.364	-0.222	-0.033	-0.008	-0.003	0.077	0.613	0.074	0.406
17	1.	0.531	0.469	0.589	0.095	0.195	-0.216	-0.297	0.045	0.005	0.048	0.103	0.464	-0.078	0.495
18	1.	0.542	0.458	0.539	0.099	0.255	-0.221	-0.266	-0.002	-0.032	0.046	0.115	0.494	-0.011	0.486
19	1.	0.620	0.330	0.617	0.052	0.216	-0.356	-0.243	0.066	0.043	0.024	0.023	0.576	-0.002	0.450
20	1.	0.670	0.330	0.537	0.049	0.241	-0.401	-0.102	0.109	0.106	0.041	-0.045	0.602	0.135	0.434
21	1.	0.589	0.411	0.635	0.090	0.247	-0.303	-0.123	0.104	0.103	0.079	0.010	0.514	0.083	0.465
22	1.	0.597	0.403	0.613	-0.013	0.233	-0.362	-0.087	0.059	0.104	0.011	0.019	0.569	0.161	0.370
23	1.	0.625	0.375	0.238	-0.113	0.539	-0.190	0.420	-0.226	-0.010	-0.043	0.043	0.363	0.704	-0.046
24	1.	0.644	0.356	0.274	-0.037	0.567	-0.301	0.343	-0.179	-0.039	-0.069	-0.033	0.489	0.659	0.023
25	1.	0.307	0.693	0.259	-0.028	0.248	-0.002	0.421	-0.005	0.199	0.129	0.022	0.055	0.430	0.033
26	1.	0.353	0.641	0.355	0.098	0.033	-0.036	0.452	0.008	0.241	0.323	-0.010	0.023	0.459	0.070
27	1.	0.425	0.575	0.120	-0.040	0.423	-0.031	0.473	-0.065	0.078	0.021	-0.023	0.121	0.603	-0.028
28	1.	0.566	0.434	0.560	-0.354	0.109	0.270	-0.102	-0.093	0.310	-0.076	0.616	-0.012	0.024	0.145
29	1.	0.372	0.628	0.368	-0.029	0.325	0.338	-0.054	-0.119	0.022	0.006	0.436	-0.024	0.119	0.325
30	1.	0.652	0.348	0.511	0.423	0.032	0.276	0.046	0.032	0.117	0.495	0.293	-0.070	0.053	0.631
31	1.	0.816	0.184	0.601	0.177	0.476	0.416	-0.146	0.042	0.032	0.037	0.434	0.033	0.049	0.721
32	1.	0.815	0.185	0.572	0.215	0.583	0.312	-0.058	-0.006	-0.039	0.101	0.350	0.143	0.196	0.689
33	1.	0.052	0.948	0.046	0.084	0.149	0.057	-0.053	0.117	-0.014	-0.030	-0.030	0.029	-0.031	0.202

0.514 0.552 0.316 0.528 0.384 0.521

DATA SET 3 (cont.)

3 33 6 1 2 1 0.598 16.000 0.133 0.932 4.498 2.777 1.533 1.255 0.342

0.375 0.620 59.000 1.000

1	1.	0.207	0.793	0.323	-0.178	0.077	0.194	-0.025	-0.139	0.238	0.076	0.234	-0.013	0.200	0.014
2	1.	0.767	0.233	0.620	-0.495	-0.363	-0.041	0.007	-0.062	0.743	-0.007	-0.017	0.159	0.111	0.015
3	1.	0.658	0.342	0.524	-0.497	-0.353	-0.007	-0.021	-0.107	0.702	-0.020	-0.016	0.098	0.102	-0.029
4	1.	0.676	0.324	0.574	-0.454	-0.368	0.016	0.065	-0.032	0.723	0.009	-0.075	0.080	0.146	0.053
5	1.	0.735	0.265	[illegible]	-0.542	-0.344	0.024	-0.021	-0.074	0.758	-0.040	-0.002	0.092	0.103	0.021
6	1.	0.695	0.305	0.525	-0.452	-0.228	0.159	-0.101	0.108	0.734	0.021	0.077	0.073	0.027	0.255
7	1.	0.854	0.146	0.639	-0.584	-0.223	0.191	-0.104	0.072	0.830	-0.049	0.105	0.048	0.051	0.240
8	1.	0.773	0.227	0.629	-0.543	-0.180	0.166	-0.121	0.119	0.775	-0.057	0.129	0.087	0.011	0.275
9	1.	0.413	0.587	0.496	0.369	-0.124	-0.010	-0.107	0.066	0.018	0.494	0.056	0.203	0.002	0.124
10	1.	0.660	0.340	0.573	0.519	-0.212	0.060	-0.008	-0.116	-0.021	0.718	0.008	0.114	0.206	-0.015
11	1.	0.734	0.266	0.550	0.593	-0.234	0.098	-0.033	-0.079	-0.056	0.783	-0.026	0.077	0.175	0.024
12	1.	0.777	0.223	0.592	0.589	-0.269	0.037	-0.034	0.002	-0.016	0.760	-0.061	0.140	0.118	0.080
13	1.	0.760	0.240	0.592	0.573	-0.225	0.122	-0.104	-0.072	-0.020	0.794	0.026	0.093	0.137	0.048
14	1.	0.793	0.207	0.572	0.612	-0.244	0.116	-0.125	-0.057	-0.042	0.819	0.005	0.090	0.106	0.054
15	1.	0.901	0.139	0.601	0.616	-0.177	0.091	-0.134	-0.049	-0.074	0.801	0.069	0.146	0.103	0.063
16	1.	0.639	0.361	0.668	-0.046	0.220	-0.366	-0.080	0.025	0.078	0.027	0.430	0.656	-0.003	0.029
17	1.	0.526	0.474	0.627	0.035	0.107	-0.339	0.065	0.024	0.076	0.093	0.258	0.550	0.092	0.019
18	1.	0.547	0.453	0.621	0.034	0.167	-0.331	0.060	-0.077	0.030	0.105	0.337	0.556	0.152	-0.064
19	1.	0.619	0.381	0.664	-0.010	0.161	-0.380	-0.064	0.066	0.087	0.054	0.360	0.647	-0.024	0.055
20	1.	0.659	0.341	0.682	-0.016	0.254	-0.327	-0.140	0.055	0.061	0.059	0.474	0.655	-0.042	0.076
21	1.	0.591	0.409	0.677	0.019	0.210	-0.269	-0.080	0.097	0.084	0.095	0.395	0.582	-0.006	0.129
22	1.	0.594	0.406	0.655	-0.078	0.252	-0.283	-0.121	0.073	0.100	0.023	0.470	0.600	-0.007	0.060
23	1.	0.627	0.373	0.279	-0.187	0.610	0.190	-0.224	-0.235	-0.079	-0.071	0.747	0.168	0.154	-0.034
24	1.	0.609	0.391	0.326	-0.159	0.630	0.057	-0.235	-0.144	-0.110	-0.106	0.757	0.314	0.067	0.011
25	1.	0.342	0.658	0.274	-0.063	0.218	0.352	-0.189	0.049	0.090	0.067	0.401	-0.041	0.052	0.253
26	1.	0.437	0.563	0.368	0.078	0.191	0.384	-0.299	0.149	0.124	0.271	0.336	-0.034	-0.059	0.356
27	1.	0.476	0.524	0.151	-0.085	0.516	0.360	-0.205	0.071	-0.036	-0.047	0.512	-0.031	0.015	0.291
28	1.	0.599	0.401	0.553	-0.406	-0.047	0.141	0.325	-0.031	0.556	-0.074	0.048	0.003	0.415	0.124
29	1.	0.405	0.595	0.374	-0.094	0.203	0.183	0.415	-0.096	0.145	0.020	0.134	-0.050	0.529	0.063
30	1.	0.718	0.282	0.633	0.390	0.027	0.248	0.237	0.217	0.087	0.498	0.015	0.019	0.314	0.391
31	1.	0.761	0.239	0.621	0.088	0.287	0.133	0.517	0.010	0.084	0.155	0.188	0.107	0.610	0.188
32	1.	0.792	0.208	0.609	0.119	0.441	0.129	0.440	-0.040	-0.034	0.147	0.349	0.161	0.595	0.154
33	1.	0.096	0.904	0.064	0.073	0.125	-0.022	0.164	0.207	-0.055	-0.052	-0.022	0.059	0.040	0.201

0.715 0.759 0.538 0.592 0.593 0.633

DATA SET 3 (cont.)

3 23 6 1 3 1 0.997 10.000 0.033 15.718 6.471 4.678 2.880 2.181 1.067

0.957 0.753 44.000 1.000
0.539 0.483 48.000 2.000

1	1.	0.222	0.778	0.346	-0.155	0.074	-0.182	-0.208	0.158	0.222	0.053	0.238	-0.002	0.137	-0.101
2	1.	0.765	0.235	0.604	-0.435	-0.455	-0.027	0.024	-0.022	0.746	-0.004	-0.042	0.101	0.024	0.027
3	1.	0.641	0.359	0.505	-0.433	-0.432	-0.055	0.052	0.015	0.699	-0.032	-0.028	0.061	0.004	-0.027
4	1.	0.679	0.321	0.557	-0.402	-0.446	-0.066	-0.051	-0.032	0.719	0.012	-0.061	0.024	0.077	0.063
5	1.	0.725	0.275	0.547	-0.487	-0.423	-0.081	0.035	-0.035	0.761	-0.041	0.013	0.047	0.008	0.029
6	1.	0.681	0.319	0.616	-0.413	-0.271	-0.197	0.073	-0.193	0.720	0.081	0.203	0.023	-0.007	0.097
7	1.	0.850	0.150	0.636	-0.549	-0.231	-0.227	0.065	-0.102	0.822	0.002	0.240	0.001	0.009	0.094
8	1.	0.764	0.236	0.625	-0.510	-0.231	-0.193	0.077	-0.128	0.763	0.004	0.253	0.039	-0.010	0.118
9	1.	0.418	0.582	0.478	0.338	-0.105	-0.048	0.093	-0.195	0.033	0.538	0.039	0.142	-0.037	0.087
10	1.	0.648	0.352	0.549	0.541	-0.169	-0.134	-0.003	0.094	-0.012	0.705	-0.038	0.353	0.138	-0.032
11	1.	0.733	0.267	0.525	0.625	-0.173	-0.183	0.005	0.149	-0.042	0.786	-0.029	0.006	0.112	-0.008
12	1.	0.775	0.225	0.561	0.628	-0.223	-0.122	0.020	-0.021	-0.005	0.786	-0.068	0.059	0.060	0.049
13	1.	0.754	0.246	0.568	0.595	-0.159	-0.214	0.067	0.037	-0.001	0.802	0.040	0.023	0.070	-0.019
14	1.	0.778	0.222	0.542	0.637	-0.172	-0.207	0.082	-0.003	-0.020	0.825	0.026	0.021	0.030	0.007
15	1.	0.788	0.212	0.576	0.637	-0.111	-0.172	0.093	-0.006	-0.052	0.812	0.060	0.079	0.034	0.015
16	1.	0.639	0.361	0.681	-0.023	0.098	0.370	0.167	0.006	0.069	0.060	0.096	0.633	-0.001	0.011
17	1.	0.521	0.479	0.628	0.059	-0.007	0.346	0.024	0.052	0.053	0.112	-0.054	0.515	0.110	0.016
18	1.	0.554	0.446	0.636	0.050	0.048	0.355	0.030	0.133	0.006	0.091	-0.030	0.545	0.154	-0.054
19	1.	0.613	0.387	0.670	0.016	0.043	0.373	0.152	0.305	0.071	0.091	0.042	0.613	-0.001	0.012
20	1.	0.652	0.341	0.694	-0.002	0.145	0.344	0.190	-0.047	0.060	0.091	0.158	0.633	-0.023	0.054
21	1.	0.584	0.416	0.686	0.035	0.116	0.283	0.122	-0.060	0.075	0.143	0.136	0.547	0.016	0.099
22	1.	0.595	0.405	0.679	-0.069	0.147	0.305	0.158	-0.038	0.102	0.046	0.174	0.581	-0.003	0.056
23	1.	0.547	0.453	0.327	-0.252	0.591	-0.079	0.125	0.066	-0.047	-0.116	0.598	0.239	0.114	-0.029
24	1.	0.569	0.431	0.371	-0.?16	0.595	0.054	0.162	-0.026	-0.077	-0.129	0.562	0.373	0.037	0.046
25	1.	0.359	0.641	0.306	-0. 13	0.379	-0.317	0.089	0.017	0.079	0.134	0.545	-0.027	0.096	0.004
26	1.	0.437	0.563	0.389	[illegible]	0.281	-0.394	0.183	-0.126	0.133	0.359	0.569	-0.050	-0.045	0.091
27	1.	0.488	0.512	0.193	[illegible]	0.580	-0.266	0.091	-0.116	-0.033	0.009	0.654	0.013	0.039	0.129
28	1.	0.631	0.369	0.561	[illegible]	-0.129	-0.062	-0.372	0.006	0.526	-0.080	0.010	-0.028	0.418	0.194
29	1.	0.411	0.589	0.387	[illegible]	0.157	-0.029	-0.469	0.048	0.112	-0.016	0.037	-0.035	0.527	0.209
30	1.	0.670	0.330	0.623	0.3?3	0.051	-0.184	-0.287	-0.095	0.045	0.580	0.096	-0.034	0.349	0.274
31	1.	0.743	0.257	0.632	0.067	0.213	0.040	-0.513	0.169	-0.000	0.158	0.018	0.110	0.677	0.152
32	1.	0.774	0.226	0.627	0.083	0.374	0.070	-0.452	0.155	-0.107	0.135	0.130	0.192	0.645	0.153
33	1.	0.356	0.644	0.067	0.091	0.119	0.144	-0.274	-0.482	-0.020	-0.012	-0.033	0.032	0.020	0.570

0.843 0.831 0.709 0.833 0.706 0.626

DATA SET 3 (cont.)

3 33 6 2 1 1 1.000 13.000 0.117 3797.592 1959.451 1613.779 605.969 24.198 6.961

0.218 0.646 50.000 1.000

1	1.	0.171	0.329	0.392	0.080	0.072	0.018	0.019	-0.063	0.203	0.103	0.195	0.130	0.048	-0.030
2	1.	0.999	0.001	0.807	-0.431	-0.132	-0.381	-0.002	-0.001	0.867	-0.037	-0.037	-0.006	0.021	0.017
3	1.	0.564	0.436	0.653	-0.354	-0.069	-0.082	-0.014	0.016	0.541	-0.036	-0.050	0.204	-0.020	0.027
4	1.	0.578	0.422	0.672	-0.321	-0.142	-0.056	0.017	0.007	0.538	0.027	-0.093	0.219	0.020	0.024
5	1.	0.676	0.324	0.725	-0.367	-0.050	-0.105	-0.033	-0.001	0.604	-0.032	-0.018	0.211	-0.029	0.010
6	1.	0.625	0.375	0.734	-0.262	-0.035	0.114	0.057	-0.003	0.421	0.016	0.007	0.392	0.044	0.030
7	1.	0.778	0.222	0.815	-0.305	0.035	0.137	-0.019	-0.020	0.463	-0.006	0.056	0.454	-0.025	0.004
8	1.	0.999	0.001	0.855	-0.337	0.076	0.385	-0.000	-0.000	0.310	-0.032	0.035	0.704	-0.037	0.026
9	1.	0.415	0.585	0.221	0.076	-0.138	-0.039	0.581	0.036	0.067	-0.016	0.022	0.025	0.523	0.162
10	1.	0.660	0.340	0.211	0.125	-0.265	-0.063	0.721	-0.074	0.061	0.061	-0.027	-0.011	0.712	0.078
11	1.	0.740	0.260	0.175	0.133	-0.277	-0.042	0.772	-0.132	0.011	0.059	-0.031	-0.001	0.782	0.030
12	1.	0.783	0.217	0.207	0.100	-0.300	-0.009	0.796	-0.081	0.015	0.046	-0.071	0.044	0.779	0.082
13	1.	0.794	0.206	0.229	0.136	-0.236	0.008	0.803	-0.151	-0.005	0.046	0.013	0.068	0.813	0.021
14	1.	0.867	0.133	0.195	0.122	-0.225	-0.012	0.855	-0.182	-0.026	0.008	0.023	0.049	0.871	0.000
15	1.	0.866	0.134	0.211	0.158	-0.212	0.008	0.860	-0.110	-0.034	0.015	0.036	0.060	0.844	0.075
16	1.	0.726	0.274	0.503	0.115	-0.021	-0.145	0.278	0.601	0.387	0.003	0.089	-0.034	0.007	0.674
17	1.	0.551	0.449	0.438	0.157	-0.147	-0.097	0.289	0.468	0.323	0.115	0.004	-0.026	0.086	0.540
18	1.	0.559	0.441	0.451	0.184	-0.039	-0.072	0.283	0.475	0.302	0.109	0.050	-0.002	0.074	0.550
19	1.	0.694	0.306	0.473	0.102	-0.080	-0.041	0.313	0.595	0.302	0.021	0.012	0.050	0.038	0.670
20	1.	0.729	0.271	0.507	0.156	0.046	-0.001	0.339	0.575	0.256	-0.014	0.146	0.100	0.061	0.655
21	1.	0.630	0.370	0.484	0.169	-0.055	-0.014	0.333	0.503	0.267	0.064	0.076	0.071	0.098	0.588
22	1.	0.634	0.366	0.518	0.135	0.062	-0.036	0.274	0.517	0.297	-0.007	0.163	0.079	0.028	0.597
23	1.	0.999	0.001	0.409	0.496	0.760	-0.092	0.001	-0.001	0.102	-0.052	0.951	0.000	-0.022	0.081
24	1.	0.514	0.486	0.330	0.352	0.445	0.013	0.026	0.293	0.073	-0.020	0.540	0.055	-0.116	0.341
25	1.	0.175	0.825	0.268	0.187	0.207	0.133	0.085	-0.025	-0.008	0.045	0.297	0.184	0.077	0.024
26	1.	0.238	0.762	0.298	0.143	0.163	0.085	0.279	-0.117	0.011	-0.002	0.300	0.172	0.294	-0.029
27	1.	0.222	0.778	0.175	0.292	0.310	0.096	-0.027	0.015	-0.052	0.056	0.396	0.100	-0.042	0.046
28	1.	0.467	0.533	0.557	-0.001	-0.146	-0.028	-0.119	0.014	0.496	0.280	0.016	0.152	-0.036	0.017
29	1.	0.276	0.724	0.400	0.307	-0.124	-0.008	-0.064	-0.046	0.257	0.399	0.118	0.023	0.002	-0.028
30	1.	0.610	0.390	0.392	0.344	-0.321	0.068	0.467	-0.110	0.120	0.382	0.014	0.090	0.516	0.008
31	1.	0.999	0.001	0.586	0.677	-0.444	0.024	-0.006	-0.001	0.360	0.855	0.040	-0.021	0.087	0.041
32	1.	0.701	0.299	0.498	0.617	-0.218	0.022	0.104	0.116	0.250	0.602	0.173	-0.009	0.107	0.179
33	1.	0.031	0.969	0.013	0.124	-0.073	0.046	0.013	0.031	-0.023	0.113	-0.030	0.001	-0.017	0.094

1.547 0.509 0.632 0.549 0.838 0.653

DATA SET 3 (cont.)

3 33 5 [illegible] 2 1 0.9[illegible] 4.000 0.050 10.265 4.774 3.145 1.982 1.657 1.024

0.740 0.547 60.000 1.000
0.627 0.532 26.000 2.000

1	1.	0.442	0.558	0.356	0.208	0.097	0.281	-0.009	0.428	0.294	0.077	0.301	-0.020	0.302	-0.097
2	1.	0.787	0.213	0.623	0.501	-0.393	-0.019	-0.013	-0.016	0.770	-0.002	-0.074	0.068	0.048	0.435
3	1.	0.700	0.300	0.532	0.515	-0.336	0.015	-0.044	0.017	0.755	-0.025	-0.056	0.021	-0.012	0.387
4	1.	0.722	0.279	0.582	0.463	-0.398	0.032	0.059	-0.027	0.756	0.017	-0.097	-0.015	0.065	0.459
5	1.	0.765	0.235	0.567	0.553	-0.365	0.044	-0.032	-0.027	0.799	-0.026	-0.019	0.019	-0.018	0.451
6	1.	0.730	0.270	0.633	0.466	-0.243	0.184	-0.095	-0.036	0.765	0.116	0.173	0.015	0.002	0.484
7	1.	0.449	0.151	0.637	0.581	-0.231	0.198	-0.033	-0.072	0.839	0.037	0.196	0.013	-0.019	0.513
8	1.	0.789	0.211	0.621	0.550	-0.188	0.180	-0.102	-0.102	0.731	0.042	0.217	0.043	-0.023	0.504
9	1.	1.494	0.506	0.516	-0.411	-0.143	0.016	-0.138	-0.139	0.028	0.570	0.035	0.129	0.258	0.034
10	1.	[illegible]	0.302	0.582	-0.544	-0.222	0.089	-0.006	0.080	0.005	0.693	-0.044	0.014	0.499	-0.024
11	1.	0.764	0.236	0.554	-0.619	-0.236	0.127	-0.023	0.042	-0.030	0.764	-0.034	-0.023	0.470	-0.023
12	1.	0.756	0.204	0.594	-0.604	-0.270	0.064	-0.031	-0.016	-0.004	0.753	-0.078	0.013	0.452	0.026
13	1.	0.782	0.218	0.595	-0.583	-0.223	0.154	-0.090	0.032	0.014	0.785	0.033	-0.004	0.439	-0.011
14	1.	0.805	0.195	0.572	-0.623	-0.239	0.146	-0.107	-0.001	-0.010	0.303	0.020	-0.010	0.413	-0.010
15	1.	0.811	0.189	0.602	-0.626	-0.171	0.113	-0.115	-0.004	-0.043	0.792	0.054	0.055	0.442	-0.021
16	1.	0.695	0.315	0.683	0.046	0.212	-0.391	-0.136	0.005	0.057	0.011	0.084	0.674	0.359	0.033
17	1.	0.592	0.409	0.648	-0.030	0.076	-0.297	0.026	0.059	0.031	0.040	-0.085	0.555	0.459	0.024
18	1.	0.622	0.378	0.650	-0.037	0.163	-0.384	0.021	0.147	-0.003	0.021	-0.041	0.582	0.510	-0.051
19	1.	0.665	0.335	0.679	0.008	0.151	-0.408	-0.121	0.005	0.055	0.040	0.025	0.543	0.356	0.030
20	1.	0.659	0.301	0.695	0.015	0.249	-0.346	-0.179	-0.044	0.046	0.064	0.154	0.675	0.336	0.053
21	1.	0.634	0.366	0.695	-0.021	0.210	-0.297	-0.116	-0.063	0.058	0.110	0.127	0.599	0.363	0.094
22	1.	0.648	0.352	0.672	0.082	0.254	-0.314	-0.159	-0.032	0.089	0.018	0.171	0.642	0.311	0.080
23	1.	0.529	0.471	0.297	0.202	0.655	0.134	-0.191	0.077	-0.015	-0.073	0.671	0.353	0.149	-0.038
24	1.	0.651	0.349	0.336	0.172	0.675	0.040	-0.223	-0.026	-0.067	-0.095	0.622	0.493	0.138	-0.007
25	1.	0.475	0.505	0.259	0.074	0.391	0.463	-0.194	0.031	0.140	0.230	0.665	0.017	0.092	0.068
26	1.	1.535	0.415	0.363	-0.085	0.237	0.495	-0.317	-0.172	0.185	0.479	0.654	-0.016	0.004	0.188
27	1.	1.614	0.346	0.159	0.097	0.597	0.417	-0.190	-0.143	-0.003	0.094	0.741	0.102	-0.005	0.125
28	1.	0.681	0.319	0.266	0.430	-0.065	0.121	0.396	0.004	0.570	-0.094	-0.008	-0.036	0.344	0.491
29	1.	0.612	0.328	0.391	0.167	0.225	0.158	0.607	0.065	0.138	-0.059	0.072	-0.064	0.579	0.306
30	1.	0.712	0.298	0.539	-0.403	0.027	0.230	0.281	-0.091	0.051	0.556	0.089	-0.039	0.500	0.260
31	1.	0.734	0.216	0.626	-0.083	0.276	0.064	0.535	0.135	0.038	0.115	0.047	0.133	0.789	0.195
32	1.	0.793	0.201	0.613	-0.117	0.433	0.055	0.456	0.119	-0.064	0.105	0.169	0.230	0.779	0.136
33	1.	0.807	0.143	0.069	-0.093	0.159	-0.083	0.334	-0.806	-0.085	-0.011	-0.079	0.041	-0.058	0.663

0.434 0.566 0.469 0.531 0.534 0.487

DATA SET 3 (cont.)

3 33 4 2 3 1 0.963 10.000 0.100 14.718 6.449 4.689 3.095 2.448 1.596

0.701 0.311 60.000 1.000
0.677 0.423 60.000 2.000

1	1.	0.584	0.416	0.361	-0.223	0.097	0.277	-0.070	0.557	0.254	0.063	0.307	0.000	0.375	-0.110
2	1.	0.783	0.217	0.605	-0.494	-0.422	0.036	0.030	-0.139	0.768	0.001	-0.062	0.051	0.054	0.419
3	1.	0.703	0.297	0.516	-0.502	-0.420	0.072	0.056	-0.029	0.759	-0.018	-0.046	0.003	-0.021	0.384
4	1.	0.723	0.277	0.564	-0.456	-0.434	0.068	-0.051	-0.039	0.754	0.015	-0.084	-0.031	0.055	0.454
5	1.	0.761	0.239	0.550	-0.527	-0.337	0.096	0.035	-0.052	0.796	-0.016	-0.008	0.010	-0.023	0.432
6	1.	0.728	0.272	0.619	-0.457	-0.262	0.226	0.056	-0.111	0.764	0.137	0.176	0.026	0.009	0.446
7	1.	0.839	0.161	0.622	-0.571	-0.252	0.232	0.040	-0.133	0.831	0.063	0.198	0.027	-0.017	0.476
8	1.	0.779	0.221	0.619	-0.541	-0.210	0.213	0.058	-0.107	0.785	0.068	0.215	0.064	-0.013	0.459
9	1.	0.538	0.462	0.521	0.438	-0.145	0.085	0.139	-0.167	0.045	0.580	0.036	0.116	0.327	0.062
10	1.	0.696	0.304	0.572	0.569	-0.209	0.127	-0.023	0.089	0.000	0.650	-0.038	-0.001	0.551	-0.010
11	1.	0.758	0.242	0.543	0.622	-0.214	0.166	-0.016	0.055	-0.034	0.717	-0.029	-0.041	0.545	-0.020
12	1.	0.785	0.215	0.581	0.639	-0.254	0.112	0.008	-0.002	-0.004	0.703	-0.074	-0.000	0.533	0.016
13	1.	0.771	0.229	0.583	0.583	-0.198	0.202	0.041	0.050	0.010	0.739	0.032	-0.011	0.529	-0.026
14	1.	0.789	0.211	0.559	0.674	-0.210	0.196	0.057	0.012	-0.012	0.758	0.016	-0.019	0.505	-0.028
15	1.	0.795	0.205	0.552	0.625	-0.146	0.167	0.069	0.011	-0.044	0.744	0.049	0.043	0.539	-0.040
16	1.	0.678	0.322	0.697	-0.046	0.143	-0.350	0.212	-0.003	0.067	0.005	0.072	0.663	0.454	0.011
17	1.	0.598	0.402	0.660	0.040	0.032	-0.390	0.062	0.065	0.029	0.007	-0.095	0.542	0.537	0.031
18	1.	0.624	0.376	0.667	0.034	0.094	-0.388	0.061	0.145	-0.010	-0.013	-0.053	0.572	0.588	-0.027
19	1.	0.660	0.340	0.691	-0.009	0.089	-0.365	0.202	0.000	0.064	0.023	0.013	0.635	0.464	0.009
20	1.	0.690	0.310	0.709	-0.020	0.193	-0.311	0.231	-0.030	0.052	0.050	0.131	0.672	0.450	0.010
21	1.	0.634	0.366	0.708	0.013	0.159	-0.274	0.166	-0.060	0.064	0.099	0.110	0.603	0.457	0.065
22	1.	0.647	0.353	0.697	-0.089	0.192	-0.290	0.237	-0.020	0.092	0.007	0.148	0.647	0.416	0.037
23	1.	0.623	0.377	0.311	-0.212	0.661	0.131	0.109	0.074	-0.032	-0.034	0.649	0.426	0.136	-0.043
24	1.	0.645	0.355	0.361	-0.200	0.667	-0.003	0.169	-0.025	-0.076	-0.061	0.592	0.553	0.194	-0.031
25	1.	0.538	0.462	0.305	-0.039	0.449	0.480	0.067	0.013	0.142	0.306	0.701	0.074	0.093	0.066
26	1.	0.600	0.400	0.352	0.077	0.249	0.535	0.185	-0.187	0.198	0.546	0.661	0.043	0.039	0.126
27	1.	0.621	0.379	0.179	-0.124	0.637	0.364	0.053	-0.181	-0.002	0.163	0.737	0.182	-0.025	0.121
28	1.	0.685	0.315	0.560	-0.432	-0.114	0.341	-0.413	-0.013	0.555	-0.078	0.009	-0.034	0.257	0.579
29	1.	0.643	0.357	0.304	-0.123	0.135	-0.011	-0.660	0.052	0.108	-0.054	0.034	-0.054	0.463	0.475
30	1.	0.709	0.291	0.575	0.402	0.071	0.163	-0.330	-0.080	0.040	0.561	0.100	-0.023	0.584	0.311
31	1.	0.751	0.249	0.624	0.374	0.218	-0.060	-0.531	0.118	0.012	0.113	0.059	0.145	0.705	0.341
32	1.	0.759	0.241	0.621	0.093	0.377	-0.092	-0.463	0.095	-0.087	0.104	0.173	0.258	0.708	0.276
33	1.	0.665	0.335	0.674	0.095	0.147	-0.179	-0.237	-0.577	-0.072	0.006	-0.085	0.035	-0.083	0.582

0.511 0.490 0.556 0.510 0.596 0.434

DATA SET 4

4 20 3 1 1 1 1.000 31.000 0.367 822.108 132.374 104.443

0.839 0.643 60.000 1.000

1	1.	0.969	0.031	0.675	0.698	-0.164	0.932	-0.084	0.139
2	1.	0.930	0.070	0.665	-0.421	-0.558	-0.063	0.189	0.868
3	1.	0.953	0.047	0.302	-0.276	0.482	0.149	0.901	-0.035
4	1.	0.986	0.014	0.931	0.149	-0.523	0.517	0.025	0.697
5	1.	0.994	0.006	0.930	0.249	0.260	0.667	0.563	0.020
6	1.	0.991	0.009	0.875	-0.475	-0.024	-0.001	0.693	0.499
7	1.	0.991	0.009	0.826	0.404	-0.393	0.741	-0.008	0.485
8	1.	0.963	0.037	0.802	-0.117	-0.554	0.269	0.118	0.807
9	1.	0.972	0.028	0.968	0.455	0.107	0.816	0.324	0.059
10	1.	0.991	0.009	0.907	0.069	0.399	0.517	0.724	-0.053
11	1.	0.968	0.032	0.823	-0.491	-0.222	-0.044	0.539	0.658
12	1.	0.980	0.020	0.877	-0.429	0.164	0.043	0.800	0.322
13	1.	0.948	0.052	0.800	0.061	-0.552	0.425	0.031	0.742
14	1.	0.983	0.017	0.917	0.224	0.302	0.640	0.597	-0.013
15	1.	0.990	0.010	0.878	-0.466	-0.037	0.008	0.682	0.509
16	1.	0.917	0.083	0.795	0.048	-0.532	0.411	0.049	0.728
17	1.	0.932	0.068	0.897	0.197	0.297	0.606	0.595	-0.005
18	1.	0.960	0.040	0.868	-0.452	-0.052	0.016	0.659	0.513
19	1.	0.976	0.024	0.980	-0.037	-0.119	0.432	0.472	0.466
20	1.	0.930	0.070	0.945	-0.150	-0.121	0.316	0.506	0.495

0.625 0.649 0.654

4 20 [illegible] 1 2 1 1.000 8.000 0.050 14.690 2.425 2.246

0.913 0.646 60.000 1.000
0.888 0.633 9.000 2.000

1	1.	0.971	0.029	0.648	0.546	-0.503	-0.017	0.944	0.024
2	1.	0.948	0.052	0.743	-0.602	-0.184	0.069	0.009	0.902
3	1.	0.956	0.044	0.759	0.143	0.599	0.900	0.052	0.041
4	1.	0.977	0.023	0.871	-0.084	-0.461	-0.004	0.582	0.630
5	1.	0.987	0.013	0.880	0.445	0.116	0.604	0.599	0.010
6	1.	0.990	0.010	0.896	-0.306	0.306	0.622	-0.021	0.570
7	1.	0.981	0.019	0.836	0.193	-0.493	0.010	0.779	0.393
8	1.	0.958	0.042	0.857	-0.333	-0.335	0.048	0.331	0.766
9	1.	0.967	0.033	0.825	0.519	-0.131	0.381	0.775	0.006
10	1.	0.988	0.012	0.855	0.392	0.320	0.757	0.429	-0.026
11	1.	0.966	0.034	0.965	-0.441	0.153	0.448	-0.033	0.716
12	1.	0.976	0.024	0.875	-0.165	0.428	0.745	-0.007	0.404
13	1.	0.966	0.034	0.855	-0.183	-0.450	-0.022	0.501	0.700
14	1.	0.988	0.012	0.968	0.454	0.166	0.643	0.570	-0.019
15	1.	0.994	0.006	0.903	-0.306	0.292	0.614	-0.010	0.577
16	1.	0.938	0.062	0.949	-0.187	-0.426	-0.005	0.482	0.692
17	1.	0.940	0.060	0.851	0.479	0.181	0.642	0.536	-0.011
18	1.	0.957	0.043	0.903	-0.303	0.261	0.583	0.007	0.581
19	1.	0.978	0.022	0.588	0.007	-0.022	0.447	0.428	0.465
20	1.	0.936	0.064	0.963	-0.084	0.033	0.464	0.323	0.510

0.651 0.629 0.658

DATA SET 4 (cont.)

4 20 3 1 3 1 1.000 8.030 0.033 15.174 2.506 2.370

0.713 0.646 40.000 1.000
0.388 0.633 9.000 2.000

1	1.	0.971	0.029	0.648	0.536	-0.513	-0.016	0.944	0.023
2	1.	0.948	0.052	0.744	-0.605	-0.170	0.069	0.009	0.902
3	1.	0.956	0.044	0.758	0.156	0.597	0.900	0.051	0.042
4	1.	0.977	0.023	0.871	-0.092	-0.457	-0.004	0.582	0.629
5	1.	0.987	0.013	0.879	0.443	0.108	0.604	0.599	0.010
6	1.	0.990	0.010	0.996	-0.298	0.314	0.622	-0.021	0.570
7	1.	0.981	0.019	0.836	0.189	-0.496	0.010	0.780	0.393
8	1.	0.958	0.042	0.858	-0.339	-0.326	0.048	0.331	0.786
9	1.	0.966	0.034	0.824	0.517	-0.140	0.381	0.775	0.005
10	1.	0.988	0.012	0.854	0.400	0.314	0.757	0.429	-0.026
11	1.	0.966	0.034	0.966	-0.436	0.163	0.448	-0.033	0.716
12	1.	0.976	0.024	0.975	-0.155	0.432	0.745	-0.007	0.405
13	1.	0.967	0.033	0.856	-0.131	-0.445	-0.022	0.502	0.700
14	1.	0.988	0.012	0.867	0.459	0.158	0.643	0.570	-0.019
15	1.	0.994	0.006	0.903	-0.298	0.300	0.613	-0.010	0.577
16	1.	0.958	0.042	0.950	-0.194	-0.421	-0.005	0.483	0.692
17	1.	0.940	0.060	0.850	0.433	0.174	0.643	0.536	-0.011
18	1.	0.957	0.043	0.893	-0.296	0.269	0.587	0.007	0.581
19	1.	0.978	0.022	0.988	0.003	-0.020	0.447	0.429	0.465
20	1.	0.936	0.064	0.964	-0.081	0.036	0.464	0.324	0.510

0.651 0.628 0.658

4 20 3 2 1 1 1.000 15.000 0.050 4066.633 552.837 239.863

0.916 0.645 37.000 1.000
0.891 0.632 22.000 2.000

1	1.	0.961	0.039	0.849	0.302	0.386	0.937	0.000	0.009
2	1.	0.919	0.081	0.553	0.212	-0.754	0.018	0.068	0.882
3	1.	0.939	0.061	0.643	-0.671	-0.222	0.039	0.883	0.066
4	1.	0.989	0.011	0.868	0.390	-0.247	0.587	-0.020	0.635
5	1.	0.999	0.001	0.946	-0.299	0.121	0.594	0.614	0.002
6	1.	0.995	0.005	0.709	-0.319	-0.676	-0.073	0.607	0.580
7	1.	0.999	0.001	0.929	0.369	0.002	0.792	-0.000	0.390
8	1.	0.956	0.044	0.773	0.306	-0.514	0.351	0.043	0.771
9	1.	0.970	0.030	0.952	-0.067	0.245	0.769	0.391	-0.004
10	1.	0.987	0.013	0.869	-0.481	0.041	0.416	0.761	-0.027
11	1.	0.968	0.032	0.669	-0.139	-0.708	-0.022	0.432	0.719
12	1.	0.977	0.023	0.711	-0.464	-0.506	-0.010	0.732	0.415
13	1.	0.935	0.065	0.911	0.376	-0.368	0.493	-0.021	0.685
14	1.	0.984	0.016	0.922	-0.345	0.117	0.555	0.643	-0.021
15	1.	0.993	0.007	0.713	-0.104	-0.676	-0.013	0.595	0.588
16	1.	0.898	0.102	0.801	0.348	-0.369	0.475	0.002	0.669
17	1.	0.911	0.089	0.493	-0.328	0.084	0.523	0.624	0.008
18	1.	0.964	0.036	0.707	-0.287	-0.614	-0.005	0.576	0.587
19	1.	0.975	0.025	0.935	-0.077	-0.309	0.423	0.439	0.467
20	1.	0.924	0.076	0.864	-0.113	-0.403	0.300	0.455	0.521

0.626 0.650 0.659

DATA SET 4 (cont.)

4 20 3 2 2 1 1.000 3.000 0.033 14.722 2.457 2.278

0.910 0.546 60.000 1.000
0.386 0.633 32.000 2.000

1	1.	0.979	0.021	0.649	0.543	-0.513	-0.016	0.949	0.022
2	1.	0.962	0.038	0.745	-0.613	-0.177	0.068	0.007	0.912
3	1.	0.968	0.032	0.761	0.153	0.605	0.909	0.048	0.040
4	1.	0.979	0.021	0.871	-0.093	-0.460	-0.002	0.585	0.630
5	1.	0.986	0.014	0.880	0.447	0.110	0.605	0.599	0.012
6	1.	0.989	0.011	0.895	-0.301	0.310	0.623	-0.020	0.571
7	1.	0.982	0.018	0.836	0.193	-0.436	0.012	0.782	0.393
8	1.	0.965	0.035	0.853	-0.340	-0.333	0.048	0.333	0.791
9	1.	0.973	0.027	0.826	0.521	-0.139	0.383	0.779	0.004
10	1.	0.987	0.013	0.855	0.396	0.315	0.758	0.429	-0.023
11	1.	0.971	0.029	0.866	-0.441	0.161	0.452	-0.034	0.720
12	1.	0.979	0.021	0.876	-0.153	0.432	0.749	-0.007	0.406
13	1.	0.971	0.029	0.856	-0.190	-0.450	-0.022	0.505	0.702
14	1.	0.987	0.013	0.868	0.456	0.160	0.644	0.570	-0.017
15	1.	0.991	0.009	0.902	-0.390	0.296	0.615	-0.007	0.578
16	1.	0.950	0.050	0.852	-0.195	-0.432	-0.009	0.489	0.699
17	1.	0.953	0.047	0.853	0.439	0.179	0.650	0.541	-0.016
18	1.	0.964	0.036	0.894	-0.302	0.270	0.588	0.004	0.584
19	1.	0.978	0.022	0.989	0.008	-0.021	0.450	0.430	0.466
20	1.	0.943	0.057	0.967	-0.084	0.035	0.469	0.324	0.513

0.651 0.629 0.457

4 20 3 2 3 1 1.000 3.000 0.033 15.137 2.524 2.339

0.910 0.644 60.000 1.000
0.846 0.633 12.000 2.000

1	1.	0.979	0.021	0.649	0.537	-0.519	-0.016	0.949	0.022
2	1.	0.962	0.038	0.746	-0.614	-0.169	0.068	0.007	0.912
3	1.	0.968	0.032	0.760	0.161	0.604	0.909	0.048	0.041
4	1.	0.978	0.022	0.872	-0.094	-0.458	-0.001	0.585	0.630
5	1.	0.986	0.014	0.879	0.449	0.105	0.605	0.599	0.012
6	1.	0.988	0.012	0.895	-0.296	0.315	0.623	-0.020	0.571
7	1.	0.982	0.014	0.836	0.184	-0.497	0.017	0.782	0.393
8	1.	0.965	0.035	0.860	-0.343	-0.328	0.047	0.334	0.791
9	1.	0.973	0.027	0.875	0.521	-0.144	0.383	0.779	0.004
10	1.	0.987	0.013	0.854	0.401	0.311	0.758	0.429	-0.023
11	1.	0.971	0.029	0.867	-0.438	0.167	0.451	-0.034	0.720
12	1.	0.979	0.021	0.875	-0.153	0.435	0.748	-0.007	0.407
13	1.	0.971	0.029	0.857	-0.196	-0.447	-0.022	0.505	0.702
14	1.	0.987	0.013	0.867	0.459	0.155	0.644	0.570	-0.017
15	1.	0.991	0.009	0.902	-0.295	0.301	0.615	-0.007	0.578
16	1.	0.951	0.049	0.851	-0.199	-0.479	-0.009	0.489	0.699
17	1.	0.953	0.047	0.851	0.443	0.175	0.650	0.540	-0.016
18	1.	0.964	0.036	0.896	-0.298	0.274	0.588	0.004	0.585
19	1.	0.978	0.022	0.989	0.009	-0.020	0.450	0.430	0.466
20	1.	0.943	0.057	0.967	-0.082	0.038	0.468	0.325	0.513

0.651 0.628 0.657

DATA SET 5

5 8 2 1 1 1 0.999 71.000 0.050 27.433 9.008

1.111 0.984 13.000 1.000

1	1.	0.830	0.170	0.880	0.236	0.780	0.095
2	1.	0.893	0.107	0.974	0.359	0.865	-0.022
3	1.	0.834	0.166	0.946	0.343	0.834	-0.017
4	1.	0.801	0.199	0.856	0.267	0.782	0.062
5	1.	0.910	0.090	0.704	-0.644	0.023	0.854
6	1.	0.637	0.363	0.588	-0.539	0.019	0.714
7	1.	0.584	0.416	0.526	-0.555	-0.035	0.706
8	1.	0.463	0.537	0.574	-0.366	0.134	0.547

0.544 0.304

5 8 2 1 2 1 0.999 14.000 0.033 4.449 1.510

1.115 0.989 14.000 1.000

1	1.	0.839	0.167	0.856	0.324	0.791	0.072
2	1.	0.889	0.111	0.868	0.411	0.854	-0.010
3	1.	0.820	0.180	0.868	0.409	0.827	-0.025
4	1.	0.808	0.192	0.831	0.342	0.789	0.045
5	1.	0.887	0.113	0.750	-0.571	0.029	0.837
6	1.	0.640	0.360	0.631	-0.492	0.015	0.714
7	1.	0.583	0.417	0.569	-0.510	-0.038	0.704
8	1.	0.492	0.508	0.607	-0.351	0.110	0.577

0.989 0.399

5 8 2 1 1 1 0.999 9.000 0.050 5.938 2.062

1.117 0.990 24.000 1.000

1	1.	0.838	0.162	0.913	-0.420	0.793	0.065
2	1.	0.891	0.109	0.903	-0.496	0.851	-0.005
3	1.	0.819	0.181	0.758	-0.494	0.826	-0.027
4	1.	0.807	0.193	0.787	-0.432	0.789	0.042
5	1.	0.880	0.170	0.905	0.482	0.030	0.831
6	1.	0.639	0.361	0.680	0.477	0.014	0.713
7	1.	0.582	0.418	0.621	0.444	-0.038	0.702
8	1.	0.500	0.500	0.645	0.290	0.105	0.583

0.940 0.190

DATA SET 5 (cont.)

5 8 2 2 1 1 1.000 11.000 0.050 2746.550 1256.756

1.115 0.970 18.000 1.000

1	1.	0.745	0.255	0.778	0.374	0.127	0.714
2	1.	0.999	0.001	0.800	0.600	-0.047	0.921
3	1.	0.780	0.220	0.737	0.497	0.011	0.791
4	1.	0.702	0.298	0.743	0.388	0.096	0.709
5	1.	0.999	0.001	0.856	-0.516	0.908	-0.015
6	1.	0.583	0.417	0.675	-0.357	0.674	0.031
7	1.	0.533	0.467	0.677	-0.375	0.662	-0.009
8	1.	0.433	0.567	0.639	-0.160	0.491	0.183

0.969 0.971

5 8 2 2 2 1 0.979 4.000 0.033 4.673 1.771

1.090 0.989 19.000 1.000

1	1.	0.877	0.123	0.859	0.373	0.834	0.068
2	1.	0.903	0.097	0.841	0.442	0.876	-0.001
3	1.	0.872	0.128	0.813	0.459	0.871	-0.030
4	1.	0.861	0.139	0.839	0.396	0.839	0.038
5	1.	0.850	0.150	0.758	-0.574	0.078	0.816
6	1.	0.739	0.261	0.675	-0.533	0.018	0.785
7	1.	0.717	0.283	0.618	-0.580	-0.055	0.800
8	1.	0.625	0.375	0.671	-0.418	0.104	0.681

0.989 0.989

5 8 2 2 3 1 0.974 6.000 0.033 5.770 2.230

1.090 0.989 24.000 1.000

1	1.	0.877	0.123	0.821	0.450	0.836	0.063
2	1.	0.901	0.099	0.806	0.510	0.873	0.002
3	1.	0.871	0.129	0.769	0.529	0.871	-0.030
4	1.	0.862	0.138	0.800	0.471	0.841	0.035
5	1.	0.830	0.170	0.795	-0.544	0.084	0.803
6	1.	0.731	0.269	0.716	-0.467	0.021	0.779
7	1.	0.714	0.286	0.664	-0.524	-0.057	0.800
8	1.	0.653	0.347	0.717	-0.373	0.099	0.700

0.989 0.990

DATA SET 6

6 12 3 1 1 1 0.995100.000 0.100 22.715 4.413 2.006

0.974 0.791 29.000 1.000

1	1.	0.935	0.065	0.942	-0.217	0.002	0.835	0.358	-0.105
2	1.	0.626	0.374	0.703	-0.226	0.283	0.742	0.027	0.102
3	1.	0.343	0.657	0.352	0.364	0.295	0.127	0.109	0.468
4	1.	0.489	0.511	0.399	0.509	0.266	0.068	0.218	0.537
5	1.	0.760	0.240	0.869	0.070	-0.022	0.600	0.468	0.054
6	1.	0.632	0.368	0.354	0.557	0.444	0.056	0.083	0.705
7	1.	0.277	0.723	0.145	0.396	0.315	-0.041	0.008	0.497
8	1.	0.159	0.841	0.286	0.153	0.233	0.188	0.030	0.286
9	1.	0.028	0.972	0.092	0.080	0.117	0.054	-0.009	0.144
10	1.	0.016	0.984	0.110	-0.041	0.051	0.121	-0.004	0.018
11	1.	0.694	0.306	0.796	0.130	-0.157	0.436	0.587	0.020
12	1.	0.793	0.207	0.563	0.578	-0.377	-0.033	0.813	0.082

0.771 0.725 0.876

6 12 3 1 2 1 0.981 15.000 0.033 3.893 1.204 0.924

0.979 0.377 12.000 1.000

1	1.	0.899	0.101	0.812	-0.466	-0.146	0.921	-0.055	-0.027
2	1.	0.425	0.575	0.598	-0.255	-0.045	0.604	0.040	0.042
3	1.	0.316	0.684	0.485	0.284	-0.001	0.175	0.471	0.065
4	1.	0.568	0.432	0.577	0.476	-0.097	0.151	0.682	-0.018
5	1.	0.766	0.234	0.842	-0.227	-0.081	0.773	0.174	0.040
6	1.	0.562	0.438	0.562	0.495	0.038	0.088	0.695	0.113
7	1.	0.315	0.685	0.301	0.471	-0.056	-0.057	0.555	-0.016
8	1.	0.365	0.635	0.375	0.114	0.460	0.060	0.279	0.507
9	1.	0.363	0.637	0.187	-0.009	0.572	-0.034	0.088	0.593
10	1.	0.366	0.634	0.153	-0.147	0.567	0.029	-0.051	0.584
11	1.	0.702	0.298	0.806	-0.230	-0.025	0.732	0.156	0.090
12	1.	0.374	0.626	0.588	0.097	-0.139	0.407	0.348	-0.055

0.890 0.852 0.890

DATA SET 6 (cont.)

6 12 3 1 3 1 0.975 11.000 0.050 7.230 2.591 2.180

0.980 0.980 18.000 1.000

1	1.	0.959	0.041	0.734	-0.160	-0.628	-0.062	-0.029	0.955
2	1.	0.366	0.634	0.519	-0.107	-0.291	0.060	0.051	0.553
3	1.	0.317	0.683	0.522	0.146	0.150	0.473	0.060	0.174
4	1.	0.583	0.417	0.640	0.330	0.253	0.696	-0.018	0.141
5	1.	0.771	0.229	0.793	-0.075	-0.370	0.183	0.041	0.774
6	1.	0.578	0.422	0.652	0.221	0.323	0.699	0.112	0.105
7	1.	0.315	0.685	0.371	0.289	0.307	0.556	-0.012	-0.057
8	1.	0.363	0.637	0.412	-0.344	0.274	0.262	0.511	0.066
9	1.	0.349	0.651	0.208	-0.481	0.273	0.078	0.594	-0.038
10	1.	0.373	0.627	0.183	-0.562	0.157	-0.051	0.588	0.048
11	1.	0.781	0.219	0.784	-0.135	-0.385	0.140	0.082	0.788
12	1.	0.336	0.664	0.554	0.150	-0.086	0.337	-0.054	0.380

0.856 0.896 0.887

6 12 3 2 1 1 1.000 9.000 0.050 3297.110 1585.342 1096.033

0.817 0.659 31.000 1.000

1	1.	0.999	0.001	0.773	-0.566	0.285	0.166	0.937	0.271
2	1.	0.586	0.414	0.526	-0.316	0.446	-0.017	0.681	0.417
3	1.	0.255	0.745	0.423	0.230	0.153	0.274	0.089	0.402
4	1.	0.346	0.654	0.572	0.264	0.056	0.416	0.077	0.384
5	1.	0.706	0.294	0.768	-0.309	0.147	0.337	0.682	0.284
6	1.	0.999	0.001	0.632	0.679	0.373	0.430	-0.076	0.873
7	1.	0.137	0.863	0.252	0.266	0.056	0.229	-0.061	0.273
8	1.	0.144	0.856	0.318	0.087	0.188	0.130	0.161	0.319
9	1.	0.022	0.978	0.061	0.071	0.117	-0.008	0.018	0.149
10	1.	0.010	0.990	0.053	-0.083	0.008	0.004	0.095	-0.011
11	1.	0.623	0.377	0.754	-0.223	-0.067	0.492	0.529	0.153
12	1.	0.999	0.001	0.815	0.100	-0.571	0.963	0.121	-0.061

0.618 0.709 0.650

DATA SET 6 (cont.)

6 12 3 2 2 1 0.891 4.000 0.033 4.284 1.668 1.533

0.952 0.974 13.000 1.000

1	1.	0.858	0.142	0.780	-0.415	-0.280	0.911	-0.038	-0.000
2	1.	0.567	0.433	0.647	-0.337	-0.187	0.732	-0.013	0.040
3	1.	0.437	0.563	0.557	0.347	0.084	0.208	0.583	0.075
4	1.	0.645	0.355	0.622	0.503	0.030	0.201	0.733	-0.011
5	1.	0.798	0.202	0.840	-0.243	-0.182	0.828	0.161	0.052
6	1.	0.639	0.361	0.611	0.485	0.172	0.140	0.749	0.126
7	1.	0.544	0.456	0.354	0.636	0.115	-0.099	0.732	-0.018
8	1.	0.550	0.450	0.425	-0.046	0.606	0.067	0.335	0.658
9	1.	0.598	0.402	0.214	-0.224	0.708	-0.049	0.111	0.769
10	1.	0.602	0.398	0.174	-0.399	0.542	0.037	-0.071	0.752
11	1.	0.773	0.227	0.820	-0.280	-0.148	0.816	0.128	0.091
12	1.	0.475	0.525	0.654	0.121	-0.192	0.511	0.371	-0.090

0.888 0.847 0.887

6 12 3 2 3 1 0.869 9.000 0.033 6.703 2.764 2.532

0.944 0.369 21.000 1.000

1	1.	0.827	0.173	0.715	0.197	-0.527	0.895	0.021	-0.034
2	1.	0.578	0.422	0.606	0.199	-0.415	0.740	0.061	-0.023
3	1.	0.486	0.514	0.611	-0.219	0.254	0.210	0.082	0.525
4	1.	0.611	0.389	0.657	-0.339	0.254	0.224	-0.007	0.707
5	1.	0.768	0.232	0.794	0.115	-0.352	0.914	0.064	0.167
6	1.	0.616	0.384	0.661	-0.237	0.351	0.172	0.179	0.726
7	1.	0.561	0.439	0.411	-0.424	0.461	-0.106	-0.015	0.744
8	1.	0.564	0.436	0.447	0.441	0.412	0.078	0.673	0.328
9	1.	0.587	0.413	0.215	0.611	0.409	-0.055	0.764	0.113
10	1.	0.589	0.411	0.176	0.703	0.239	0.052	0.743	-0.059
11	1.	0.770	0.230	0.778	0.165	-0.371	0.823	0.091	0.122
12	1.	0.508	0.492	0.666	-0.186	-0.171	0.554	-0.110	0.356

0.882 0.381 0.341

DATA SET 7

7 15 5 1 1 1 0.993 92.000 0.167 10.868 4.258 2.938 2.298 1.301

0.879 0.656 60.000 1.000

1	1.	0.815	0.185	0.819	0.152	0.041	0.325	0.116	0.714	0.067	0.092	0.026	-0.023
2	1.	0.705	0.295	0.557	0.414	-0.156	-0.440	0.068	0.102	0.024	0.112	0.703	0.005
3	-1.	0.385	0.615	-0.274	-0.241	-0.325	-0.070	0.376	-0.035	-0.054	0.040	0.113	0.524
4	1.	0.421	0.579	0.418	0.031	-0.372	-0.323	0.044	0.046	-0.002	0.370	0.496	0.141
5	1.	0.381	0.619	0.477	-0.272	-0.269	0.033	-0.077	0.195	0.077	0.507	0.053	0.042
6	1.	0.676	0.324	0.751	0.029	-0.162	0.284	0.059	0.622	-0.013	0.259	0.040	0.023
7	1.	0.458	0.542	0.543	0.190	-0.279	-0.222	-0.030	0.170	-0.047	0.283	0.452	-0.010
8	-1.	0.570	0.430	-0.274	-0.530	-0.234	0.012	0.399	-0.038	0.133	0.163	-0.374	0.584
9	1.	0.140	0.860	0.123	-0.259	-0.229	-0.060	0.041	0.005	0.058	0.312	0.066	0.166
10	1.	0.739	0.261	0.437	-0.623	-0.309	-0.081	-0.241	-0.049	0.241	0.834	-0.031	0.002
11	1.	0.314	0.686	0.546	0.092	-0.061	0.055	0.007	0.339	0.044	0.174	0.147	-0.038
12	1.	0.279	0.721	0.275	0.283	0.199	-0.333	0.012	-0.045	0.133	-0.030	0.405	-0.083
13	-1.	0.272	0.728	-0.050	-0.322	0.129	0.005	0.386	0.066	0.320	-0.016	-0.049	0.399
14	1.	0.341	0.659	0.255	0.025	0.205	-0.361	0.321	-0.003	0.404	-0.022	0.399	0.241
15	1.	0.793	0.207	0.567	-0.403	0.526	-0.181	-0.003	0.007	0.792	0.346	-0.012	-0.080

0.775 0.548 0.651 0.666 0.639

7 15 5 1 2 1 0.981 35.000 0.087 3.398 1.537 0.911 0.778 0.613

1.776 0.580 45.000 1.000

1	1.	0.645	0.355	0.739	0.032	-0.300	-0.069	-0.057	0.677	-0.071	0.054	0.257	-0.038
2	1.	0.733	0.267	0.669	0.258	0.394	0.114	-0.170	0.241	0.074	0.704	0.126	-0.009
3	-1.	0.447	0.553	-0.274	-0.410	0.303	0.138	-0.305	-0.086	0.574	0.187	-0.022	-0.053
4	1.	0.437	0.563	0.493	-0.161	0.341	0.227	-0.026	0.290	0.268	0.480	-0.011	0.230
5	1.	0.519	0.481	0.464	-0.392	-0.157	0.263	-0.237	0.661	0.374	0.075	0.012	-0.042
6	1.	0.598	0.402	0.709	-0.123	-0.279	0.030	-0.073	0.708	0.019	0.032	0.172	0.047
7	1.	0.486	0.514	0.631	0.012	0.202	0.167	0.137	0.339	0.001	0.390	-0.005	0.291
8	-1.	0.493	0.507	-0.308	-0.593	0.147	-0.094	-0.100	-0.046	0.513	-0.064	0.124	0.138
9	1.	0.625	0.375	0.171	-0.459	0.212	-0.051	0.580	0.035	0.027	-0.005	-0.014	0.764
10	1.	0.456	0.544	0.388	-0.540	-0.111	0.051	0.006	0.549	0.334	-0.025	0.126	0.228
11	1.	0.340	0.660	0.555	0.036	-0.074	-0.101	0.121	0.381	-0.109	0.118	0.194	0.159
12	1.	0.296	0.704	0.325	0.327	0.233	-0.134	-0.104	0.011	-0.059	0.402	0.215	-0.069
13	-1.	0.255	0.745	-0.123	-0.309	0.032	-0.347	-0.154	0.016	0.314	-0.041	0.370	-0.015
14	1.	0.451	0.549	0.287	0.024	0.382	-0.471	-0.026	-0.035	0.147	0.424	0.532	0.164
15	1.	0.457	0.543	0.420	-0.147	-0.166	-0.435	-0.123	0.430	0.131	0.017	0.573	-0.020

0.615 0.560 0.558 0.516 0.6[illegible]

DATA SET 7 (cont.)

7 15 5 1 3 1 0.578 12.000 0.050 6.816 3.336 1.366 1.771 1.113

0.759 0.566 60.000 1.000

1	1.	0.628	0.372	0.726	0.012	-0.095	0.289	0.093	0.650	-0.076	0.344	0.061	-0.035
2	1.	0.715	0.285	0.676	-0.253	0.164	-0.361	0.184	0.289	0.077	0.140	0.690	-0.011
3	-1.	0.483	0.517	-0.296	0.418	0.107	-0.369	0.272	-0.056	0.603	-0.031	0.215	-0.051
4	1.	0.439	0.561	0.485	0.159	-0.047	-0.419	0.015	0.353	0.242	-0.020	0.455	0.245
5	1.	0.546	0.454	0.439	0.402	-0.329	-0.035	0.287	0.703	0.344	0.068	0.360	-0.349
6	1.	0.577	0.423	0.687	0.154	-0.187	0.211	0.050	0.690	0.000	0.259	0.026	0.061
7	1.	0.466	0.534	0.629	-0.008	-0.053	-0.236	-0.107	0.383	-0.007	0.043	0.369	0.273
8	-1.	0.506	0.494	-0.325	0.603	0.147	-0.095	0.006	-0.036	0.520	0.124	-0.062	0.160
9	1.	0.601	0.399	0.171	0.414	0.015	-0.170	-0.609	0.071	0.035	-0.010	-0.006	0.750
10	1.	0.455	0.545	0.381	0.529	-0.166	0.047	-0.016	0.576	0.299	0.184	-0.031	0.230
11	1.	0.338	0.662	0.559	-0.019	0.026	0.111	-0.109	0.369	-0.106	0.240	0.134	0.160
12	1.	0.302	0.698	0.351	-0.302	0.262	-0.104	0.088	0.023	-0.057	0.191	0.406	-0.070
13	-1.	0.274	0.726	-0.137	0.355	0.314	0.163	0.064	-0.008	0.333	0.374	-0.040	-0.007
14	1.	0.432	0.568	0.305	0.012	0.573	-0.075	-0.067	-0.034	0.173	0.476	0.446	0.160
15	1.	0.457	0.543	0.431	0.206	0.276	0.383	0.075	0.396	0.140	0.609	0.034	-0.026

0.530 0.553 0.506 0.583 0.597

7 15 5 2 1 1 0.993 10.000 0.067 3669.195 2170.266 1564.520 1091.560 1379.088

0.926 0.712 26.000 1.000

1	1.	0.999	0.001	0.744	0.306	-0.083	0.551	0.206	0.852	-0.050	-0.041	0.031	0.073
2	1.	0.999	0.001	0.494	0.514	-0.591	-0.377	0.022	-0.027	0.048	0.858	0.057	-0.009
3	-1.	0.999	0.001	-0.373	-0.441	-0.425	-0.012	0.697	0.068	-0.029	0.251	-0.029	0.944
4	1.	0.310	0.690	0.337	0.010	-0.434	-0.085	0.035	0.073	0.250	0.443	-0.010	0.151
5	1.	0.321	0.679	0.443	-0.233	-0.223	0.105	0.082	0.235	0.377	0.160	0.104	0.131
6	1.	0.558	0.442	0.623	0.111	-0.195	0.345	0.033	0.540	0.172	0.083	-0.009	0.028
7	1.	0.361	0.639	0.435	0.197	-0.357	-0.014	-0.076	0.154	0.171	0.382	-0.040	-0.039
8	-1.	0.301	0.699	-0.216	-0.472	-0.054	-0.009	0.170	-0.098	0.192	-0.061	0.024	0.343
9	1.	0.091	0.909	0.117	-0.246	-0.070	0.056	-0.092	0.009	0.277	-0.015	-0.011	0.022
10	1.	0.999	0.001	0.579	-0.729	-0.261	0.024	-0.253	-0.004	0.953	0.135	0.135	0.037
11	1.	0.286	0.714	0.469	0.130	-0.130	0.168	-0.059	0.305	0.143	0.104	0.011	-0.080
12	1.	0.192	0.808	0.239	0.261	-0.154	-0.202	0.052	-0.015	-0.029	0.341	0.122	-0.029
13	1.	0.117	0.383	0.009	-0.200	0.099	-0.054	0.253	0.017	0.036	-0.032	0.223	0.231
14	1.	0.178	0.322	0.243	0.146	0.034	-0.241	0.196	-0.018	-0.037	0.234	0.323	0.049
15	1.	0.999	0.001	0.764	-0.143	0.467	-0.313	0.279	0.064	0.297	0.046	0.915	-0.034

0.743 0.714 0.721 0.665 0.679

DATA SET 7 (cont.)

7 15 5 2 2 1 0.894 4.000 0.050 3.867 2.060 1.405 1.352 1.062

0.725 0.541 52.000 1.000

1	1.	0.696	0.304	0.761	-0.029	-0.255	-0.200	0.106	0.722	-0.055	0.086	0.313	-0.012
2	1.	0.734	0.266	0.672	-0.283	0.331	0.237	0.188	0.281	0.027	0.713	0.213	0.068
3	-1.	0.709	0.291	-0.302	0.494	0.343	0.307	0.402	-0.090	0.718	0.309	-0.035	-0.055
4	1.	0.637	0.363	0.539	0.194	0.285	0.477	0.024	0.307	0.320	0.611	-0.013	0.375
5	1.	0.706	0.294	0.494	0.445	-0.283	0.206	0.372	0.755	0.443	0.124	0.010	-0.054
6	1.	0.667	0.333	0.740	0.134	-0.299	-0.095	0.060	0.761	0.043	0.053	0.221	0.087
7	1.	0.597	0.403	0.681	-0.016	0.134	0.295	-0.166	0.358	0.002	0.457	0.041	0.406
8	-1.	0.634	0.366	-0.332	0.691	0.213	-0.027	0.016	-0.060	0.624	-0.058	0.095	0.219
9	1.	0.827	0.173	0.179	0.465	0.163	0.105	-0.736	0.005	0.100	-0.019	-0.031	0.888
10	1.	0.608	0.392	0.424	0.626	-0.136	0.018	-0.028	0.629	0.430	-0.032	0.120	0.316
11	1.	0.476	0.524	0.628	-0.048	-0.053	-0.166	-0.223	0.423	-0.150	0.107	0.272	0.281
12	1.	0.544	0.456	0.375	-0.413	0.432	-0.052	0.199	0.003	-0.064	0.573	0.364	-0.094
13	-1.	0.580	0.420	-0.144	0.430	0.274	-0.521	0.168	0.061	0.491	-0.044	0.569	-0.026
14	1.	0.684	0.316	0.316	-0.024	0.696	-0.322	-0.100	-0.054	0.189	0.515	0.662	0.308
15	1.	0.648	0.352	0.471	0.182	0.017	-0.616	0.119	0.528	0.183	-0.002	0.695	-0.014

0.577 0.536 0.551 0.495 0.545

7 15 5 2 3 1 0.879 11.000 0.067 5.997 3.183 2.159 2.118 1.542

0.706 0.523 60.000 1.000

1	1.	0.684	0.316	0.754	-0.011	0.037	-0.320	-0.111	0.704	-0.073	0.323	0.061	0.061
2	1.	0.706	0.294	0.667	-0.271	-0.078	0.384	-0.184	0.275	-0.000	0.238	0.681	0.116
3	-1.	0.666	0.334	-0.306	0.479	-0.042	0.473	-0.343	-0.083	0.674	-0.045	0.334	-0.075
4	1.	0.641	0.359	0.533	0.190	0.152	0.544	-0.038	0.312	0.325	-0.006	0.605	0.386
5	1.	0.708	0.292	0.478	0.440	0.334	-0.034	-0.416	0.757	0.406	0.013	0.151	-0.052
6	1.	0.660	0.340	0.723	0.148	0.146	-0.275	-0.063	0.746	0.029	0.223	0.078	0.156
7	1.	0.608	0.392	0.686	-0.018	0.124	0.307	0.166	0.345	0.018	0.059	0.438	0.461
8	-1.	0.638	0.362	-0.335	0.688	-0.156	0.156	0.059	-0.061	0.648	0.068	-0.047	0.213
9	1.	0.733	0.267	0.178	0.434	0.012	0.191	0.690	0.007	0.211	-0.032	-0.030	0.830
10	1.	0.619	0.381	0.423	0.634	0.166	-0.098	-0.008	0.648	0.465	0.115	-0.013	0.311
11	1.	0.562	0.438	0.649	-0.038	-0.075	-0.178	0.318	0.394	-0.154	0.285	0.039	0.416
12	1.	0.596	0.404	0.388	-0.425	-0.380	0.271	-0.217	-0.002	-0.078	0.408	0.587	-0.086
13	-1.	0.607	0.393	-0.148	0.461	-0.579	-0.166	-0.101	0.064	0.524	0.567	-0.048	-0.021
14	1.	0.657	0.343	0.316	-0.016	-0.684	0.261	0.142	-0.063	0.233	0.650	0.485	0.321
15	1.	0.643	0.357	0.467	0.203	-0.435	-0.408	-0.161	0.543	0.224	0.688	-0.001	-0.123

0.557 0.515 0.476 0.525 0.523

DATA SET 8

8 17 5 1 1 1 0.998 71.000 0.150 22.745 7.152 5.225 2.405 1.819

1.212 0.875 18.000 1.000

1	1.	0.201	0.799	0.432	-0.053	0.072	-0.064	0.046	0.131	-0.019	0.095	0.141	0.108
2	1.	0.111	0.389	0.288	0.024	0.012	-0.148	0.076	0.050	0.039	-0.022	0.195	0.089
3	1.	0.830	0.170	0.819	-0.278	-0.266	0.099	-0.023	0.626	-0.048	0.007	-0.009	0.117
4	1.	0.864	0.136	0.847	-0.267	-0.228	-0.015	-0.154	0.680	0.004	0.056	0.100	-0.027
5	1.	0.772	0.228	0.805	-0.011	-0.331	0.032	-0.113	0.617	0.238	0.001	0.035	0.022
6	1.	0.593	0.407	0.598	-0.013	0.137	-0.457	0.057	0.074	0.019	0.050	0.563	0.057
7	1.	0.687	0.313	0.456	0.030	0.260	-0.608	0.051	-0.033	0.033	0.029	0.706	0.004
8	1.	0.434	0.566	0.528	-0.132	0.085	-0.361	-0.038	0.194	-0.046	0.019	0.443	-0.034
9	1.	0.627	0.373	0.349	0.706	-0.056	0.029	-0.023	-0.024	0.694	0.132	0.005	0.091
10	1.	0.769	0.231	0.222	0.815	-0.194	-0.067	-0.090	-0.009	0.841	0.016	0.058	-0.031
11	1.	0.682	0.318	0.268	0.736	-0.254	0.030	-0.061	0.059	0.778	-0.002	-0.035	0.019
12	1.	0.550	0.450	0.561	0.152	0.436	0.081	-0.124	0.033	0.114	0.555	0.049	0.043
13	1.	0.829	0.171	0.565	0.042	0.659	0.180	-0.204	0.004	-0.029	0.787	-0.023	0.002
14	1.	0.503	0.497	0.606	0.220	0.273	0.113	0.009	0.046	0.182	0.404	0.014	0.176
15	1.	0.733	0.267	0.724	0.077	0.127	0.138	0.410	-0.014	-0.020	0.127	0.023	0.566
16	1.	0.642	0.358	0.683	0.048	-0.050	0.109	0.399	0.081	0.038	-0.023	0.021	0.527
17	1.	0.534	0.466	0.634	0.119	0.173	0.111	0.273	-0.013	0.039	0.190	0.030	0.419

0.868 0.906 0.362 0.882 0.855

8 17 5 1 2 1 0.994 16.000 0.067 5.930 1.949 1.083 0.841 0.664

1.080 0.343 25.000 1.000

1	1.	0.440	0.560	0.463	-0.136	0.011	-0.259	0.374	0.119	-0.030	0.154	0.005	0.513
2	1.	0.570	0.430	0.337	-0.063	-0.023	-0.491	0.460	-0.004	0.051	-0.011	0.038	0.694
3	1.	0.843	0.157	0.741	-0.287	-0.431	0.148	-0.071	0.807	-0.066	0.054	0.020	-0.034
4	1.	0.795	0.205	0.763	-0.286	-0.351	0.010	-0.036	0.721	-0.043	0.014	0.142	0.031
5	1.	0.752	0.248	0.757	-0.015	-0.410	0.027	-0.102	0.705	0.217	-0.003	0.087	-0.002
6	1.	0.624	0.376	0.674	-0.149	0.213	-0.264	-0.312	0.137	0.057	0.025	0.586	-0.030
7	1.	0.634	0.366	0.543	-0.124	0.322	-0.372	-0.278	-0.025	0.064	0.009	0.643	0.046
8	1.	0.443	0.557	0.537	-0.234	0.074	-0.230	-0.202	0.220	-0.043	-0.020	0.441	0.035
9	1.	0.633	0.367	0.421	0.671	0.020	0.030	-0.066	0.033	0.723	0.182	0.027	-0.044
10	1.	0.773	0.227	0.303	0.806	-0.059	-0.148	-0.070	-0.038	0.863	-0.007	0.071	0.033
11	1.	0.683	0.317	0.326	0.736	-0.153	-0.107	0.023	0.062	0.800	0.010	-0.033	0.093
12	1.	0.522	0.478	0.556	0.037	0.362	0.176	0.057	0.018	0.071	0.540	0.077	0.020
13	1.	0.639	0.361	0.581	-0.087	0.468	0.244	0.120	-0.034	-0.085	0.557	0.039	0.036
14	1.	0.549	0.451	0.646	0.130	0.225	0.252	0.002	0.156	0.182	0.509	0.027	-0.064
15	1.	0.596	0.404	0.738	-0.013	0.019	0.160	0.156	0.352	0.089	0.425	-0.049	0.133
16	1.	0.504	0.496	0.681	-0.015	-0.122	0.111	0.105	0.437	0.117	0.270	-0.040	0.111
17	1.	0.478	0.522	0.559	0.024	0.077	0.157	0.110	0.264	0.110	0.412	-0.019	0.084

1.604 0.869 0.529 0.882 0.364

DATA SET ʃ (cont.)

4 17 5 1 3 1 0.994 14.000 0.050 9.866 2.852 1.626 1.462 1.195

1.068 0.840 25.000 1.000

1	1.	0.436	0.564	0.474	-0.143	0.172	-0.258	0.299	0.137	-0.030	0.146	0.507	0.011
2	1.	0.592	0.408	0.350	-0.111	0.316	-0.483	0.353	0.001	0.054	-0.014	0.712	0.030
3	1.	0.819	0.181	0.714	-0.244	0.322	0.373	-0.038	0.801	-0.072	0.043	-0.039	0.036
4	1.	0.765	0.235	0.740	-0.264	0.304	0.202	-0.121	0.698	-0.049	0.005	0.042	0.163
5	1.	0.725	0.275	0.730	0.010	0.344	0.220	-0.150	0.685	0.212	-0.013	-0.001	0.112
6	1.	0.627	0.373	0.632	-0.173	-0.110	-0.239	-0.360	0.135	0.061	0.027	-0.033	0.593
7	1.	0.615	0.385	0.560	-0.162	-0.159	-0.385	-0.320	-0.027	0.068	0.025	0.052	0.626
8	1.	0.447	0.553	0.542	-0.254	0.014	-0.169	-0.247	0.213	-0.042	-0.020	0.043	0.448
9	1.	0.631	0.369	0.415	0.672	-0.017	-0.032	-0.073	0.046	0.719	0.181	-0.044	0.028
10	1.	0.775	0.225	0.293	0.794	0.121	-0.177	-0.115	-0.040	0.869	-0.004	0.038	0.068
11	1.	0.678	0.322	0.313	0.728	0.198	-0.098	-0.032	0.067	0.796	0.006	0.085	-0.031
12	1.	0.517	0.483	0.605	0.049	-0.371	-0.015	0.106	0.027	0.076	0.537	0.021	0.090
13	1.	0.677	0.323	0.604	-0.073	-0.513	0.003	0.210	-0.033	-0.089	0.687	0.039	0.041
14	1.	0.542	0.453	0.652	0.152	-0.275	0.123	0.055	0.182	0.182	0.501	-0.064	0.035
15	1.	0.619	0.381	0.750	0.006	-0.018	0.168	0.167	0.416	0.087	0.416	0.110	-0.059
16	1.	0.524	0.476	0.682	0.007	0.126	0.187	0.091	0.489	0.115	0.253	0.091	-0.042
17	1.	0.480	0.520	0.664	0.043	-0.078	0.124	0.123	0.312	0.110	0.396	0.063	-0.020

0.793 0.967 0.300 0.870 0.869

8 17 5 2 1 1 1.000 13.000 0.067 4385.652 1972.882 1288.756 1367.724 963.057

1.128 0.843 45.000 1.000

1	1.	0.199	0.801	0.427	-0.053	-0.057	0.352	-0.090	0.094	0.008	0.097	0.093	0.225
2	1.	0.655	0.905	0.292	0.026	-0.090	-0.020	0.073	0.104	0.029	0.006	0.159	0.074
3	1.	0.717	0.283	0.651	-0.163	-0.245	0.293	-0.347	0.125	-0.043	-0.002	0.013	0.632
4	1.	0.999	0.001	0.742	-0.165	-0.277	0.232	-0.540	-0.075	0.001	0.032	0.069	0.822
5	1.	0.645	0.355	0.526	0.057	-0.201	0.274	-0.366	0.075	0.174	-0.016	0.031	0.602
6	1.	0.470	0.530	0.619	0.001	-0.177	-0.235	0.014	0.089	0.014	0.092	0.462	0.146
7	1.	0.999	0.001	0.670	0.105	-0.357	-0.626	0.140	0.010	0.032	-0.017	0.909	-0.003
8	1.	0.342	0.658	0.516	-0.088	-0.200	-0.137	-0.097	0.034	-0.055	0.042	0.334	0.256
9	1.	0.494	0.506	0.335	0.580	0.186	0.100	0.029	0.118	0.618	0.110	0.033	-0.030
10	1.	0.999	0.001	0.255	0.940	0.195	0.081	-0.086	-0.025	0.976	0.027	0.058	0.004
11	1.	0.549	0.451	0.222	0.667	0.122	0.146	-0.076	0.055	0.702	-0.008	-0.039	0.061
12	1.	0.477	0.523	0.612	-0.044	0.304	-0.042	0.043	0.126	0.078	0.483	0.094	0.025
13	1.	0.999	0.001	0.767	-0.257	0.636	-0.171	-0.000	0.037	-0.031	0.881	-0.021	0.000
14	1.	0.429	0.571	0.418	0.041	0.203	0.054	0.044	0.213	0.141	0.346	0.058	0.075
15	1.	0.999	0.001	0.791	-0.029	-0.036	0.454	0.398	0.800	-0.040	0.035	0.004	-0.015
16	1.	0.497	0.503	0.612	0.017	-0.130	0.313	0.085	0.432	0.045	-0.005	0.033	0.190
17	1.	0.444	0.556	0.626	0.003	0.062	0.163	0.147	0.376	0.061	0.196	0.062	0.053

1.102 0.996 0.349 0.827 0.941

DATA SET 3 (cont.)

9 17 5 2 2 1 0.069 4.000 0.033 6.314 2.253 1.406 1.268 1.108

1.907 0.546 17.000 1.000

1	1.	0.699	0.301	0.493	-0.181	0.098	-0.417	0.489	0.129	-0.036	0.173	0.724	-0.003
2	1.	0.793	0.207	0.352	-0.089	0.170	-0.647	0.462	-0.008	0.082	-0.029	0.845	0.067
3	1.	0.851	0.149	0.733	-0.274	0.414	0.247	-0.080	0.836	-0.079	0.044	-0.033	0.066
4	1.	0.820	0.180	0.762	-0.286	0.366	0.103	-0.114	0.760	-0.054	0.015	0.033	0.190
5	1.	0.801	0.199	0.760	-0.006	0.433	0.120	-0.146	0.758	0.216	-0.073	-0.010	0.133
6	1.	0.728	0.272	0.645	-0.177	-0.137	-0.270	-0.411	0.143	0.073	0.081	-0.031	0.698
7	1.	0.752	0.248	0.566	-0.154	-0.307	-0.421	-0.370	-0.049	0.088	0.086	0.073	0.750
8	1.	0.633	0.367	0.572	-0.299	-0.044	-0.276	-0.372	0.234	-0.040	-0.045	0.021	0.639
9	1.	0.750	0.250	0.433	0.745	-0.032	-0.009	-0.082	0.042	0.797	0.194	-0.045	0.038
10	1.	0.829	0.171	0.305	0.830	0.070	-0.178	-0.102	-0.040	0.901	0.003	0.046	0.063
11	1.	0.793	0.207	0.332	0.795	0.132	-0.135	-0.072	0.072	0.867	-0.012	0.096	-0.028
12	1.	0.665	0.335	0.627	0.044	-0.489	0.116	0.133	-0.002	0.066	0.691	0.029	0.112
13	1.	0.759	0.241	0.601	-0.097	-0.565	0.157	0.212	-0.030	-0.102	0.778	0.052	0.071
14	1.	0.643	0.357	0.676	0.155	-0.308	0.251	0.060	0.193	0.187	0.612	-0.087	0.041
15	1.	0.662	0.338	0.766	-0.016	0.007	0.192	0.196	0.459	0.081	0.459	0.123	-0.050
16	1.	0.607	0.393	0.716	-0.011	0.204	0.190	0.126	0.579	0.112	0.271	0.094	-0.060
17	1.	0.564	0.436	0.699	0.033	-0.083	0.195	0.176	0.354	0.102	0.450	0.077	-0.043

0.832 0.879 0.923 0.894 0.964

8 17 5 2 3 1 0.556 12.000 0.033 3.903 2.897 1.880 1.781 1.535

0.456 0.837 19.000 1.000

1	1.	0.719	0.281	0.491	-0.123	0.305	0.152	0.569	0.129	-0.036	0.159	0.004	0.740
2	1.	0.769	0.231	0.345	-0.107	0.462	0.304	0.576	-0.006	0.086	-0.032	0.061	0.831
3	1.	0.821	0.179	0.719	-0.258	0.239	-0.369	-0.208	0.816	-0.032	0.032	0.109	-0.038
4	1.	0.791	0.209	0.746	-0.281	0.270	-0.209	-0.195	0.731	-0.055	0.003	0.235	0.036
5	1.	0.774	0.226	0.744	-0.001	0.327	-0.230	-0.249	0.732	0.216	-0.034	0.179	-0.013
6	1.	0.712	0.288	0.645	-0.198	-0.029	0.416	-0.246	0.141	0.076	0.103	0.692	-0.028
7	1.	0.723	0.277	0.567	-0.191	-0.053	0.576	-0.181	-0.052	0.093	0.119	0.723	0.079
8	1.	0.662	0.338	0.573	-0.332	0.104	0.358	-0.280	0.223	-0.037	-0.044	0.671	0.018
9	1.	0.756	0.244	0.428	0.744	0.021	0.096	-0.044	0.050	0.801	0.188	0.041	-0.041
10	1.	0.820	0.180	0.295	0.811	0.193	0.194	-0.067	-0.038	0.896	0.107	0.061	0.050
11	1.	0.789	0.211	0.321	0.783	0.255	0.085	-0.078	0.072	0.864	-0.014	-0.024	0.092
12	1.	0.676	0.324	0.634	0.059	-0.477	0.123	0.165	-0.010	0.065	0.702	0.135	0.035
13	1.	0.748	0.252	0.609	-0.573	-0.554	0.083	0.234	-0.021	-0.103	0.774	0.091	0.057
14	1.	0.651	0.349	0.686	0.141	-0.378	-0.065	0.020	0.206	0.188	0.616	0.060	-0.035
15	1.	0.682	0.318	0.775	0.007	-0.057	-0.251	0.122	0.506	0.071	0.442	-0.049	0.115
16	1.	0.647	0.353	0.723	0.002	0.122	-0.329	0.073	0.633	0.103	0.244	-0.053	0.087
17	1.	0.599	0.401	0.714	0.052	-0.147	-0.216	0.133	0.404	0.089	0.494	-0.063	0.079

1.734 0.983 0.748 0.936 0.887

DATA SET 9

9 17 5 1 1 1 0.598 59.000 0.117 20.906 6.243 4.377 2.745 1.754

1.186 0.961 26.003 1.000

1	1.	0.390	0.700	0.437	-0.034	0.017	0.210	0.252	-0.030	-0.052	0.022	0.167	0.347
2	1.	0.195	0.315	0.403	0.097	0.041	0.062	0.072	0.056	0.042	0.165	0.093	0.161
3	1.	0.819	0.191	0.924	-0.291	-0.081	-0.214	-0.052	0.665	-0.009	0.316	0.026	0.025
4	1.	0.863	0.160	0.948	-0.279	-0.055	-0.169	-0.112	0.656	-0.014	0.254	0.090	-0.020
5	1.	0.742	0.259	0.799	-0.205	-0.140	-0.192	-0.079	0.624	0.096	-0.006	0.056	0.007
6	1.	0.728	0.272	0.646	-0.049	-0.054	0.576	-0.170	0.024	0.006	0.040	0.573	0.015
7	1.	0.642	0.358	0.627	0.124	-0.159	0.466	-0.074	0.017	0.124	-0.036	0.563	0.091
8	1.	0.500	0.500	0.579	-0.132	-0.060	0.353	-0.140	0.137	-0.032	0.001	0.493	-0.002
9	1.	0.588	0.417	0.313	0.626	-0.294	-0.051	-0.093	-0.004	0.703	0.076	0.072	-0.007
10	1.	0.656	0.344	0.244	0.644	-0.404	-0.176	-0.011	0.008	0.795	-0.033	-0.035	0.043
11	1.	0.718	0.282	0.329	0.679	-0.356	-0.105	-0.059	0.079	0.794	0.048	0.023	0.024
12	1.	0.804	0.196	0.494	0.365	0.636	-0.091	-0.115	0.076	-0.026	0.830	-0.043	0.039
13	1.	0.595	0.415	0.534	0.291	0.569	0.036	-0.017	-0.005	-0.017	0.627	0.064	0.139
14	1.	0.531	0.449	0.579	0.352	0.225	-0.006	0.148	0.004	0.178	0.426	0.002	0.233
15	1.	0.531	0.449	0.527	0.150	0.055	0.062	0.331	0.020	0.093	0.166	0.045	0.45
16	1.	0.711	0.289	0.613	-0.036	-0.063	-0.013	0.510	0.164	-0.024	-0.030	-0.073	0.592
17	1.	0.454	0.546	0.569	0.186	-0.030	0.195	0.239	-0.049	0.143	0.125	0.173	0.374

0.717 0.218 [illegible] 0.842 0.806

9 17 5 1 2 1 0.233 31.000 0.067 5.969 1.660 1.397 0.794 0.569

1.174 0.996 27.303 1.000

1	1.	0.338	0.662	0.476	-0.121	0.026	0.169	0.259	-0.054	-0.051	0.015	0.172	0.393
2	1.	0.204	0.796	0.426	-0.013	0.075	0.069	0.107	0.011	0.039	0.122	0.106	0.229
3	1.	0.815	0.185	0.753	-0.376	-0.144	-0.341	-0.103	0.667	-0.019	0.021	0.041	0.028
4	1.	0.833	0.167	0.773	-0.377	-0.113	-0.289	-0.165	0.653	-0.075	0.057	0.109	-0.013
5	1.	0.755	0.245	0.734	-0.229	-0.204	-0.319	-0.140	0.645	0.096	-0.008	0.070	-0.014
6	1.	0.723	0.277	0.669	-0.175	-0.139	0.436	-0.138	0.034	0.015	0.030	0.670	0.001
7	1.	0.625	0.375	0.657	-0.069	-0.203	0.373	-0.091	0.075	0.134	-0.038	0.579	0.074
8	1.	0.509	0.491	0.582	-0.227	-0.133	0.281	-0.144	0.127	-0.034	-0.006	0.519	0.007
9	1.	0.583	0.417	0.387	0.674	-0.178	-0.002	-0.063	-0.023	0.706	0.069	0.076	0.015
10	1.	0.650	0.350	0.305	0.690	-0.265	-0.105	-0.006	0.019	0.796	-0.030	-0.036	0.026
11	1.	0.720	0.280	0.407	0.705	-0.229	-0.054	-0.041	0.007	0.799	0.037	0.034	0.029
12	1.	0.734	0.266	0.519	0.185	0.667	-0.064	-0.220	0.013	-0.027	0.919	-0.046	0.041
13	1.	0.527	0.473	0.565	0.116	0.500	0.030	-0.112	-0.007	-0.013	0.622	0.056	0.137
14	1.	0.426	0.574	0.524	0.273	0.343	-0.021	0.044	0.017	0.192	0.423	0.012	0.255
15	1.	0.513	0.487	0.654	0.055	0.031	0.006	0.273	0.030	0.173	0.147	0.035	0.443
16	1.	0.796	0.204	0.672	-0.164	-0.016	-0.135	0.450	0.188	-0.013	-0.040	-0.087	0.535
17	1.	0.434	0.566	0.616	0.084	0.036	0.120	0.133	-0.021	0.165	0.109	0.162	0.352

0.519 0.913 0.160 0.465 0.820

DATA SET 9 (cont.)

9 17 5 1 3 1 0.949 18.000 0.067 10.144 2.481 1.668 1.226 1.082

1.161 0.906 26.000 1.000

1	1.	0.792	0.209	0.571	-0.191	0.057	-0.591	0.364	0.007	-0.015	-0.020	0.777	0.025
2	1.	0.314	0.646	0.441	-0.039	0.094	-0.274	0.191	0.067	0.061	0.103	0.417	0.005
3	1.	0.797	0.261	0.721	-0.371	-0.163	0.343	0.146	0.702	-0.022	0.035	-0.010	0.004
4	1.	0.762	0.234	0.737	-0.321	-0.139	0.274	0.143	0.636	-0.029	0.048	0.020	0.052
5	1.	0.711	0.281	0.703	-0.224	-0.204	0.309	0.167	0.648	0.080	-0.003	-0.014	0.032
6	1.	0.723	0.277	0.665	-0.210	-0.207	-0.179	-0.403	-0.012	0.009	0.053	0.007	0.653
7	1.	0.667	0.334	0.654	-0.303	-0.273	-0.127	-0.368	0.027	0.127	0.016	-0.029	0.611
8	1.	0.641	0.519	0.577	-0.249	-0.175	-0.147	-0.199	0.097	-0.039	-0.003	0.093	0.444
9	1.	0.579	0.421	0.192	0.626	-0.181	-0.152	0.019	-0.024	0.709	0.076	0.040	0.060
10	1.	0.642	0.354	0.310	0.646	-0.255	0.351	0.096	0.054	0.785	-0.004	-0.024	-0.031
11	1.	0.719	0.281	0.413	0.697	-0.229	-0.021	0.065	0.022	0.805	0.049	0.038	0.024
12	1.	0.659	0.341	0.523	0.169	0.587	0.088	-0.115	0.014	-0.004	0.748	-0.012	-0.026
13	1.	0.605	0.395	0.575	0.139	0.491	0.363	-0.147	0.020	-0.011	0.672	0.011	0.066
14	1.	0.533	0.467	0.517	0.215	0.271	0.171	-0.053	0.128	0.210	0.502	0.025	0.046
15	1.	0.454	0.542	0.663	0.360	0.073	0.063	0.024	0.260	0.161	0.281	0.083	0.047
16	1.	0.510	0.430	0.656	-0.167	0.001	0.059	0.221	0.430	0.043	0.120	0.219	-0.023
17	1.	0.403	0.503	0.621	0.067	0.903	0.316	-0.082	0.162	0.168	0.231	0.033	0.200

0.305 0.714 0.667 0.896 0.922

6 17 5 2 1 1 1.000 16.000 0.350 4381.913 1859.434 1302.861 1615.612 830.723

1.136 1.441 42.001 1.000

1	1.	0.234	0.762	0.676	-0.173	0.061	0.006	0.131	0.312	0.026	0.145	-0.034	0.022
2	1.	0.175	0.425	0.613	0.071	0.324	0.312	0.036	0.153	0.173	0.067	0.077	0.056
3	1.	0.700	0.300	0.728	-0.214	0.077	0.056	-0.337	0.101	0.013	0.033	0.003	0.554
4	1.	0.699	0.301	0.917	-0.216	0.036	0.069	-0.511	-0.013	0.013	0.024	-0.015	0.746
5	1.	0.633	0.367	0.718	-0.203	0.059	0.023	-0.275	0.123	0.011	0.077	0.025	0.466
6	1.	0.699	0.301	0.719	-0.149	-0.529	-0.057	0.220	0.076	0.079	0.356	-0.025	-0.037
7	1.	0.499	0.501	0.605	-0.131	-0.301	-0.136	0.076	0.115	-0.019	0.490	0.103	0.079
8	1.	0.401	0.599	0.563	-0.163	-0.264	-0.012	-0.027	0.057	0.003	0.309	-0.012	0.172
9	1.	0.436	0.564	0.317	0.394	-0.311	-0.437	-0.010	-0.003	0.040	0.073	0.600	0.004
10	1.	0.472	0.528	0.263	0.342	0.137	-0.529	0.002	0.073	-0.015	-0.018	0.660	-0.010
11	1.	0.809	0.191	0.396	0.537	0.095	-0.737	-0.035	0.042	0.023	0.006	0.954	0.019
12	1.	0.999	0.001	0.563	0.553	0.051	0.646	0.090	0.091	0.940	-0.048	-0.045	-0.011
13	1.	0.485	0.515	0.566	0.323	-0.001	0.263	0.101	0.155	0.561	0.067	-0.007	0.010
14	1.	0.417	0.561	0.574	0.251	0.157	0.058	0.127	0.299	0.397	0.010	0.150	0.005
15	1.	0.417	0.584	0.711	0.002	0.141	-0.067	0.140	0.378	0.177	0.395	0.390	0.038
16	1.	0.993	[illegible]	0.776	-0.367	0.403	-0.032	0.307	0.834	-0.302	-0.040	-0.032	-0.008
17	1.	0.344	0.655	0.567	0.041	0.012	-0.179	0.162	0.298	0.153	0.200	0.144	-0.015

1.777 0.796 0.416 0.512 0.903

DATA SET 2 (cont.)

6 17 5 2 2 1 3.951 [illegible] 0.133 6.333 2.214 1.417 1.141 1.048

1.197 0.905 23.600 1.000

1	1.	0.354	0.266	0.517	-0.176	-0.054	-0.552	-0.385	0.011	-0.027	-0.024	0.756	0.143
2	1.	0.701	0.299	0.675	-0.034	-0.141	-0.466	-0.457	0.018	0.060	0.054	0.757	-0.013
3	1.	0.942	0.159	0.745	-0.322	0.149	0.372	-0.150	0.745	-0.025	0.034	-0.010	0.031
4	1.	0.836	0.174	0.767	-0.325	0.142	0.316	-0.117	0.696	-0.030	0.049	0.011	0.087
5	1.	0.833	0.131	0.777	-0.233	0.223	0.376	-0.147	0.732	0.080	-0.012	-0.033	0.040
6	1.	0.778	0.122	0.679	-0.260	0.209	-0.258	0.412	-0.012	0.023	0.078	0.003	0.729
7	1.	0.762	0.238	0.674	-0.687	0.791	-0.227	0.403	-0.000	0.152	0.030	-0.031	0.717
8	1.	0.654	0.142	0.611	-0.292	0.226	-0.256	0.296	0.046	-0.046	-0.015	0.075	0.641
9	1.	0.719	0.191	0.354	0.715	0.717	-0.049	-0.026	-0.036	0.803	0.075	0.039	0.034
10	1.	0.770	0.233	0.315	0.756	0.190	0.079	-0.095	0.062	0.856	-0.013	-0.028	-0.035
11	1.	0.786	0.216	0.415	0.742	0.734	0.003	-0.066	0.024	0.852	0.057	0.027	0.039
12	1.	0.778	0.277	0.522	0.176	-0.665	0.103	0.144	0.010	-0.007	0.831	-0.024	-0.028
13	1.	0.750	0.250	0.567	0.114	-0.597	0.032	0.145	-0.002	-0.021	0.781	0.005	0.087
14	1.	0.640	0.160	0.645	0.254	-0.354	0.077	0.070	0.119	0.226	0.602	0.030	0.054
15	1.	0.531	0.493	0.562	0.055	-0.114	0.071	-0.366	0.285	0.170	0.316	0.117	0.100
16	1.	0.619	0.381	0.684	-0.185	-0.309	0.302	-0.324	0.527	0.032	0.083	0.301	-0.056
17	1.	0.651	0.330	0.655	0.354	-0.021	-0.139	0.137	0.125	0.216	0.274	0.033	0.296

0.511 0.216 0.855 0.893 0.908

7 17 6 2 3 1 0.946 27.330 0.130 9.043 2.196 1.923 1.564 1.444

1.361 0.454 35.[illegible] 1.000

1	1.	0.739	0.261	0.515	-0.186	-0.362	-0.574	-0.325	0.068	-0.034	-0.043	0.752	0.133
2	1.	0.709	0.291	0.469	-0.067	-0.135	-0.615	-0.302	-0.029	0.040	0.040	0.754	0.073
3	1.	0.764	0.236	0.733	-0.332	0.141	0.295	-0.092	0.657	-0.054	-0.005	-0.045	0.245
4	1.	0.743	0.247	0.752	-0.334	0.141	0.228	-0.040	0.599	-0.057	0.014	-0.020	0.315
5	1.	0.729	0.275	0.724	-0.249	0.223	0.287	-0.081	0.626	0.052	-0.051	-0.068	0.273
6	1.	0.746	0.254	0.475	-0.213	0.272	-0.193	0.394	0.011	0.052	0.071	0.051	0.728
7	1.	0.707	0.293	0.678	-0.102	0.306	-0.139	0.354	0.056	0.186	0.017	0.013	0.630
8	1.	0.714	0.216	0.667	-0.299	0.344	-0.244	0.357	-0.009	-0.025	-0.006	0.110	0.735
9	1.	0.726	0.276	0.390	0.707	0.241	-0.089	0.021	-0.026	0.810	0.057	0.034	0.094
10	1.	0.757	0.248	0.314	0.741	0.311	0.039	-0.090	0.077	0.854	-0.041	-0.041	-0.021
11	1.	0.757	0.331	0.414	0.725	0.264	-0.041	-0.032	0.043	0.841	0.032	0.021	0.053
12	1.	0.766	0.234	0.518	0.197	-0.617	0.062	0.251	0.017	-0.022	0.815	-0.035	-0.038
13	1.	0.750	0.251	0.567	0.110	-0.567	-0.104	0.276	0.021	-0.033	0.767	0.000	0.092
14	1.	0.657	0.351	0.671	0.266	-0.366	0.379	0.135	0.186	0.211	0.593	0.007	0.030
15	1.	0.611	0.387	0.711	0.069	-0.139	0.174	-0.363	0.538	0.168	0.247	0.117	-0.068
16	1.	0.717	0.288	0.644	-0.193	-0.311	0.118	-0.424	0.660	0.006	0.017	0.272	-0.072
17	1.	0.511	0.549	0.688	0.113	-0.336	0.128	-0.088	0.409	0.243	0.219	0.051	0.087

1.025 0.164 0.422 0.963 0.828

DATA SET 1C

10	3	1	1	1	0.999	8.000	0.017	10829.321	3583.879	3583.879

0.826	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.818	0.668	5.000	4.000
0.818	0.668	5.000	5.000
0.818	0.668	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	4.000	16.000
0.817	0.667	3.000	17.000
0.817	0.667	2.000	18.000
0.817	0.667	3.000	19.000
0.817	0.667	2.000	20.000

1	1.	0.999	0.001	0.754	0.650	0.099	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	0.511	-0.269	-0.001	0.706	0.706
3	1.	0.999	0.001	0.754	0.294	-0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	-0.247	-0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.815	-0.483	-0.308	0.706	0.706	-0.001
6	1.	0.999	0.001	0.754	-0.655	0.039	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	-0.403	0.518	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	-0.022	0.577	0.706	-0.001	0.706
9	1.	0.999	0.001	0.754	0.361	0.548	0.382	-0.001	0.923

0.667 0.667 0.667

DATA SET 10 (cont.)

10 2 3 1 2 1 0.999 10.000 0.033 5.415 1.792 1.792

0.826	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.818	0.668	5.000	4.000
0.818	0.664	5.000	5.000
0.818	0.663	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	3.000	16.000
0.817	0.667	2.000	17.000
0.817	0.667	3.000	18.000
0.817	0.667	2.000	19.000
0.817	0.667	3.000	20.000

1	1.	0.999	0.001	0.754	-0.659	-0.099	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	-0.511	0.269	-0.001	0.706	0.706
3	1.	0.999	0.001	0.754	-0.294	0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	0.247	0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.816	0.488	0.308	0.706	0.706	-0.001
6	1.	0.999	0.001	0.754	0.655	-0.039	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	0.403	-0.518	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	0.023	-0.577	0.706	-0.001	0.706
9	1.	0.999	0.001	0.754	-0.361	-0.548	0.382	-0.001	0.923

0.667 0.667 0.667

DATA SET 10 (cont.)

10 9 3 1 3 1 0.993 10.000 0.033 5.417 1.793 1.793

0.828	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.818	0.668	5.000	4.000
0.818	0.668	5.000	5.000
0.818	0.668	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	4.000	16.000
0.817	0.667	3.000	17.000
0.817	0.667	2.000	18.000
0.817	0.667	3.000	19.000
0.817	0.667	2.000	20.000

1	1.	0.999	0.001	0.754	0.650	-0.090	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	0.511	0.269	-0.001	0.706	0.706
3	1.	0.999	0.001	0.754	0.294	0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	-0.247	0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.816	-0.488	0.308	0.706	0.706	-0.001
6	1.	0.999	0.001	0.754	-0.655	-0.033	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	-0.403	-0.519	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	-0.023	-0.577	0.706	-0.001	0.706
9	1.	0.999	0.001	0.754	0.361	-0.548	0.382	-0.001	0.923

0.667 0.667 0.667

DATA SET 10 (cont.)

10 9 3 2 1 1 0.999 3.000 0.033 10829.422 3584.578 3584.578

0.828	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.818	0.668	5.000	4.000
0.818	0.668	5.000	5.000
0.818	0.669	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	4.000	16.000
0.817	0.667	3.000	17.000
0.817	0.667	2.000	18.000
0.817	0.667	3.000	19.000
0.817	0.667	2.000	20.000

1	1.	0.999	0.001	0.754	0.650	0.090	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	0.511	-0.269	-0.001	0.707	0.707
3	1.	0.999	0.001	0.754	0.294	-0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	-0.247	-0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.816	-0.489	-0.303	0.707	0.707	-0.001
6	1.	0.999	0.001	0.754	-0.655	0.039	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	-0.403	0.518	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	-0.022	0.577	0.707	-0.001	0.707
9	1.	0.999	0.001	0.754	0.361	0.548	0.382	-0.001	0.923

0.667 0.667 0.667

DATA SET 10 (cont.)

10	9	3	2	2	1	[illegible]	3.000	0.050	5.415	1.792	1.792

0.828	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.816	0.668	5.000	4.000
0.818	0.668	5.000	5.000
0.818	0.668	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	3.000	16.000
0.817	0.667	2.000	17.000
0.817	0.667	3.000	18.000
0.817	0.667	2.000	19.000
0.817	0.667	3.000	20.000

1	1.	0.999	0.001	0.754	-0.650	0.090	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	-0.511	-0.263	-0.001	0.706	0.706
3	1.	0.999	0.001	0.754	-0.293	-0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	0.247	-0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.816	0.489	-0.303	0.706	0.705	-0.001
6	1.	0.999	0.001	0.754	0.655	0.039	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	0.403	0.519	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	0.022	0.577	0.706	-0.001	0.706
9	1.	0.999	0.001	0.754	-0.362	0.547	0.382	-0.001	0.923

0.667	0.667	0.667

DATA SET 1C (cont.)

10	4	3	2	3	1	0.999	3.000	0.017	5.417	1.793	1.793

0.828	0.676	60.000	1.000
0.821	0.670	9.000	2.000
0.819	0.669	4.000	3.000
0.818	0.669	5.000	4.000
0.818	0.668	5.000	5.000
0.818	0.668	5.000	6.000
0.817	0.667	5.000	7.000
0.817	0.667	5.000	8.000
0.817	0.667	5.000	9.000
0.817	0.667	4.000	10.000
0.817	0.667	5.000	11.000
0.817	0.667	4.000	12.000
0.817	0.667	4.000	13.000
0.817	0.667	4.000	14.000
0.817	0.667	4.000	15.000
0.817	0.667	4.000	16.000
0.817	0.667	3.000	17.000
0.817	0.667	2.000	18.000
0.817	0.667	3.000	19.000
0.817	0.667	2.000	20.000

1	1.	0.999	0.001	0.754	0.650	0.039	-0.001	0.382	0.923
2	1.	0.999	0.001	0.816	0.511	-0.267	-0.001	0.707	0.707
3	1.	0.999	0.001	0.754	0.293	-0.587	-0.001	0.923	0.382
4	1.	0.999	0.001	0.754	-0.248	-0.608	0.382	0.923	-0.001
5	1.	0.999	0.001	0.816	-0.487	-0.303	0.707	0.707	-0.001
6	1.	0.999	0.001	0.754	-0.655	0.040	0.923	0.382	-0.001
7	1.	0.999	0.001	0.754	-0.402	0.518	0.923	-0.001	0.382
8	1.	0.999	0.001	0.816	-0.022	0.577	0.707	-0.001	0.707
9	1.	0.999	0.001	0.754	0.362	0.547	0.382	-0.001	0.923

0.667 0.667 0.667

DATA SET 11

11	9	1	1	1	1	0.999	13.000	0.017	14.720
1	1.	0.558	0.342	0.811					
2	1.	0.661	0.339	0.813					
3	1.	0.228	0.772	0.477					
4	1.	0.168	0.832	0.410					
5	1.	0.454	0.546	0.674					
6	1.	0.800	0.200	0.894					
7	1.	0.705	0.295	0.840					
8	1.	0.434	0.566	0.659					
9	1.	0.703	0.297	0.838					
11	9	1	1	2	1	0.998	9.000	0.033	4.810
1	1.	0.653	0.347	0.808					
2	1.	0.659	0.341	0.812					
3	1.	0.224	0.776	0.473					
4	1.	0.169	0.831	0.411					
5	1.	0.452	0.548	0.672					
6	1.	0.801	0.199	0.895					
7	1.	0.710	0.290	0.843					
8	1.	0.434	0.566	0.659					
9	1.	0.707	0.293	0.841					
11	9	1	1	3	1	0.997	7.000	0.033	9.000
1	1.	0.638	0.362	0.799					
2	1.	0.656	0.344	0.810					
3	1.	0.215	0.785	0.463					
4	1.	0.166	0.834	0.407					
5	1.	0.467	0.533	0.694					
6	1.	0.803	0.197	0.896					
7	1.	0.724	0.276	0.851					
8	1.	0.434	0.566	0.659					
9	1.	0.721	0.279	0.849					

DATA SET 11 (cont.)

11	9	1	2	1	1	1.000	20.000	0.017	2005.944
1	1.	0.505	0.495	0.711					
2	1.	0.505	0.495	0.711					
3	1.	0.185	0.815	0.431					
4	1.	0.130	0.870	0.360					
5	1.	0.410	0.590	0.641					
6	1.	0.999	0.001	1.000					
7	1.	0.579	0.421	0.761					
8	1.	0.326	0.674	0.571					
9	1.	0.579	0.421	0.761					

11	9	1	2	2	1	0.925	4.000	0.017	5.196
1	1.	0.693	0.307	0.832					
2	1.	0.697	0.303	0.835					
3	1.	0.285	0.715	0.534					
4	1.	0.221	0.779	0.470					
5	1.	0.523	0.477	0.723					
6	1.	0.800	0.200	0.895					
7	1.	0.737	0.263	0.858					
8	1.	0.505	0.495	0.711					
9	1.	0.734	0.266	0.857					

11	9	1	2	3	1	0.953	8.000	0.017	9.000
1	1.	0.645	0.355	0.803					
2	1.	0.654	0.346	0.809					
3	1.	0.344	0.656	0.587					
4	1.	0.305	0.695	0.552					
5	1.	0.522	0.478	0.722					
6	1.	0.753	0.247	0.868					
7	1.	0.698	0.302	0.836					
8	1.	0.502	0.458	0.708					
9	1.	0.656	0.304	0.834					

12	5	1	1	1	1	0.981	100.000	0.017	801.268
1	1.	0.959	0.001	0.999					
2	1.	0.883	0.117	0.945					
3	1.	0.705	0.295	0.840					
4	1.	0.539	0.461	0.734					
5	1.	0.396	0.604	0.630					

12	5	1	1	2	1	0.985	11.000	0.017	3.351
1	1.	0.999	0.001	1.000					
2	1.	0.822	0.178	0.907					
3	1.	0.643	0.352	0.905					
4	1.	0.495	0.505	0.704					
5	1.	0.363	0.637	0.603					

12	5	[illegible]	1	3	1	0.987	8.000	0.017	5.031
1	1.	0.999	0.001	1.000					
2	1.	0.814	0.186	0.902					
3	1.	0.643	0.357	0.892					
4	1.	0.453	0.537	0.702					
5	1.	0.362	0.638	0.602					

12	5	1	2	1	1	1.000	5.000	0.017	2012.124
1	1.	0.999	0.001	1.000					
2	1.	0.894	0.106	0.965					
3	1.	0.706	0.294	0.840					
4	1.	0.540	0.46[illegible]	0.735					
5	1.	0.357	0.643	0.630					

12	5	1	2	2	1	0.9[illegible]	4.000	0.017	3.644
1	1.	0.958	0.042	0.994					
2	1.	0.837	0.163	0.915					
3	1.	0.732	0.268	0.855					
4	1.	0.615	0.385	0.784					
5	1.	0.492	0.508	0.701					

12	5	1	2	3	1	0.935	6.000	0.033	5.000
1	1.	[illegible]	[illegible]	0.972					
2	1.	0.769	0.231	0.936					
3	1.	0.71[illegible]	0.291	0.862					
4	1.	0.62[illegible]	0.374	0.791					
5	1.	0.54[illegible]	0.452	0.741					

CHAPTER 13

DISCUSSION AND CONCLUSIONS

13.1 The Six Special Cases

Before discussing the results of the analyses of the twelve data sets it may be useful to relate the special cases of the loss and scaling function parameters to traditional factor analysis techniques. For convenience, we shall construct six five-letter acronyms. The first two letters will indicate the scaling parameter and the last three the loss parameter.

If the scaling parameter is $p = 0$, the scaling matrix involves only the REsidual variance and the first two letters of the acronym for this case will be RE. If the scaling parameter is $p = .5$, the scaling matrix involves the sum of the residual and estimated or common variances which is the TOtal variance, and the first two letters of the acronym for this case will be TO. If the scaling parameter is $p = 1$, the scaling matrix involves only the EStimated or common variances and the first two letters of the acronym for this case will be ES.

If the loss parameter is $P_W = 1$, the loss function involves only the residual COVariances and the last three letters of the acronym for this case will be COV. If the loss parameter is $P_W = 0$, then the loss function involves both residual VAriances and Covariances, equally weighted, and the last three letters of the acronym for this case will be VAC. Thus we shall have the following cases:

$p = 0,$	$P_W = 1.$	RECOV
$p = .5,$	$P_W = 1.$	TOCOV
$p = 1.,$	$P_W = 1.$	ESCOV
$p = 0,$	$P_W = 0$	REVAC
$p = .5,$	$P_W = 0$	TOVAC
$p = 1.,$	$P_W = 0$	ESVAC

RECOV factor analysis is closely associated with maximum likelihood factor analysis developed by Lawley (1940) and with canonical factor analysis developed by Rao (1955). As a matter of fact, the equations to be satisfied by RECOV and the latter two are equivalent. TOCOV factor analysis is closely associated with minres factor analysis developed by Harmon (1967). ESCOV factor analysis is similar to alpha factor analysis developed by Kaiser and Caffrey (1965). REVAC factor analysis has been discussed by Anderson and Rubin (1956) who have pointed out fundamental difficulties with the model. These we have met by the imposition of somewhat unsophisticated computational constraints. TOVAC factor analysis is the same as what many investigators call principal components analysis. Actually, any of the methods of factor analysis which is a special case of the loss and scaling parameters we have discussed may be regarded as a principal components analysis of a real symmetric matrix, whether or not all its roots are non-negative. ESVAC factor analysis, to our knowledge, has been previously discussed only by the author (Horst, 1965).

13.2 Summary of Results

We recall that m is the number of roots of the correlation matrix greater than unity and that for each data set this was the number of factors solved for. We recall also that the criterion ϕ is the ratio of the sum of squares of the m largest roots of a matrix with specified loss and scaling parameters to the sum of squares of all of its roots. The iterations for ϕ continued until the absolute value of the difference between two successive ϕ's was less than .00001 with an upper limit of 100 iterations. The Ψ criterion of simple structure is defined in Chapter 9. The tolerance limit for the simple structure criterion was approximately the same as for ϕ. The actual function used for the tolerance limit is discussed in Chapter 12, Section 2. The iteration limit was 60. The limit on the number of sets of iterations was 20.

Table 1 summarizes results for the twelve data sets.

The first column gives simply the arbitrary serial numbers of the data sets.

The second column gives abbreviated identification of the data sets. The third column gives the number of factors solved for. The next column headed "Crit." (Criterion) gives for each data set first the approximation criterion ϕ and below it the simple structure criterion Ψ. To the right of each ϕ are respectively the number of iterations and the actual ϕ value for the six combinations of loss and scaling parameters. The first six columns following the column of criterion symbols give the data for $P_W = 1$ and the next six columns for $P_W = 0$. Within these sets of six columns, the first pair of columns gives the data for $p = 0$ and the next two for $p - .5$ and $p = 1$ respectively.

13.3 Rankings by Simple Structure Criterion

Perhaps one of the most important questions to be answered is which of the six methods of analysis is the best as judged from the analysis of the twelve sets of data. One overall standard might be based on the simple structure criterion Ψ. Table 2 gives for each of the first nine data sets the rank order of the Ψ value for each of the six combinations of loss and scaling parameters. The first three columns of rankings are for $P_W = 1$ and the last 3 for $P_W = 0$. Within each set of three columns, the first gives the ranking for $p = 0$, and the next two for $p = .5$ and $p = 1$. Rankings for only the first nine of the twelve data sets are given, since the Ψ's for data set 10 are all equal and no Ψ's are given for data sets 11 and 12.

The Σ row following the row for data set 9 gives the sum of the rankings for each pair of loss and scaling parameters. The next row gives the rank order of the sum of the rankings of these sums. The next row H gives the number of data sets for which Ψ had the highest ranking, and the last row L gives the number of data sets for which Ψ had the lowest rank.

It is clear from the last three rows of this table that the best method according to the simple structure criterion is ESCOV for $p = 0$ and $P_W = 1$. This is the alpha factor analysis model of Kaiser and Caffrey (1965). The poorest method is REVAC for $p = 0$ and $P_W = 0$. This is the model discussed by Anderson and Rubin (1956). In view of the problems encountered in this model, it is not surprising that it is poorest according to the simple structure criterion.

For these nine data sets, RECOV with $p = 0$, $P_W = 1$ is second poorest according to rankings of the simple structure criterion. This is the method closely related to the maximum likelihood and canonical models of Lawley (1940) and Rao (1955) respectively.

The methods in second and third place respectively are TOCOV with $p = .5$ and $P_W = 1$, and TOVAC with $p = .5$ and $P_W = 0$. These correspond respectively to the minres model of Harmon (1967) and to the classical principal components model.

Obviously, of course, the procedure we have used for the comparative evaluation of the six models is crude and is based on a very limited number of data sets. Furthermore, the criterion for the number of factors is arbitrary and other criteria may yield different results. In any case, it is quite possible that for any particular data set one may wish to determine the loss and scaling parameters p and P_W so as to maximize the criterion Ψ. Such a procedure need not limit the value of these parameters to those used in this analysis.

13.4 Ranks by Number of Iterations Required

A further procedure for a relative evaluation of the six models may be based on the number of iterations required for ϕ to stabilize to the specified tolerance limit. Table 3 provides an analysis similar to that of Table 2. Here, however, the rankings are for the number of iterations required for ϕ given in Table 1 and all 12 data sets are included. In this ranking we exclude the 2-2 column since this is the principal axis method and except for peculiarities of the computer program, no iterations would be required. In any case, according to the last three rows of Table 3, ESVAC with $p = 1$, $P_W = 0$ is best and ESCOV with $p = 1$, $P_W = 1$ is second best. This latter is the model which came out best in Table 2 based on the simple structure criterion Ψ. The poorest is RECOV with p = 0 and $P_W = 1$, which came out second poorest in Table 2.

Again it is obvious that the rating procedure is crude and based on what some may regard as a questionable criterion for the number of factors. However, a cursory examination of Table 3 shows that in general the number of iterations required for ∅ to stabilize tends to be substantially greater for RECOV than for the other models. It is believed that this tendency would persist even with other defensible criteria for the number of factors.

In view of the marked increase in iterations required for this model over those required for other models and at least some persuasive indications of poor simple structure potentiality, one might question whether this model is to be generally recommended. Since it is closely related to the maximum likelihood and canonical models, one might also question whether the great interest and effort accorded these models in the past is completely justified.

13.5 The Simple Structure Factors

A more detailed examination of the simple structure factor matrices given at the right of the tables in Chapter 12 for data sets 1 through 10 might be of interest. No simple structure matrices were calculated for data sets 11 and 12 since only one factor was obtained. The largest element in each row is underlined for all the simple structure matrices in data sets 1 through 10. For each data set there are six of these, one for each combination of the loss and scaling parameters. (See Chapter 12 for detailed description.) For the first nine data sets these simple structure matrices may be compared with those obtained by other investigators referred to in Chapter 11. Brief comments on the data sets might be of interest as follows:

1. Primary Mental Abilities. For all six models, the simple structure matrices are sharp and agree well with the results of Thurstone and Thurstone (1941).

2. Twenty-four psychological tests. According to the Ψ criterion, ESCOV with p = 1, $P_W = 1$ gives the best simple structure. This model corresponds to Kaiser's (1965) alpha model. A number of simple structure solutions are given by Harmon (1967) for this data set. However, his various solutions involve only four factors whereas ours has five. But all of his simple structure solutions give results easily recognized as similar. Our simple structure for ESCOV gives results similar to his for three of the factors. However, his solutions assign variables 14 through 19 essentially to a single factor, whereas ESCOV splits them into two factors, the first three going to one and the last three to another as follows:

14. Word recognition	17. Object - number
15. Number recognition	18. Number - figure
16. Figure recognition	19. Figure - word

Without referring in detail to a description of the original tests, it is not surprising that recognition of various types of visual stimuli should have a factor in common, and ability to associate pairs involving two different types of stimuli should have another factor in common. It is quite possible, of course, that if Harmon had included a fifth factor in his analysis he also would have found the same factor differentiation between these two triplets of tests. It is interesting to note that our TOCOV solution which corresponds to Harmon's minres does not appear to give as sharp a simple structure for five factors as his does for the four factors on which he uses a direct oblimin solution.

3. Thirty-three variable speed study. Of the six models, ESCOV again gives the highest simple structure criterion for the data from Lord (1956). Lord solved for ten factors by a modification of the maximum likelihood method. Our criterion

for the number of factors yielded only six factors. Lord's rotations were carried out by subjective non-analytical procedures so that his simple structure matrix is not comparable to our ESCOV with $P_W = 1$ and $p = 1$. However, referring to Section 11.3, the verbal, spatial, and number factors come out clearly as they do in Lord's analysis. In addition, a factor common to the two number speed tests (23) and (24) and Lord's reference tests for perceptual speed (25), (26), and (27) appears in our analysis. It is also interesting that in our analysis college grades tend to split, with English (28) going to the verbal factor, Engineering Drawing (30) to the spatial factor, and Foreign Language (29), Chemistry (31), and Mathematics (32) predominately to a factor that we might characterize as a facility with symbolic systems. A factor which Lord failed to find has only a single high loading on Conduct (33) and small positive loadings for the five grade variables (29) through (32). This may be a conformity factor considering the data are based on students in a military academy.

4. Thurstone's twenty-variable box problem. From this classical set of data there is little to choose among the simple structure factor matrices for the six models. As would be expected, three factors were obtained. With the exception of RECOV for $p = 0$, $P_W = 1$, the Ψ values do not differ by more than .001. For RECOV the value is only .003 less than the highest value of .646 for TOCOV, ESCOV, TOVAC, and ESVAC. The simple structure is clear for all cases with the X, X, and Z dimension variables coming out with only a single large loading for a factor and the functions of these variables indicated in Section 11.4 having the loadings that would be expected.

5. Eight-variable body type measures. All six models for this data set, yielding only two factors, give very clear simple structure as has been found by other investigators.

6. Twelve-variable anthropometric measures. In an early analysis of these data, Thurstone (1946) found four simple structure factors by subjective graphical methods whereas our criterion gave only three factors. For all models except RECOV and REVAC whose loss parameter p is 0, the Ψ values are in the high .80's with ESCOV again being highest with Ψ = .880. The simple structures for all six models are clear cut. Thurstone's B and D factors have both loadings of .45 or more on the three variables stature (1), span (5), and hand length (11). In addition, his factor B has high loadings on sitting height (2), and his factor D has a high loading on hand breadth (12). Our first factor tends to collapse these two factors, while our second and third factors are easily recognized as Thurstone's factors C and A respectively.

7. Fifteen variables from Hemmerle. Hemmerle (1965) does not give the source of this matrix nor does he identify the variables. Since he was concerned primarily with a computational procedure for the maximum likelihood factor model, he did not attempt a simple structure transformation. He extracted eight factors but does not state his criterion. Our criterion got only five factors. These data were included in our study primarily because Jöreskog (1967) as well as Horst (1968b) had also worked extensively with them. Both of us had found the data to behave peculiarly and our earlier results for eight variables were markedly different for the maximum likelihood methods of Jöreskog and our corresponding RECOV model. Even in the present study it is the only data set that has its highest Ψ value (.596) for REVAC which, from a theoretical point of view, is the poorest of the six models. Since nothing is known about the identity of the variables, nothing of substantive interest can be said about their simple structure factor loadings.

8. Seventeen-variable data from Bechtold--Sample 1. For this data set our criterion yielded only five factors whereas Bechtold (1961) had deliberately attempted to represent six factors in his battery, as indicated in Section 11.8.

In general, his V, W, S, and N factors come out clearly in all six models. The memory factor for variables 1 and 2 fails to come out clearly in RECOV which has the highest Ψ value, although the reasoning factor R for variables 15, 16, and 17 comes out clearly in this model. The only other model for which R comes out clearly is the suspect REVAC which also fails on the M. It is quite probable that our criterion for number of factors was too low for this data set.

9. Seventeen-variable data from Bechtold--Sample 2. Since the tests in this data set were the same as for data set 8 and the sample was presumably comparable, the results should be substantially the same for the simple structure matrices. As in the previous set, the criterion yielded five factors. For all six models, the V, W, S, and N factors are clearly defined. As in the previous set, the M factor for variables 1 and 2 appears in all models except RECOV and REVAC but somewhat less clearly in TOCOV. The R factor for variables 15, 16, and 17 appears most clearly as a distinct factor in RECOV and TOCOV. Here again, it is highly probable that our criterion for number of factors was too restrictive.

10. Nine-variable synthetic data. The origin or source of this data set is described in detail in Chapter 11, Section 10. The correlation matrix was constructed so that the simple structure factor loading matrix would have three factors and, to three-decimal accuracy, this matrix would be as follows:

	I	II	III
1	000	.383	.924
2	.000	.707	.707
3	.000	.924	.383
4	.383	924	.000
5	.707	.707	.000
6	.924	.383	.000
7	.924	.000	.383
8	.707	.000	.707
9	.383	.000	.924

It can be shown that if one allocates three points on each of the arcs of a right spherical triangle as indicated in Chapter 11, Section 10, then to three decimal places the cosines of the angles of each of these nine points with each of the three vertices of the spherical triangle will be as shown in the matrix above. For some decades we have been trying to find an analytical procedure for recovering this matrix from the correlation matrix of these points. To our knowledge, none of the analytical methods previously available will accomplish this recovery. Reference to Chapter 12 for the results from this data set shows that the simple structure factor matrices for all six models differ at most from the above matrix by .001. For all six models, the sets of simple structure iterations went to the prespecified limit of twenty. For each model the number of iterations for the first set went to the prespecified limit of sixty. Thereafter, however, the number of iterations required for the successive sets diminished rapidly to two or three. It is quite probable that if no limit were placed on the number of sets of iterations, the original simple structure matrix could be recovered to any desired degree of accuracy.

13.6 Improper Solutions

A factor analysis model whose loss function involves only the residual covariances may yield communalities for some tests which exceed unity. Such a result is known as a Heywood case. These factor analysis models are our RECOV, TOCOV, and ESCOV which correspond respectively to Lawley's (1940) maximum likelihood, Harmon's (1967) minres, and Kaiser's (1965) alpha. It is of interest to note that for none of our data sets does our method of computation involving real data give communalities as high as the constrained values of .9995 for any of these three cases. This is not true for Harmon's (1967) minres on data set 2, where he obtains his maximum constrained communality of unity for variable 19.

When an unconstrained solution yields communalities greater than unity, this is sometimes called an improper solution. In the case of maximum likelihood solutions, Jöreskog (1967) observes that, "Experience varifies that improper solutions are found more often than is usually expected." Our RECOV computational algorithms have been applied to some of the data sets on which Jöreskog has applied his computational algorithms for the corresponding maximum likelihood method. In general, where we have used the same number of factors, neither of us has encountered an unconstrained improper solution. However, for the case of data set 7 from Hemmerle for eight factors, Jöreskog's (1967) procedure found it necessary to constrain variables 7 and 15 whereas our (Horst, 1968b) procedure up to 10,000 iterations found no improper communalities. A highly accelerated modification of our procedure did not require the constraining supplements in the computational procedures. Nevertheless, it is not improbable that for a completely adequate factor analysis system, the occurrence of improper communalities would signal either the use of inappropriate loss or scaling parameters, an inappropriate criterion for the number of factors, or some combination of these.

TABLE 1

NO.	DATA	No. of Var.	No. of Fact	Crit.	$P_W = 1$						$P_W = 0$					
					1 - 1		1 - 2		1 - 3		2 - 1		2 - 2		2 - 3	
					RECOV - 0.0		TOCOV - 0.5		ESCOV - 1.0		REVAC - 0.0		TOVAC - 0.5		ESVAC - 1.0	
					Iter.	Crit.	Iter.	Crit.	Iter.	Crit.	Iter.	Crit.	Iter.	Crit.	Iter.	Crit.
1	PMA	9	3	φ	24	1.000	15	1.000	10	.999	16	1.000	4	.969	6	.965
				ψ	11	.959	14	.959	18	.958	15	.953	15	.963	20	.964
2	Psy Test	24	5	φ	53	.993	24	.989	9	.985	20	.999	4	.929	10	.923
				ψ	60	.592	60	.583	60	.661	60	.592	60	.629	60	.597
3	Lord	33	6	φ	20	.999	16	.998	10	.997	13	1.000	4	.969	10	.963
				ψ	53	.536	59	.620	44	.758	50	.646	60	.547	60	.511
4	Box	20	3	φ	31	1.000	8	1.000	8	1.000	15	1.000	3	1.000	3	1.000
				ψ	60	.643	60	.646	60	.646	37	.645	60	.646	60	.646
5	Body Types	8	2	φ	71	.999	14	.999	9	.999	11	1.000	4	.979	6	.974
				ψ	13	.984	14	.989	24	.990	18	.970	15	.989	24	.989
6	Anthro	12	3	φ	100	.995	15	.981	11	.975	9	1.000	4	.891	9	.869
				ψ	29	.791	12	.877	18	.880	31	.659	13	.874	21	.868
7	Hemmerle	15	5	φ	92	.993	35	.981	12	.978	10	.999	4	.884	11	.879
				ψ	60	.569	24	.500	48	.496	47	.596	60	.469	60	.476
8	Bechtold - 1	17	5	φ	71	.998	16	.994	14	.994	13	1.000	4	.958	12	.956
				ψ	18	.875	25	.848	25	.840	45	.843	17	.846	19	.837
9	Bechtold - 2	17	5	φ	58	.998	31	.993	18	.989	14	1.000	4	.953	27	.946
				ψ	26	.861	37	.864	26	.906	42	.841	23	.904	25	.858
10	Synthetic	9	3	φ	8	.999	10	.999	10	.999	3	.999	3	.999	3	.999
				ψ	60+	.667	60+	.667	60+	.667	60+	.667	60+	.667	60+	.667
11	Davis	9	1	φ	13	.999	9	.998	7	.997	20	1.000	4	.925	8	.853
				ψ												
12	Thomson	5	1	φ	100	.981	11	.985	8	.987	5	1.000	4	.953	6	.935
				ψ												

TABLE 2

SIMPLE STRUCTURE CRITERION RANKS

	$P_W = 1$			$P_W = 0$		
Data Sets	RECOV 1-1	TOCOV 1-2	ESCOV 1-3	REVAC 2-1	TOVAC 2-2	ESVAC 2-3
1	3½	3½	2	1	5	6
2	2½	1	6	2½	5	4
3	2	4	6	5	3	1
4	1	4½	4½	2	4½	4½
5	2	4	6	1	4	4
6	2	5	6	1	4	3
7	5	4	3	6	1	2
8	6	5	2	3	4	1
9	3	4	6	1	5	2
Σ	27	35	41½	22½	35½	27½
Rank	2	5	6	1	4	3
H	1	1	5	1	1	2
L	1	1	0	4	1	2

TABLE 3

RANKINGS BY NUMBER OF ITERATIONS REQUIRED

Data Sets	RECOV 1-1	TOCOV 1-2	ESCOV 1-3	REVAC 2-1	TOVAC 2-2	ESVAC 2-3
1	6	4	3	5	1	2
2	6	5	2	4	1	3
3	6	5	2½	4	1	2½
4	6	3½	3½	5	1½	1½
5	6	5	3	4	1	2
6	6	5	4	2½	1	2½
7	6	5	4	2	1	3
8	6	5	4	3	1	2
9	6	5	3	2	1	4
10	4	5½	5½	2	2	2
11	5	4	2	6	1	3
12	6	5		2	1	3
Σ	69	57	40½	41½	13½	30½
Rank	1	[illegible]	4	3	6	5
H	11	0	0	1	0	0
L	0	0	0	0	12	0

CHAPTER 14

COMPUTER PROGRAMS

The Fortran IV computer programs for carrying out the analyses of the previous chapters consist of a main program (MAIN) and overlay subroutine subprograms called by the main program. The overlay subroutines are called SYMI, JACS3, JACS, RARE, SIMP, and DUPLI.

14.1 MAIN

The main program provides parameter values required for the computations, an outer loop for the data sets, an intermediate loop for the loss parameter, an inner loop for the scaling parameter, and a call to the output overlay subroutine DUPLI.

The parameters. It is standard practice to read in parameters from cards along with the data cards. Particularly is this true if the program deck is a binary deck. It is our opinion that binary program decks are essentially obsolete, especially with the rapid compilers currently available. It is usually desirable to have the source program immediately available with the output of a given computer run, together with all the program parameters and option codes that were used in the computer run. We have been repeatedly frustrated in attempting to assist laymen in the interpretation of their computer output by the fact that they used binary program decks and therefore could provide no information about the program parameters, option codes, and the computing algorithms utilized.

If a source program deck such as Fortran IV is used, it is possible to read in program parameters and option code cards as data and these cards can be varied to suit the requirements of the investigator and his data. However, it may be convenient in research with various data analysis models to provide some of this information in program statements so that they may be readily found at the beginning of the program listing. Some of these values are given at the beginning of MAIN. A number of them are repeated with different numberical values. The last time the replacement statement appears for a parameter variable is of course the value it takes in the program. It has been found convenient for research purposes to provide a number of values which may be changed merely by changing the position of the statement.

The parameters area as follows:

P	tolerance limit
LIB	beginning indexing parameter for loss parameter
LIE	ending indexing parameter for loss parameter
LB	beginning indexing parameter for scaling parameter
LE	ending indexing parameter for scaling parameter
NL	iteration limit for simple structure iterations
NF1	ending indexing parameter for row scaling option of factor matrix
KKL	iteration limit for principal axis solution
EE	Tolerance limit for specificity variance

The outer loop. This is the loop with the index LLL and the indexing parameters 1, NP. This locp controls the number of data sets processed in a given run. The data for each set consists of the number of variables in the set, the format of the correlation matrix, and the correlation matrix itself. The loop calls the subroutine SYMI which provides initial estimates of the residual variances and JACS3 which determines the number of factors.

The intermediate loop. This is the loop with the index LLI and indexing parameters LIB, LIE. It calculates the loss parameter P_W. In this program the calculation of only $P_W = 1$ and $P_W = 0$ are provided for but any desired intermediate values could be provided with slight modification.

The inner loop. This loop has the index LL and the indexing parameters LB, LE. It writes the parameters LLL, N, LI, LLI, LL, and NF1 on scratch tape. It calculates functions of the scaling parameter p which are used in the calculation of the scaling matrix. In this program only three loss function parameters are provided for. These are p = 0, p = .5, and p = 1. However, as in the case of the loss parameter, any desired intermediate values could be provided with slight modification.

This loop also calls JACS which calculates a first approximation to the basic structure factor matrix and RARE which calculates iteratively the simple descaled matrix from the basic structure factor loading matrix. If, as is usually the case, the number of factors exceeds 1, this loop also calls SIMP which calculates the simple structure factor loading matrix.

DUPLI. This subroutine is outside the outer loop of MAIN. It reads from scratch tape the data that is to be printed and writes it on BCD tape in the format in which the data in Chapter 12 are given.

14.2 SYMI

This overlay subroutine reads in the data, calculates the inverse of the correlation matrix, and then calculates the first approximation to the residual variances.

Data input. A single card giving the number of variables N is read with format (I4). The program has been dimensioned for up to 80 variables. It could probably be extended to 85 and, with some rewriting, to 90. An A-format card giving the format of the correlation matrix is read. The correlation matrix is read. As the program is written, each row of the correlation matrix must begin on a new card. The program assumes that at least the infra-diagonal elements are given. The supra-diagonal elements must either be given or treated as zero. In either case the program then writes the supra-diagonal elements and enters unity in the diagonals. Then the correlation matrix is stored on scratch tape.

Matrix inversion. The program calls a regular subroutine SYMIN to invert the correlation matrix. If SYMIN finds that the correlation matrix is not basic or positive definite, it returns control to SYMI, the overlay subroutine, which shrinks the offdiagonal elements by a factor of .9. This factor is arbitrary. It can be shown that if the offdiagonal elements on any correlation matrix are multiplied by a positive value less than unity, the resulting matrix will be basic and hence have a regular inverse. SYMIN is again called to invert the modified correlation matrix.

Residual variance approximation. The reciprocals of the diagonal elements of the inverse of the correlation matrix are calculated. These provide the first approximation to the residual variances. They are written on scratch tape.

14.3 JACS3

This subroutine reads the correlation matrix from scratch tape on which it was written by SYMI. It calculates, by an adaptation of the Jacobi method, all the roots of the correlation matrix in order of magnitude which are greater than unity. It transmits the number of these roots to common core storage as the number of factors.

14.4 JACS

This overlay subroutine reads the necessary data from scratch tape. It then calculates the first approximation to the modified correlation matrix with specified loss and scaling parameters, and the first approximation to the basic structure matrix.

The data. The correlation matrix is read from scratch tape on which it was written. Without rewinding, the first approximation to the residual variance vector is read from the same tape.

The scaling matrix. The communality variance is calculated. The scaling matrix is calculated as a function of the communality and residual variance vectors and the scaling parameter.

The modified correlation matrix. The correlation matrix is scaled by the scaling matrix. The diagonals of the resulting matrix are adjusted according to the current loss parameter.

The basic structure matrix. Subroutine JACSIM is called. This subroutine calculates the first m principal component or basic structure vectors of the modified correlation matrix where m is the number of roots greater than unity found in Section 14.3. This is the first approximation to the principal axis matrix for a specified loss and scaling parameters. The principal axis matrix is written on scratch tape.

14.5 RARE

This overlay subroutine calculates the descaled principal axis matrix for current loss and scaling parameters. It reads the necessary data from scratch tape. It then calculates a first approximation to a descaled principal axis matrix and a second approximation to the scaling matrix. It calculates iteratively the descaled principal axis matrix for predetermined loss and scaling parameters. It writes output data on scratch tape. Next it effects row sign reversals if needed. Finally, it transfers data to scratch tape.

Input data. The correlation matrix is read from scratch tape. The first approximation to the principal axis factor matrix is read from another scratch tape.

First descaled principal axis matrix. The descaling matrix for the first approximation to the factor loading matrix is calculated. The first approximation to the descaled factor loading matrix is calculated.

The scaling matrix. Second approximations to the communality and residual variance vectors are calculated. A second approximation to the scaling vector is calculated from these two vectors and functions of the scaling parameter.

Successive descaled principal axis matrices. A loop with index KKK and indexing parameters 1, KKL is set up to call iteratively subroutine RARED. This subroutine calculates successive approximations to the descaled principal axis matrix f for the loss and scaling parameters determined within the inner loop of MAIN. The computations are carried out by the algorithms indicated in Chapter 8. The subroutine includes a constraint to keep the residual variances positive. It also calculates the criterion ∅ of Chapter 12 and the difference between two successive ∅'s as a convergence tolerance.

Output data. The final ∅ value, the number of iterations taken, and the total time in seconds are written on the scratch tape which will subsequently be read back for output. The first m roots of the final modified correlation matrix are also written on this tape.

Sign reversals. The first element in each row of the final descaled principal axis matrix is checked for sign. Sign reversals by row are made where necessary.

Transfers of output data to tape. The final descaled principal axis matrix, together with the sign vector and the final communality and residual variance vectors, are written on the scratch tape for output data. The final descaled principal axis matrix is also written on another scratch tape to be read subsequently for further operations.

14.6 SIMP

This overlay subroutine calculates the simple structure factor loading matrix It provides parameter values and options of row scaling for the descaled principal axis matrix. It has a major outer and an inner iteration loop for calculating the simple structure matrix. It writes the output data on the output scratch tape.

Parameter values. The parameter LLE gives the limit on the number of sets of iterations. The parameter ML is used in calculating the F value in Eq. 9.7.

Row scaling option. The program normalizes the principal axis matrix by rows before beginning the simple structure iterations. The final simple structure matrix is denormalized before being written on output tape. This solution is given by using the parameter NF1 = 1 in MAIN. This parameter serves as the end indexing parameter in SIMP for the DO index LLL. If in addition to this solution it is also desired to have a solution without first normalizing by rows, the parameter NF1 = 2 is used in MAIN. The program does not provide for just the non-normalized solution but with slight modification it can be made to do so.

Outer iteration loop. The major outer iteration loop has the index LLL4 with indexing parameters LLB, LLE. This loop provides for successive sets of iterations where the exponent F decreases with each succeeding set. The value F is calculated as a function of the index LLL4 and the parameter ML. For each iteration set, this loop also writes on the output scratch tape the tolerance criterion, the simple structure criterion, the number of iterations, and the number of the iteration set. For each set of iterations, this loop determines whether any vector of simple structure factor loadings has less than m negative values. If so, no further set of iterations is calculated.

Inner iteration loop. This loop has the index LL with the indexing parameters 1, NL. It calculates iteratively the transformation matrix and the simple structure factor matrix by means of the algorithms given in Eqs. 9.57 through 9.71. For each iteration it calls the subroutine SYMI3 which calculates the inverse of a positive definite symmetric matrix. Within this loop also is calculated the criterion value. If two successive values are within the tolerance limit, the iterations are terminated.

<u>The final simple structure matrix</u>. After the successive sets of iterations are terminated, the program recognizes as the simple structure factor matrix the one calculated in the next to last set of iterations, unless only one set was calculated. In the latter case, the matrix calculated in the single set of iterations is recognized as the simple structure matrix. For the calculations beginning with a row normalization of the principal axis factor matrix, the final simple structure matrix is denormalized by rows. In either case, the final simple structure matrix is written on the output scratch tape. The vector of Ψ criterion values for each simple structure factor vector is also written on the output scratch tape.

14.7 DUPLI

This overlay subroutine reads the data on the output scratch tape and writes it on BCD output tape according to the format of the data in Chapter 12. The subroutine has an outer loop with index LS and indexing parameters 1, NS so that NS copies of the output will be printed.

```
      MAIN
      DIMENSION JI(90)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EF,KK3L,HH,KKK
     *,NC,EE1,EE2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIE,LB,LF,JI
      P = .00001
      NP=7
      NP=8
      NP=5
      NP=3
      NP=1
      NP=4
      NP=2
      NP=12
      LB=3
      LIB=2
      LB=2
      LE=2
      LB=1
      LIE=1
      LIB=1
      LIE=2
      LF=1
      LF=3
      NL=30
      NL=100
      NL=60
      NF1=2
      NF1=1
      KKL=10
      KKL=50
      KKL=100
      EE=.005
      EE=.0005
      REWIND 8
      L7=0
      WRITE(6,999)
  999 FORMAT(1H1)
      DO 888 LLL=1,NP
      CALL SYM1
      CALL JACS3
      DO 882 LLI=LIB,LIE
      PW=2-LLI
      DO 881 LL=LB,LF
      WRITE(6,992)LLL,N,LI,LLI,LL,NF1
  992 FORMAT(6I5)
      WRITE(6,997)
  997 FORMAT(//)
      L7=L7+1
      WRITE(8)LLL,N,LI,LLI,LL,NF1
      QD=3-LL
```

```
      PD=PD/2.
      QD=1.-PD
      PQ=1.-2.*PD*QD
      PD=PD/PQ
      QD=QD/PQ
      CALL JACS
      CALL RARE
      WRITE(6,993)
  993 FORMAT(///)
      IF(LI-1)880,881,880
  880 CONTINUE
      CALL SIMP
      JI(L7)=LLA
  881 CONTINUE
  882 CONTINUE
      WRITE(6,999)
  888 CONTINUE
      REWIND 8
      WRITE(6,339)
      CALL DUPLI
      STOP
      END
```

```
$ORIGIN        ALPHA
$IBFTC SYMI11

      SUBROUTINE SYMI
      DIMENSION R(80,80),Y(80,80),A(80)
     *,DE(80)
     *,FM(12)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EE,KK3L,HH,KKK
     *,NC,FF1,FF2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIE,LB,LE,JI
      REWIND 2
      REWIND 3
       REWIND 4
      READ(5,992)N
  992 FORMAT(I4)
      READ(5,991)(FM(I),I=1,12)
  991 FORMAT(12A6)
      DO 502 I=1,N
      READ(5,FM)(R(I,J),J=1,N)
  502 CONTINUE
      DO 4 I=1,N
      DO 2 J=I,N
      R(I,J)=R(J,I)
    2 CONTINUE
      R(I,I)=1.
    4 CONTINUE
      DO 12 I=1,N
      WRITE(2)(R(I,J),J=1,N)
   12 CONTINUE
      IS=0
      CALL SYMIN(R,N,IS)
      IF(IS)60,64,60
   60 CONTINUE
      REWIND 2
      DO 61 I=1,N
      READ(2)(R(I,J),J=1,N)
   61 CONTINUE
      DO 63 I=1,N
      DO 62 J=1,N
      R(I,J)=R(I,J)*.9
   62 CONTINUE
      R(I,I)=1.
   63 CONTINUE
      CALL SYMIN(R,N,IS)
   64 CONTINUE
      DO 501 I=1,N
      DE(I)=1./R(I,I)
  501 CONTINUE
      WRITE(2)(DE(I),I=1,N)
      REWIND 2
      RETURN
      END
```

```
$IBFTC SYMI1
      SUBROUTINE SYMIN (S,N,IS)
      DIMENSION S(80,1)
      N1 = N-1
      DO 04 I = 2,N
      I1 = I-1
      DO 04 J = 1,I1
04    S(I,J) = 0.0
      C = 1.0/SQRT(S(1,1))
      S(1,1) = 1.0
      DO 13  J=1,N
13    S(1,J) = S(1,J) * C
      DO 21  K=2,N
      DO 17  J=1,N
      K1 = K-1
      DO 17  I=1,K1
17    S(K,J) = S(K,J) - S(I,K) * S(I,J)
      IF(-S(K,K))60,61,61
   60 CONTINUE
      C = 1.0/SQRT(S(K,K))
      DO 191  I=1,K1
191   S(I,K) = 0.0
      S(K,K) = 1.0
      DO 21  J=1,N
21    S(K,J) = S(K,J) * C
      DO 30  J=2,N
      J1 = J-1
      DO 30  I=1,J1
      DO 30  K=J,N
30    S(I,J) = S(I,J) + S(K,I) * S(K,J)
      DO 35  J=1,N1
      S(J,J) = S(J,J) **2
      J2 = J+1
      DO 35  I=J2,N
35    S(J,J) = S(J,J) + S(I,J)**2
      S  ,N) = S(N,N)**2
      DO 42  I=1,N1
      I2 = I+1
      DO 42  J=I2,N
42    S(J,I) = S(I,J)
      GO TO 62
   61 CONTINUE
      IS=1
   62 CONTINUE
      RETURN
       END
```

```
$ORIGIN        ALPHA
$IBFTC JACS2
       SUBROUTINE JACS3
       DIMENSION R(160,80),D(80)
       COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EE,KK3L,HH,KKK
      *,NC,FF1,FF2,LL1
      *,PD,QD,PW
      *,NF1
      *,TIM
      *,LI
      *,LLA,NP,LIB,LIE,LB,LE,JI
       DO 53 I=1,N
       READ (2)(R(I,J),J=1,N)
    53 CONTINUE
       REWIND 2
 06    N1 = N+1
 061   N11=N-1
 07    N2 = N*2
 08    DO 10  I=N1, N2
 09    DO 10  J = 1,N
 10    R(I,J) = 0.
 11    DO 12  I=1,N
 111   NI = N + I
 12    R(NI,I) = 1.
       RIM=1.
       DO 36 I = 1,N11
       I1 = I+1
    13 DO 35 L = 1,NL
       AB=0.
       DO 284 J=I1,N
       RIJ=ABS(R(I,J))
       AB=AMAX1(AB,RIJ)
       IF(P-RIJ)40,42,42
    40 CONTINUE
       LR=1
       DR=R(I,I)-R(J,J)
       DRR=DR**2
       AK=SQRT(DRR/(DRR+4.*R(I,J)**2))
       SD=SIGN(1.,DR)
       A=SQRT((1.+SD*AK)/2.)
 22    B = SQRT (1.-A**2)
 221   C = SIGN (1.,R(I,J))
       AC=A*C
       BC=B*C
 23    DO 252 K = 1,N2
       U = R(K,I)*AC   + R(K,J)*B
       R(K,J) = -R(K,I)*BC   + R(K,J)*A
 252   R(K,I) = U
       R(I,I)=R(I,I)*AC+R(J,I)*B
       R(J,J)=-R(I,J)*BC+R(J,J)*A
       R(I,J)=0.
       R(J,I)=0.
       DO 283 K=1,N
       R(I,K)=R(K,I)
       R(J,K)=R(K,J)
   283 CONTINUE
    42 CONTINUE
```

```
 284 CONTINUE
     IF(P-AB)44,43,43
  44 CONTINUE
35   CONTINUF
  43 CONTINUF
     IF(RIM-R(I,I))45,46,46
  45 CONTINUE
     LI=I
  36 CONTINUE
  46 CONTINUE
     DO 332 I=1,LI
332  D(I) = R(I,I)
     RETURN
     FND
```

```
$ORIGIN        ALPHA
$IBFTC JACS1
      SUBROUTINE JACS
      DIMENSION R(160,80),D(80),A(80)
     *,DE(80),DA(80)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,FE,KK3L,HH,KKK
     *,NC,FF1,FF2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIF,LB,LF,JI
        DO 504 I=1,N
      READ(2)(R(I,J),J=1,N)
  504 CONTINUE
      READ(2)(DE(I),I=1,N)
      REWIND 2
      PK=0.
      DO 61 I=1,N
      DA(I)=1.-DE(I)
      A(I)=1./SQRT(PD*DE(I)+QD*DA(I))
      PK=AMAX1(PK,PW*DE(I)*A(I)**2)
   61 CONTINUE
      DO 63 I=1,N
      DO 62 J=1,N
      R(I,J)=A(I)*R(I,J)*A(J)
   62 CONTINUE
      R(I,I)=(1.-PW*DE(I))*A(I)**2+PK
   63 CONTINUE
      CALL JACSIM(R,D,P,N,NL,LI)
      L=LI
      DO 507 J=1,L
      D(J)=SQRT(D(J)-PK)
      DO 505 I=1,N
      IN=I+N
      R(I,J)=R(IN,J)*D(J)
  505 CONTINUE
      WRITE(4)(R(I,J),I=1,N )
  507 CONTINUE
      REWIND 4
      RETURN
      END
```

```
$IBFTC JACSI1
      SUBROUTINE  JACSIM (R,D,P,N,NL,LI)
      DIMENSION R(160,80),D(80)
06    N1 = N+1
061   N11=N-1
07    N2 = N*2
08    DO 10  I=N1, N2
09    DO 10  J = 1,N
10    R(I,J) = 0.
11    DO 12  I=1,N
111   NI = N + I
12    R(NI,I) = 1.
      DO 36 I = 1,N11
      I1 = I+1
   13 DO 35 L = 1,NL
      AB=0.
      DO 284 J=I1,N
      RIJ=ABS(R(I,J))
      AB=AMAX1(AB,RIJ)
      IF(P-RIJ)40,42,42
   40 CONTINUE
      LR=1
      DR=R(I,I)-R(J,J)
      DRR=DR**2
      AK=SQRT(DRR/(DRR+4.*R(I,J)**2))
      SD=SIGN(1.,DR)
      A=SQRT((1.+SD*AK)/2.)
22    B = SQRT (1.-A**2)
221   C = SIGN (1.,R(I,J))
      AC=A*C
      BC=B*C
23    DO 252 K = 1,N2
      U = R(K,I)*AC  + R(K,J)*B
      R(K,J) = -R(K,I)*BC  + R(K,J)*A
252   R(K,I) = U
      R(I,I)=R(I,I)*AC+R(J,I)*B
      R(J,J)=-R(I,J)*BC+R(J,J)*A
      R(I,J)=0.
      R(J,I)=0.
      DO 283 K=1,N
      R(I,K)=R(K,I)
      R(J,K)=R(K,J)
  283 CONTINUE
   42 CONTINUE
  284 CONTINUE
      IF(P-AB)44,43,43
   44 CONTINUE
35    CONTINUE
   43 CONTINUE
      IF(LI-I)45,46,45
   45 CONTINUE
   36 CONTINUE
   46 CONTINUE
      DO 332 I=1,LI
332   D(I) = R(I,I)
      RETURN
      END
```

```
$ORIGIN        ALPHA
$IBFTC RARE1
      SUBROUTINE RARE
      DIMENSION R(80,80),AM(80,30),UM(80,30),WM(110,30)
     *,D(80),U(80)
     *,A(150)
     *,AA(150)
     *,DE(80),DA(80)
     *,UE(80)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EF,KK3L,HH,KKK
     *,NC,FF1,FF2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIE,LB,LE,JI
      TIM1=TIME(2)
      DO 701 I=1,N
      READ(2)(R(I,J),J=1,N)
  701 CONTINUE
      REWIND 2
      DO 702 J=1,L
      READ(4)(AM(I,J),I=1,N)
  702 CONTINUE
      REWIND 4
      DO 63 I=1,N
      DE(I)=1.
      DO 61 J=1,L
      DE(I)=DE(I)+AM(I,J)**2
   61 CONTINUE
      D(I)=1./SQRT(DE(I))
      DO 62 J=1,L
      AM(I,J)=D(I)*AM(I,J)
   62 CONTINUE
      DA(I)=(DE(I)-1.)/DE(I)
      DE(I)=1.-DA(I)
      D(I)=PD*DE(I)+QD*DA(I)
   63 CONTINUE
      LN=L+N
      DO 347 KKK=1,KKL
      CALL RAREO(R,UM,AM,WM,D,N,L,LN,U,KKK,KKL,AL
     *,EF
     *,UF
     *,C2
     *,ALM
     *,PD,PW,QD,DA,DE)
      AKK=KKK
      AA(KKK)=ALM
      A(KKK)=C2
      IF(P-AL)347,347,3471
 347  CONTINUE
 3471 CONTINUE
      WRITE(6,908)(AA(I),I=1,KKK)
      WRITE(6,992)
  992 FORMAT(//)
      WRITE(6,908)(A(I),I=1,KKK)
  908 FORMAT(10F8.4)
```

```
      TIM2=TIME(2)
      TIM=TIM2-TIM1
      WRITE(8)C2,AKK,TIM
      WRITE(8)(WM(I,I),I=1,LI)
      SI=0.
      DO 30 I=1,N
      D(I)=SIGN(1.,AM(I,1))
      SI=SI+D(I)
   30 CONTINUE
      SI=SIGN(1.,SI)
      DO 34 I=1,N
      D(I)=D(I)*SI
      DO 32 J=1,L
      AM(I,J)=AM(I,J)*SI
   32 CONTINUE
      WRITE(8)D(I),DA(I),DE(I),(AM(I,J),J=1,LI)
   34 CONTINUE
      DO 1111 J=1,L
      WRITE(3)(AM(I,J),I=1,N)
 1111 CONTINUE
      REWIND 3
      RETURN
       END
```

```
$IBFTC RARED1
      SUBROUTINE RARED(R,UM,AM,WM,D,N,L,LN,U,KKK,KKL,AL
     *,EE
     *,UE
     *,C2
     *,ALM
     *,PD,PW,QD,CA,DE)
      DIMENSION R(80,1),UM(80,1),AM(80,1),WM(110,1),D(80),U(80)
     *,DE(80),DA(80)
     *,UE(80)
      DO 315 I=1,N
      R(I,I)=1.-PW*DE(I)
      DO 315  J=1,L
  315 UM(I,J) = (AM(I,J) / D(I))
      DO 321  I=1,N
      IL = I + L
      DO 321  J=1,L
      WM(IL,J)=0.
      DO 321  K=1,N
  321 WM(IL,J) = WM(IL,J) + R(I,K) * UM(K,J)
      DO 328 I=1,L
      DO 328 J=I,L
      WM(I,J) = 0.0
      DO 327  K=1,N
      KL = K + L
  327 WM(I,J) = WM(I,J) + WM(KL,I) * UM(K,J)
  328 WM(J,I)=WM(I,J)
      C1=0.
      DO 2 I=1,L
      C1=C1+WM(I,I)
    2 CONTINUE
      DO 336  K=1,L
      S = 1.0/SQRT(WM(K,K))
      DO 331  I=K,LN
  331 WM(I,K) = WM(I,K) * S
      K1 = K + 1
      IF (L-K) 343, 343, 334
  334 DO 336  J=K1,L
      DO 336  I=J,LN
  336 WM(I,J) = WM(I,J) - WM(I,K) * WM(J,K)
  343 CONTINUE
      DO 705 I=1,N
      DE(I)=1.
      IL=I+L
      DO 701 J=1,L
      DE(I)=DE(I)-WM(IL,J)**2
  701 CONTINUE
      IF(EE-DE(I))704,702,702
  702 CONTINUE
      DD=SQRT((1.-EE)/(1.-DE(I)))
      DO 703 J=1,L
      WM(IL,J)=WM(IL,J)*DD
  703 CONTINUE
      DE(I)=EE
  704 CONTINUE
      DA(I)=1.-DE(I)
```

```
      UE(I)=DE(I)
      D(I)=PD*DE(I)+QD*DA(I)
      U(I)=D(I)
  705 CONTINUE
      AL=C2
      HH=0.
      H1=((1.-PW*DE(N))/D(N))**2
      N1=N-1
      DO 11 I=1,N1
      H1=H1+((1.-PW*DE(I))/D(I))**2
      I1=I+1
      DO 11 J=I1,N
      H=R(I,J)
   11 HH=HH+H**2/(D(I)*D(J))
      HH=H1+2.*HH
      C2=C1/HH
      ALM=0.
      DO 711 I=1,N
      IL=I+L
      DO 710 J=1,L
      ALM=AMAX1(ALM,ABS(AM(I,J)-WM(IL,J)))
      AM(I,J)=WM(IL,J)
  710 CONTINUE
  711 CONTINUE
      AL=ABS(AL-C2)
      RETURN
      END
```

```
$ORIGIN        ALPHA
$IBFTC SIMP1
      SUBROUTINE SIMP
      DIMENSION A(80,30),A1(80,30),E(30,30)
     *,B(80,30),S(30,30),H(30,30),D(80)
     *,D1(80)
     *,D2(80)
     *,DD(80)
     *,BC(80,30)
     *,G(80,30)
     *,DL(30)
     *,CB(30)
     *,DF(30)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EE,KK3L,HH,KKK
     *,NC,FF1,FF2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIE,LB,LE,JI
      M=L
      FMM=M
      FN =N
      LLE=2
      LLE=4
      LLE=3
      LLF=NL
      LLB=1
      LLF=9
      LLF=1
      LLF=10
      LLE = 5
      LLF=20
      ML = 4
      ML=3
      ML=1
      ML=2
      NN=0
      DO 41 LLL=1,NF1
      DO2 J=1,M
      READ(3)(A(I,J),I=1,N)
    2 CONTINUE
      REWIND 3
      DO 53 I=1,N
      DD(I)=0.
      DO 51 J=1,M
      DD(I)=DD(I)+A(I,J)**2
   51 CONTINUE
      DD(I)=SQRT(DD(I))
      DO 52 J=1,M
      IF(NN)511,510,511
  510 CONTINUE
      A(I,J)= A(I,J)/DD(I)
  511 CONTINUE
      B(I,J)=A(I,J)
   52 CONTINUE
   53 CONTINUE
```

```
      F1=0.
      DO 42 LLL4=LLB,LLE
      ALL=LLL4
      FM=LLL4*ML
      F=2.*FM/(2.*FM-1.)
      FP1=F+1.
      FFF=1./(F-3.)
      DO 82 J=1,M
      DF(J)=D(J)
      DO 82 I=1,N
      G(I,J)=B(I,J)
   82 CONTINUE
      F1=0.
      DO 20 LL=1,NL
      AL=LL
      DO 4 J=1,M
      D1(J)=0.
      D(J)=0.
      DO 3 I=1,N
      D1(J)=D1(J)+B(I,J)**4
      D(J)=D(J)+ABS(B(I,J))**FP1
    3 CONTINUE
      D(J)=(D1(J)/D(J))**FFF
      D1(J)=D(J)
      DO 4 I=1,N
      B(I,J)=B(I,J)*D(J)
    4 CONTINUE
      DO 7 I=1,N
      D(I)=0.
      DO 6 J=1,M
      D(I)=D(I)+B(I,J)**2
    6 CONTINUE
      DO 7 J=1,M
      A1(I,J)=D(I)*A(I,J)
      BC(I,J)=ABS(B(I,J))**F
    7 CONTINUE
      DO 9 I=1,M
      DO 9 J=1,M
      S(I,J)=0.
      E(I,J)=0.
      DO 8 K=1,N
      S(I,J)=S(I,J)+A(K,I)*A1(K,J)
      E(I,J)=E(I,J)+A(K,I)*BC(K,J)
    8 CONTINUE
    9 CONTINUE
      CALL SYMI3(S,M)
      DO 10 I=1,M
      DO 10 J=1,M
      H(I,J)=0.
      DO 10 K=1,M
      H(I,J)=H(I,J)+S(I,K)*E(K,J)
   10 CONTINUE
      C=0.
      C1=0.
      DO 240 J=1,M
      D(J)=0.
```

```
      DO 23 I=1,M
      D(J)=D(J)+H(I,J)**2
   23 CONTINUE
      D(J)=SQRT(D(J))
      C=C+D(J)
      DO 24 I=1,M
      H(I,J)=H(I,J)/D(J)
   24 CONTINUE
      D(J)=D(J)/C1(J)
      C1=C1+D(J)
  240 CONTINUE
      C=C/FMM
      C1=C1/FMM
      DO 26 J=1,M
      DO 25 I=1,N
      B(I,J)=0.
      DO 251 K=1,M
      B(I,J)=B(I,J)+A(I,K)*H(K,J)
  251 CONTINUE
   25 CONTINUE
   26 CONTINUE
      F2=F1
      F1=C
      IF(P-(ABS(F1-F2))*2.)522,528,528
  522 CONTINUE
   20 CONTINUE
  528 CONTINUE
      LLA=LL+4
      WRITE(8)C,C1,AL,ALL
      F2=F1
      F1=C
      IF(P-(ABS(F1-F2))*2.)700,708,708
  700 CONTINUE
      AM=2.*FMM
      DO 404  J=1,M
      DB(J)=0.
      DO 403 I=1,N
      IF(B(I,J)+P)401,402,402
  401 CONTINUE
      DB(J)=DB(J)+1.
  402 CONTINUE
  403 CONTINUE
      AM=AMIN1(AM,DB(J))
  404 CONTINUE
      IF(FMM-AM)266,266,40
  266 CONTINUE
   42 CONTINUE
   40 CONTINUE
      IF(ALL-1.)702,706,702
  702 CONTINUE
      DO 704 J=1,M
      D(J)=DF(J)
      DO 704 I=1,N
      B(I,J)=G(I,J)
  704 CONTINUE
  706 CONTINUE
```

```
708 CONTINUE
    IF(NN)321,320,321
320 CONTINUE
    DO 34 I =1,N
    DO 34 J =1,M
    B(I,J)=DD(I)*B(I,J)
 34 CONTINUE
321 CONTINUE
    DO 36 I =1,N
    WRITE(8)(B(I,J),J=1,LI)
 36 CONTINUE
    WRITE(8)(D(J),J=1,LI)
    NN=1
 41 CONTINUE
    RETURN
    END
```

```
$IBFTC SYMI2
      SUBROUTINE SYMI3 (S,N)
      DIMENSION S(30,30)
 38   N1 = N-1
 01   DO 04 I = 2,N
 02   I1 = I-1
 03   DO 04 J = 1,I1
 04   S(I,J) = 0.
   10 C = 1./SQRT(S(1,1))
 11   S(1,1) = 1.
 12   DO 13  J=1,N
 13   S(1,J) = S(1,J) * C
 14   DO 21  K=2,N
 15   DO 17  J=1,N
 151  K1 = K-1
 16   DO 17  I=1,K1
 17   S(K,J) = S(K,J) - S(I,K) * S(I,J)
   18 C = 1./SQRT(S(K,K))
 19   DO 191  I=1,K1
 191  S(I,K) = 0.
 192  S(K,K) = 1.
 20   DO 21  J=1,N
 21   S(K,J) = S(K,J) * C
 25   DO 30  J=2,N
 26   J1 = J-1
 27   DO 30  I=1,J1
 29   DO 30  K=J,N
 30   S(I,J) = S(I,J) + S(K,I) * S(K,J)
 31   DO 35  J=1,N1
 32   S(J,J) = S(J,J) **2
 33   J2 = J+1
 34   DO 35  I=J2,N
 35   S(J,J) = S(J,J) + S(I,J)**2
 351  S(N,N) = S(N,N)**2
 39   DO 42  I=1,N1
 40   I2 = I+1
 41   DO 42  J=I2,N
 42   S(J,I) = S(I,J)
      RETURN
      END
```

```
$ORIGIN       ALPHA
$IBFTC DUPLI1
      SUBROUTINE DUPLI
      DIMENSION A(80,30),D(80),DA(80),DE(80),JI(80)
     *,D1(80)
      COMMON P,NL,N,NF,L,KL,KKL,KK2L,NA,E1,EE,KK3L,HH,KKK
     *,NC,FF1,FF2,LL1
     *,PD,QD,PW
     *,NF1
     *,TIM
     *,LI
     *,LLA,NP,LIB,LIE,LB,LE,JI
      NS=6
      NS=4
      NS=1
      NS=2
      DO 26 LS=1,NS
      L7=0
      DO 24 LLL=1,NP
      WRITE(6,999)
  999 FORMAT(1H1)
      DO 22 LLI=LIB,LIE
      DO 20 LL=LB,LE
      WRITE(6,996)
  996 FORMAT(///)
      L7=L7+1
      READ(8)LLL,N,LI,LLI,LL,NF1
      READ(8)C2,AKK,TIM
      READ(8)(D(I),I=1,LI)
      WRITE(6,901)LLL,N,LI,LLI,LL,NF1,C2,AKK,TIM,(D(I),I=1,LI)
  901 FORMAT(6I4,3X,3F7.3,3X,7F10.3)
      WRITE(6,997)
  997 FORMAT(1H )
      DO 2 I=1,N
      READ(8)D1(I),DA(I),DE(I),(A(I,J),J=1,LI)
    2 CONTINUE
      IF(LI-1)8,15,8
    8 CONTINUE
      LLA=JI(L7)
      DO 4 I=1,LLA
      READ(8)C,C1,AL,ALL
      WRITE(6,902)C,C1,AL,ALL
  902 FORMAT(5F7.3)
    4 CONTINUE
      WRITE(6,997)
      DO 14 I=1,N
      READ(8)(D(J),J=1,LI)
      WRITE(6,905)(D(J),J=1,LI)
  905 FORMAT(78X,7F7.3)
      WRITE(6,906)I,D1(I),DA(I),DE(I),(A(I,J),J=1,LI)
  906 FORMAT(1H+,I3,1X,1F4.0,1X,2F7.3,2X,7F7.3)
   14 CONTINUE
      WRITE(6,997)
      READ(8)(D(J),J=1,LI)
      WRITE(6,904)(D(J),J=1,LI)
  904 FORMAT(2X,7F7.3)
      GO TO 18
```

```
 15 CONTINUE
    DO 16 I=1,N
    WRITE(6,903)I,D1(I),DA(I),DE(I),(A(I,J),J=1,1)
903 FORMAT(I3,1X,1F4.0,1X,2F7.3,2X,14F7.3)
 16 CONTINUE
 18 CONTINUE
 20 CONTINUE
 22 CONTINUE
 24 CONTINUE
    WRITE(6,999)
    REWIND 8
 26 CONTINUE
    RETURN
    END
```

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13. ABSTRACT

This document is Part II of a two-part report. In Part I a generalized scale free factor analysis method with variable loss function was developed, and new rationales for simple structure transformation and computation of factor scores were developed. In this report, the techniques are applied to twelve different data sets, including some of the classical sets reported in the literature by other investigators. Computer program listings are included.

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