

Best Linear Unbiased Estimators of the Parameters
of the Logistic Distribution Using Order Statistics

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Mimeograph Series No. 52

August, 1965

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1. Introduction and Summary

The logistic distribution is described by the density function

$$(1.1) \quad f(x; \mu, \sigma) = (1/\sigma') \exp \{ -(x - \mu) / \sigma' \} / [1 + \exp \{ -(x - \mu) / \sigma' \}]^2,$$

where

$$-\infty < x < \infty, \quad -\infty < \mu < \infty \quad \text{and} \quad \sigma' = \frac{\sqrt{3} \sigma}{\pi} > 0.$$

This distribution is symmetrical with mean μ and variance σ^2 .

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The problem of estimating the parameters μ and σ by using ordered observations has been studied by Plackett (1959) for small samples and by Kjelsberg (1962) for sample size $n \leq 5$. For large samples, contributions to the above estimation problem has been made by Gupta and Waknis (1964). The best linear unbiased estimators for the parameters of the normal and the other distributions have been constructed by Sarhan and Greenberg (1956, 1962). But owing to the difficulty of computing the covariances of order statistics, the best linear unbiased estimators of the parameters had not been computed in general.

In this paper, we construct these linear unbiased estimators with a minimum variance based on ordered observations from the complete as well as the censored sample case for sample sizes $n = 2 (1) 25$. The censored sample case consists of the $n - r_1 - r_2$ observations, where r_1 observations are missing in the beginning and r_2 observations are missing at the end. The variances and covariances of these estimators are also evaluated. A table of the variances and covariances of all order statistics for $n = 11 (1) 25$ is also given. Relative efficiencies of these estimators are studied.

2. Best Linear Unbiased Estimators of μ and σ

Let $x_{1,n} \leq x_{2,n} \leq \dots \leq x_{n,n}$ be the n ordered observations from the logistic distribution, with mean μ and variance σ^2 which has the density function (1.1). We are interested in constructing estimators $\hat{\mu}$ and $\hat{\sigma}$ based on the $n - r_1 - r_2$ observations $x_{r_1+1,n} \leq x_{r_1+2,n} \leq \dots \leq x_{n-r_2,n}$, where r_1 observations are missing on the left side and r_2 observations are missing on the right-hand side.

Let the required estimators be

$$(2.1) \quad \hat{\mu} = \sum_{i=r_1+1}^{n-r_2} a_{i,n} x_{i,n},$$

$$(2.2) \quad \hat{\sigma} = \sum_{i=r_1+1}^{n-r_2} b_{i,n} x_{i,n}.$$

The problem is to find the coefficients a_i and b_i such that in the class of linear unbiased estimators, $\hat{\mu}$ and $\hat{\sigma}$ have a minimum variance.

It follows from the condition of unbiasedness that

$$(2.3) \quad \sum a_{i,n} = 1 \quad \text{and} \quad \sum a_{i,n} \mu_1^i(i,n) = 0,$$

$$(2.4) \quad \sum b_{i,n} = 0 \quad \text{and} \quad \sum b_{i,n} \mu_1^i(i,n) = 1,$$

where $\mu_1^i(i,n)$ is the first moment or cumulant of the i th order statistic in a sample of size n from the logistic distribution $L(0,1)$, i.e., the distribution with mean zero and variance unity. It should be pointed out that (2.3) and (2.4) are necessary conditions.

The estimators $\hat{\mu}$ and $\hat{\sigma}$ can be written, using the matrix notation and following the generalized least - squares theory, Lloyd (1952), in the following form:

$$(2.5) \quad \hat{\mu} = - \underline{a}' \Gamma \underline{x},$$

$$(2.6) \quad \hat{\sigma} = \underline{1}' \Gamma \underline{x},$$

where $\underline{x}' = (x_{r_1+1, n}, \dots, x_{n-r_2, n})$,

$$\underline{a}' = (\mu_1' (r_1+1, n), \dots, \mu_1' (n-r_2, n)),$$

$\underline{1}' = (1, \dots, 1)$: $\underline{1}'$ is a vector with $n - r_1 - r_2$ components,

$$\Gamma = [V^{-1} (\underline{1} \underline{a}' - \underline{a} \underline{1}') V^{-1}] / \Delta : \Delta = (\underline{1}' V^{-1} \underline{1}) (\underline{a}' V^{-1} \underline{a}) - (\underline{1}' V^{-1} \underline{a})^2,$$

and where V is the variance-covariance matrix of $n - r_1 - r_2$ appropriate order statistics.

The special case $r_1 = 0, r_2 = 0$ is of importance, since this represents the complete sample case.

The variances and covariances of $\hat{\mu}$ and $\hat{\sigma}$ can be expressed as

$$(2.7) \quad \text{Var} (\hat{\mu}) = (\underline{a}' V^{-1} \underline{a}) \sigma^2 / \Delta,$$

$$(2.8) \quad \text{Var} (\hat{\sigma}) = (\underline{1}' V^{-1} \underline{1}) \sigma^2 / \Delta \quad \text{and}$$

$$(2.9) \quad \text{Cov} (\hat{\mu}, \hat{\sigma}) = - (\underline{1}' V^{-1} \underline{a}) \sigma^2 / \Delta.$$

When $r_1 = r_2 = 0$, the symmetry of the distribution implies that $\text{Cov}(\hat{\mu}, \hat{\sigma}) = 0$.

Thus, for constructing $\hat{\mu}$ and $\hat{\sigma}$, one needs the expected values of $x_{i,n}$, $x_{i,n}^2$ and $(x_{i,n} x_{j,n})$. The first two of these are available in closed form and also numerically in the papers by Plackett (1958), Birnbaum and Dudman (1963) and Gupta and Shah (1965). In a recent paper, the covariances of the order statistics $x_{i,n}$ and $x_{j,n}$ have been expressed in a closed form in terms of digamma and trigamma functions by Shah (1965) where numerical values of these covariances are also given for $n = 2 (1) 10$. Table 1 of this paper gives these covariances for $n = 11 (1) 25$. In Table 2, the coefficients of the estimators for both complete and censored samples are given.

3. Relative Efficiencies of the Estimators For the Uncensored Sample Cases

Now the relative efficiencies of the estimator $\hat{\mu}$ and $\hat{\sigma}$ will be discussed for the uncensored sample cases. In developing various formulae, we will follow the general notation as described in Paragraph 2 for the special case since the uncensored case is simply the one where $r_1 = 0$ and $r_2 = 0$.

The relative efficiency is defined in terms of the reciprocal of the ratio of the variances of these estimators to the lower bound on these variances as obtained by Cramér-Rao inequality. These bounds are:

$$(3.1) \quad \text{Var}(\hat{\mu}) \geq (9/\pi^2) (\sigma^2/n)$$

$$(3.2) \quad \text{Var}(\hat{\sigma}) \geq \{9/(3+\pi^2)\} (\sigma^2/n)$$

Hence

$$(3.3) \quad \text{Rel. Eff. of } \hat{\mu} = (9/n\pi^2) [\Delta / (\underline{\mathbf{a}}' \mathbf{V}^{-1} \underline{\mathbf{a}})],$$

$$(3.4) \quad \text{Rel. Eff. of } \hat{\sigma} = 9/\{n(3+\pi^2)\} [\Delta / (\underline{\mathbf{1}}' \mathbf{V}^{-1} \underline{\mathbf{1}})].$$

We will also study the efficiencies of these estimators as compared with the moment estimators. The moment estimator \bar{x} for μ has the variance σ^2/n and hence

$$(3.5) \quad \text{Rel. Eff. of } \bar{x} = \frac{\text{Var}(\hat{\mu})}{\text{Var}(\bar{x})} = n (\underline{\mathbf{a}}' \mathbf{V}^{-1} \underline{\mathbf{a}}) / \Delta.$$

The moment estimator for σ is $\sqrt{m_2}$ where m_2 is the second sample moment based on n observations. Now

$$(3.6) \quad E(\sqrt{m_2}) = \sigma + O(1/n), \quad \text{Var}(\sqrt{m_2}) = (4/5n) + O(1/n^2).$$

The $\text{Var}(\sqrt{m_2})$ can be better approximated by

$$(3.7) \quad \text{Var}(\sqrt{m_2}) \approx (n-1) (31n - 21) / (20n^3).$$

[The formulae (3.6) and (3.7) are available in Cramér (p. 353), Kendall and Stuart (p. 233, 287) respectively].

Hence,

$$\begin{aligned} (3.8) \quad \text{Rel. Eff. of } \sqrt{m_2} &\approx \text{Var}(\hat{\sigma}) / \text{Var}(\sqrt{m_2}) \\ &= [(20 n^3) / (n-1) (31n-21)] \\ &\quad [(\underline{1}' V^{-1} \underline{1}) / \Delta]. \end{aligned}$$

Table 4 gives the numerical values of relative efficiencies based on (3.3), (3.4), (3.5) and (3.8) for $n = 4(1) 25$. The relative efficiency of the moment estimators decreases as n increases.

It should be pointed out that the variance of $\hat{\mu}$ has a value strictly smaller than σ^2/n , since it has been obtained by constructing a linear compound of the observations with minimal variance and, therefore, it cannot exceed the variance of the particular linear compound which is the sample mean.

4. Relative Efficiencies of the Estimators for the Censored Sample Cases

The efficiencies of the estimators for the censored samples relative to the uncensored samples have also been computed. These relative efficiencies are simply the ratios of the variances of the censored sample estimator to the uncensored sample estimator. Table 3 of this paper gives these efficiencies.

5. Explanation of Tables and Comments on Their Accuracy

The covariances of order statistics were computed using the result

(eq. 33) in Shah (1965), which is,

$$\begin{aligned}
 (5.1) \quad E(x_{i,n}, x_{j,n}) &= E(x_{j,n}^2) + \sum_{k=i}^{j-1} \sum_{t=1}^{k-1} \left[(-1)^{k+i} \right. \\
 &\quad \left. \binom{k-1}{i-1} \binom{n}{k} \binom{j-k+t-1}{t} B(t, n-k+1) \right. \\
 &\quad \left. E(x_{j+t-k, n+t-k}) \right] + \binom{n}{i} \sum_{k=0}^{j-i-1} \left[(-1)^k \right. \\
 &\quad \left. \binom{n-i}{k} \binom{i}{i+k} \{ -\psi^{(1)}(n-j) + \right. \\
 &\quad \left. [\psi^{(0)}(n-j) - \psi^{(0)}(n-i-k)] \right. \\
 &\quad \left. [\psi^{(0)}(j-i-k-1) - \psi^{(0)}(n-j)] \} \right]
 \end{aligned}$$

where $B(p, q)$ is the beta function and $\psi^{(r-1)}(x) = \frac{d^r \log \Gamma(1+x)}{dx^r}$

By using the known result that

$$(5.2) \quad \text{Cov}(x_{i,n}, x_{j,n}) = \text{Cov}(x_{n-j+1}, x_{n-i+1}), \quad i < j,$$

checks were made on the accuracy of the covariances. For this purpose, we put more reliance on that side of (5.2) which had fewer terms for its computation. The computations were carried out in double precision on an IBM 7094 computer at the Purdue Computing Center.

These checks show that our answers are correct to seven decimal places for $n \leq 20$; for n between 21 and 25, they are correct to five decimal places. The variances and covariances of order statistics $N = 11(1)25$ are given in Table 1.

In Table 2, the coefficients of $\hat{\mu}$ are given under "MU" and the coefficients of $\hat{\sigma}$ are given under "SIGMA" for given n , r_1 and r_2 . These coefficients are given to four decimal places. All available checks indicate that these answers are correct to four decimal places except for round-off errors.

Table 3 gives the variances of $\hat{\mu}$ under "VARMU" and the variances of $\hat{\sigma}$ under "VARSIGMA", the $\text{Cov}(\hat{\mu}, \hat{\sigma})$ under "COV MU SIGMA" for given n , r_1 , r_2 . These variances and covariances are given to four decimal places. All available checks indicate that they are correct to four decimal places except for round-off errors. The percentage efficiencies of $\hat{\mu}$ and $\hat{\sigma}$ for censored samples, relative to uncensored samples, are also given in the same table under "RE MU" and "RE SIGMA" respectively.

The entries in Tables 2 and 3 on each page are given in two rectangles. The second rectangle is a continuation of the first one. Each rectangle is divided into several subrectangles (ten in Table 2 and three in Table 3). The entries start in subrectangle #1 of the first rectangle and go down vertically. They start again in subrectangle #2 of the same rectangle and go down vertically and so on.

The relative efficiencies of $\hat{\mu}$ and $\hat{\sigma}$ for the uncensored case for $n = 4$ (1) 25 as discussed in Paragraph 3 are given in Table 4.

Since the actual computer print-out was photo-reduced to obtain Tables 1, 2, 3 and 4, the capital letters are printed out in the tables rather than the small letters which were used in the text; i. e., N, R1, R2, I and J are printed out in place of n , r_1 , r_2 , i and j respectively.

The computations for Tables 2, 3 and 4 were carried out in Fortran IV on an IBM 7094 computer at the Service Bureau Corporation using a general program developed there to compute the coefficients of the linear unbiased estimators of the parameters of a distribution of the form $F(ax + b)$ using order statistics. The algorithm is based on the method given by Lloyd (1952).

6. Numerical Example

Sarhan and Greenberg (1962) discussed an experiment to measure Strontium-90 concentrations in samples of milk; measurements involved readings and calculations. A sample of ten readings was considered but owing to the relatively larger measurement error known to exist at the extremes, it was decided to trim the two smallest and the three largest observations. The observations, when arranged in an ascending order are:

-, -, 8.2, 8.4, 9.1, 9.8, 9.9, -, -, -.

If we assume that the sample was drawn from a logistic distribution, then we will construct the best linear unbiased estimates, $\hat{\mu}$ and $\hat{\sigma}$, of μ and σ , respectively, using Table 2 ($n = 10, r_1 = 2, r_2 = 3$) as follows:

Ordered Observations	Coefficients for $\hat{\mu}$	Coefficients for $\hat{\sigma}$
-	0	0
-	0	0
8.2	0.1524	-0.9306
8.4	0.1324	-0.1744
9.1	0.1538	-0.0498
9.8	0.1615	0.0791
9.9	0.3999	1.0758
-	0	0
-	0	0
-	0	0
<hr/>		
Best Linear Unbiased Estimate	9.3031	1.8765
<hr/>		

From Table 3, we find the percentage efficiencies of the above estimates of μ and σ relative to uncensored sample of size 10 (i. e., $n = 10, r_1 = 0, r_2 = 0$) are 94.20 and 41.88 respectively. It may be interesting to compare our results with those of Sarhan and Greenberg (1965) on the assumption of normal distribution. This comparison is as follows:

	$\hat{\mu}$	$\hat{\sigma}$	Rel. Eff. of $\hat{\mu}$	Rel. Eff. of $\hat{\sigma}$
Logistic	9.3031	1.8765	94.20	41.88
Normal	9.2900	1.6900	84.78	33.62

7. Conclusion

Some noteworthy features of the estimators $\hat{\mu}$ and $\hat{\sigma}$ become evident after studying Tables 2 and 3. They are:

- (a) If the sample size is odd and all the observations are censored except the middle observation and the one immediately following or preceding it, then the middle observation will have all the weight in estimating μ . On the other hand, if the sample size is even and all the observations are censored except the middle two, then the weight of each observation will be one-half in estimating μ . This may be seen from the following abstract of Table 2:

n	r_1	r_2	Coefficients for $\hat{\mu}$
5	2	1	1.0000 0.0000
11	4	5	0.0000 1.0000
25	11	12	0.0000 1.0000
6	2	2	0.5000 0.5000
16	7	7	0.5000 0.5000
24	11	11	0.5000 0.5000

(b) If the sample size is odd and if any number of observations are censored on either side of the middle observation (which is not censored), then the relative efficiency is 76% or better. On the other hand, if the middle observation is censored and no matter how many observations remain uncensored, the relative efficiencies of $\hat{\mu}$ in such cases are less than 76%. Under the same circumstances, the efficiency of $\hat{\mu}$ is 79% or better if the sample size is even and if the middle two observations are not censored. The following abstract of Table 3 shows this:

n	r_1	r_2	Rel. Eff. of $\hat{\mu}$
11	2	5	77.60
	4	5	76.91
	6	0	62.68
	1	6	59.68
17	2	8	77.64
	7	8	76.21
	9	0	68.88
	1	9	67.52
25	2	12	77.78
	11	12	75.81
	16	0	47.07
	1	16	45.18
12	2	5	84.20
	5	5	82.17
	8	0	35.66
	2	8	20.54
18	4	8	81.64
	8	8	79.93
	10	0	64.00
	2	10	60.58

(b) (Con't)

n	r_1	r_2	Rel. Eff. of $\hat{\mu}$
24	3	11	80.70
	11	11	78.75
	13	0	68.02
	1	13	67.04

(c) For any sample size and fixed uncensored number of observations $q = n - (r_1 + r_2)$, we found that under all conditions of censoring, the efficiency of $\hat{\mu}$ attains its maximum whenever the middle observation (if the sample size is odd) or middle two observations (if the sample size is even) is uncensored. This may be seen from the following abstract of Table 3.

n	r_1	r_2	Rel. Eff. of $\hat{\mu}$
20	18	0	2.25
	1	17	3.69
	2	16	5.62
	3	15	8.35
	4	14	12.43
	5	13	18.81
	6	12	29.14
	8	10	67.22
	9	9	79.46
	10	8	67.22
	11	7	45.60
	12	6	29.14

(d) For any sample size and under all conditions of censoring, we found that for any corresponding value of r_2 , the efficiency of $\hat{\sigma}$ decreases by approximately the same amount for each change in the value of r_1 . It may be seen from the following abstract of Table 3:

(d) (Con't)

n	r_1	r_2	Rel. Eff. of $\hat{\sigma}$
20	1	0	95.35
	3	0	84.32
	5	0	72.19
	7	0	59.86
	9	0	47.91
	11	0	36.63

(e) For any sample size and fixed censored number of observations, m ($m = r_1 + r_2$), there is no significant difference in relative efficiency of $\hat{\sigma}$. The following abstract of Table 3 shows this:

n	r_1	r_2	Rel. Eff. of $\hat{\sigma}$
20	16	0	12.15
	1	15	12.44
	2	14	12.61
	3	13	12.73
	4	12	12.81
	5	11	12.86
	6	10	12.89
	7	9	12.91
	8	8	12.92

(NOTE that $m = 16$ in the above abstract)

It is interesting to note that Sarhan and Greenberg (1962) also observed the same features of the estimators $\hat{\mu}$ and $\hat{\sigma}$ on the assumption of the normal distribution.

For uncensored samples, we see from Table 4 that the efficiency of $\hat{\mu}$ and $\hat{\sigma}$, relative to Cramer-Rao lower bound, increases with n while the efficiency of the moment estimators, relative to $\hat{\mu}$, and $\hat{\sigma}$ decreases with n .

8. Acknowledgements

The authors wish to acknowledge the programming assistance of Mrs. L. Lui of Purdue University and Messrs. R. R. Gillus, T. A. Gaffney and G. P. Shah of the Service Bureau Corporation.

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TABLE 1

VARIANCES AND COVARIANCES OF ORDER STATISTICS IN SAMPLE OF SIZES ELEVEN TO TWENTY - FIVE FROM A LOGISTIC DISTRIBUTION

N	I	J	VALUE
11	1	1	0.52892709
	2	1	0.21072902
	3	1	0.12991984
	4	1	0.09371413
	5	1	0.07324781
	6	1	0.06010566
	7	1	0.05095716
	8	1	0.04422355
	9	1	0.03906076
	10	1	0.03497683
	11	1	0.03166572
2	2	2	0.22800317
	3	2	0.14163240
	4	2	0.10259055
	5	2	0.08039948
	6	2	0.06609615
	7	2	0.05611200
	8	2	0.04874793
	9	2	0.04309245
	10	2	0.03861280
3	3	3	0.15576492
	4	3	0.11336736
	5	3	0.08911954
	6	3	0.07342345
	7	3	0.06243250
	8	3	0.05430614
	9	3	0.04805317
4	4	4	0.12674063
	5	4	0.09999408
	6	4	0.08259481
	7	4	0.07036632
	8	4	0.06129909
5	5	5	0.11394624
	6	5	0.09441321
	7	5	0.08062508
6	6	6	0.11023113
12	1	1	0.52641499
	2	1	0.20943498
	3	1	0.12904379
	4	1	0.09305085
	5	1	0.07271378
	6	1	0.05965856
	7	1	0.05057257
	8	1	0.04388610
13	1	1	0.52430414
	2	1	0.20835027
	3	1	0.12831040
	4	1	0.09249604
	5	1	0.07226734
	6	1	0.05928494
	7	1	0.05025130
	8	1	0.04360428
	9	1	0.03850912
	10	1	0.03447948
14	1	1	0.52250554
	2	1	0.20742793
	3	1	0.12768749
	4	1	0.09202513
13	2	2	0.22245145
	3	2	0.13784438
	4	2	0.09970849
	5	2	0.07807115
	6	2	0.06414199
	7	2	0.05402788
	8	2	0.04726802
	9	2	0.04177240
	10	2	0.03742135
	11	2	0.03389110
	12	2	0.03096943
13	3	3	0.14897265
	4	3	0.10816899
	5	3	0.08490261
	6	3	0.06987341
	7	3	0.05936582
	8	3	0.05160621
	9	3	0.04564120
	10	3	0.04091267
	11	3	0.03707223
13	4	4	0.11823856
	5	4	0.09306464
	6	4	0.07674060
	7	4	0.06529527
	8	4	0.05682462
	9	4	0.05030161
	10	4	0.04512338
13	5	5	0.10299347
	6	5	0.08512156
	7	5	0.07255013
	8	5	0.06222246
	9	5	0.05602489
13	6	6	0.09558436
	7	6	0.08163396
	8	6	0.07125244
13	7	7	0.09334427
14	1	1	0.52250554
	2	1	0.20742793
	3	1	0.12768749
	4	1	0.09202513
14	2	2	0.22245145
	3	2	0.13784438
	4	2	0.09970849
	5	2	0.07807115
	6	2	0.06414199
	7	2	0.05402788
	8	2	0.04726802
	9	2	0.04177240
	10	2	0.03742135
	11	2	0.03389110
	12	2	0.03096943
14	3	3	0.14897265
	4	3	0.10816899
	5	3	0.08490261
	6	3	0.06987341
	7	3	0.05936582
	8	3	0.05160621
	9	3	0.04564120
	10	3	0.04091267
	11	3	0.03707223
14	4	4	0.11823856
	5	4	0.09306464
	6	4	0.07674060
	7	4	0.06529527
	8	4	0.05682462
	9	4	0.05030161
	10	4	0.04512338
14	5	5	0.10299347
	6	5	0.08512156
	7	5	0.07255013
	8	5	0.06222246
	9	5	0.05602489
14	6	6	0.09558436
	7	6	0.08163396
	8	6	0.07125244
14	7	7	0.09334427
14	8	8	0.09334427
14	9	9	0.09334427
14	10	10	0.09334427
14	11	11	0.09334427
14	12	12	0.09334427
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14	14	14	0.09334427
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14	16	16	0.09334427
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14	18	18	0.09334427
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14	20	20	0.09334427
14	21	21	0.09334427
14	22	22	0.09334427
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14	57	57	0.09334427
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14	67	67	0.09334427
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14	76	76	0.09334427
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14	78	78	0.09334427
14	79	79	0.09334427
14	80	80	0.09334427
14	81	81	0.09334427
14	82	82	0.09334427
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14	86	86	0.09334427
14	87	87	0.09334427
14	88	88	0.09334427
14	89	89	0.09334427
14	90	90	0.09334427
14	91	91	0.09334427
14	92	92	0.09334427
14	93	93	0.09334427
14	94	94	0.09334427
14	95	95	0.09334427
14	96	96	0.09334427
14	97	97	0.09334427
14	98	98	0.09334427
14	99	99	0.09334427
14	100	100	0.09334427

TABLE 1

N	I	J	VALUE
14	6	7	0.07750373
	8	8	0.06759652
	9	9	0.05994191
7	7	7	0.087114093
	8	8	0.07612699
15	1	1	0.52095471
	2	2	0.20663407
	3	3	0.12715184
	4	4	0.09162042
	5	5	0.07156319
	6	6	0.05869594
	7	7	0.04974501
	8	8	0.04316028
	9	9	0.03811374
	10	10	0.03412311
	11	11	0.03088854
	12	12	0.02821384
	13	13	0.02596529
	14	14	0.02404858
	15	15	0.02239532
2	2	2	0.21854199
	3	3	0.13518661
	4	4	0.09769103
	5	5	0.07644392
	6	6	0.06277788
	7	7	0.05325335
	8	8	0.04623665
	9	9	0.04085300
	10	10	0.03659193
	11	11	0.03313559
	12	12	0.03027571
	13	13	0.02787020
	14	14	0.02581876
3	3	3	0.14434970
	4	4	0.10464296
	5	5	0.08204917
	6	6	0.06747552
	7	7	0.05729730
	8	8	0.04978712
	9	9	0.04401761
	10	10	0.03944651
	11	11	0.03573556
	12	12	0.03266286
	13	13	0.03007678
4	4	4	0.11268683
14	6	7	0.07750373
	8	8	0.06759652
	9	9	0.05994191
7	7	7	0.087114093
	8	8	0.07612699
15	1	1	0.52095471
	2	2	0.20663407
	3	3	0.12715184
	4	4	0.09162042
	5	5	0.07156319
	6	6	0.05869594
	7	7	0.04974501
	8	8	0.04316028
	9	9	0.03811374
	10	10	0.03412311
	11	11	0.03088854
	12	12	0.02821384
	13	13	0.02596529
	14	14	0.02404858
	15	15	0.02239532
2	2	2	0.21854199
	3	3	0.13518661
	4	4	0.09769103
	5	5	0.07644392
	6	6	0.06277788
	7	7	0.05325335
	8	8	0.04623665
	9	9	0.04085300
	10	10	0.03659193
	11	11	0.03313559
	12	12	0.03027571
	13	13	0.02787020
	14	14	0.02581876
3	3	3	0.14434970
	4	4	0.10464296
	5	5	0.08204917
	6	6	0.06747552
	7	7	0.05729730
	8	8	0.04978712
	9	9	0.04401761
	10	10	0.03944651
	11	11	0.03573556
	12	12	0.03266286
	13	13	0.03007678
4	4	4	0.11268683
15	4	5	0.08855522
	6	6	0.07294070
	7	7	0.06201033
	8	8	0.05393085
	9	9	0.04771525
	10	10	0.04278506
	11	11	0.03877880
	12	12	0.03545890
5	5	5	0.09620120
	6	6	0.07938005
	7	7	0.06757458
	8	8	0.05883077
	9	9	0.05209337
	10	10	0.04674233
	11	11	0.04238934
6	6	6	0.08708230
	7	7	0.07424521
	8	8	0.06471573
	9	9	0.05735953
	10	10	0.05150825
7	7	7	0.08239150
	8	8	0.07191771
	9	9	0.06381548
8	8	8	0.08093759
16	1	1	0.51960375
	2	2	0.20594361
	3	3	0.12668633
	4	4	0.09126889
	5	5	0.07128066
	6	6	0.05845971
	7	7	0.04954200
	8	8	0.04298230
	9	9	0.03795529
	10	10	0.03398031
	11	11	0.03075858
	12	12	0.02809460
	13	13	0.02585513
	14	14	0.02394622
	15	15	0.02229973
	16	16	0.02086504
2	2	2	0.21699115
	3	3	0.13413454
	4	4	0.09689349
	5	5	0.07580124
16	2	6	0.06223949
	7	7	0.05279003
	8	8	0.04582997
	9	9	0.04049060
	10	10	0.03626508
	11	11	0.03283793
	12	12	0.03000245
	13	13	0.02761764
	14	14	0.02558398
	15	15	0.02382924
3	3	3	0.14255110
	4	4	0.10327381
	5	5	0.08094269
	6	6	0.06654663
	7	7	0.05649663
	8	8	0.04908343
	9	9	0.04338988
	10	10	0.03879988
	11	11	0.03521917
	12	12	0.03218850
	13	13	0.02963811
	14	14	0.02746222
4	4	4	0.11057597
	5	5	0.08684393
	6	6	0.07150070
	7	7	0.06076687
	8	8	0.05283643
	9	9	0.04673781
	10	10	0.04190191
	11	11	0.03797327
	12	12	0.03471842
	13	13	0.03197768
5	5	5	0.09368911
	6	6	0.07726068
	7	7	0.06574073
	8	8	0.05721411
	9	9	0.05064759
	10	10	0.04543455
	11	11	0.04119538
	12	12	0.03768036
6	6	6	0.08404266
	7	7	0.07160902
	8	8	0.06238742
	9	9	0.05527411
	10	10	0.04961947
	11	11	0.04501605
7	7	7	0.07863887
16	7	8	0.06859624
	9	9	0.06083522
	10	10	0.05465622
8	8	8	0.07618816
	9	9	0.06764725
17	1	1	0.51841640
	2	2	0.20533756
	3	3	0.12627803
	4	4	0.09096069
	5	5	0.07103303
	6	6	0.05825270
	7	7	0.04935415
	8	8	0.04282639
	9	9	0.03781649
	10	10	0.03385524
	11	11	0.03064477
	12	12	0.02799018
	13	13	0.02575867
	14	14	0.02385659
	15	15	0.02221603
	16	16	0.02078653
	17	17	0.01952983
2	2	2	0.21564020
	3	3	0.13321911
	4	4	0.09620002
	5	5	0.07524270
	6	6	0.06177175
	7	7	0.05238762
	8	8	0.04547683
	9	9	0.04017595
	10	10	0.03598136
	11	11	0.03257958
	12	12	0.02976531
	13	13	0.02739847
	14	14	0.02538025
	15	15	0.02363893
	16	16	0.02212117
3	3	3	0.14100026
	4	4	0.10209447
	5	5	0.07999029
	6	6	0.06576271
	7	7	0.05580810
	8	8	0.04847849
	9	9	0.04285038
	10	10	0.03839301
	11	11	0.03477554

TABLE 1

N	I	J	VALUE
17	3	12	0.03178105
		13	0.02926137
		14	0.02711187
		15	0.02525657
	4	4	0.10877737
		5	0.08538722
		6	0.07027503
		7	0.05970976
		8	0.05190644
		9	0.04590753
		10	0.04115196
		11	0.03728943
		12	0.03408994
		13	0.03139623
		14	0.02909715
	5	5	0.09157825
		6	0.07548156
		7	0.06420247
		8	0.05585886
		9	0.04943619
		10	0.04433925
		11	0.04019577
		12	0.03676100
		13	0.03386734
	6	6	0.08153056
		7	0.06943255
		8	0.06046671
		9	0.05355494
		10	0.04806327
		11	0.04359444
		12	0.03988680
	7	7	0.07559923
		8	0.06590873
		9	0.05842595
		10	0.05247249
		11	0.04762235
	8	8	0.07243553
		9	0.06427703
		10	0.0577583
	9	9	0.07143874
	1	1	0.51736462
		2	0.20480137
		3	0.12591701
17	3	12	0.09068829
		5	0.07081421
		6	0.05806983
		7	0.04920705
		8	0.04268869
		9	0.03769393
		10	0.03374480
		11	0.03054427
		12	0.02789798
		13	0.02567351
		14	0.02377746
		15	0.02214213
		16	0.02071722
		17	0.01946457
		18	0.01835474
	2	2	0.21445285
		3	0.13241533
		4	0.09559152
		5	0.07475280
		6	0.06136163
		7	0.05203486
		8	0.04516733
		9	0.03990023
		10	0.03573276
		11	0.03235324
		12	0.02955756
		13	0.02720650
		14	0.02520182
		15	0.02347224
		16	0.02196479
		17	0.02063925
	3	3	0.13964932
		4	0.10106806
		5	0.07916190
		6	0.06505277
		7	0.05520971
		8	0.04795291
		9	0.04238175
		10	0.03797016
		11	0.03439032
		12	0.03142729
		13	0.02893431
		14	0.02680777
		15	0.02497239
		16	0.02337223
	4	4	0.10722654
		5	0.08413223
		6	0.06922124
18	4	7	0.05880006
		8	0.05110646
		9	0.04519355
		10	0.04050721
		11	0.03670164
		12	0.03354985
		13	0.03089665
		14	0.02863242
		15	0.02667743
	5	5	0.08977965
		6	0.07396688
		7	0.06289371
		8	0.05470640
		9	0.04840650
		10	0.04340857
		11	0.03934667
		12	0.03598027
		13	0.03314476
		14	0.03072372
	6	6	0.07941971
		7	0.06760526
		8	0.05885525
		9	0.05211338
		10	0.04675899
		11	0.04240344
		12	0.03879090
		13	0.03574605
	7	7	0.07308713
		8	0.06368963
		9	0.05643806
		10	0.05067182
		11	0.04597643
		12	0.04207862
	8	8	0.06939589
		9	0.06154978
		10	0.05530212
		11	0.05020878
	9	9	0.06788610
		10	0.06086797
	1	1	0.51642646
		2	0.20432361
		3	0.12559551
		4	0.09044579
		5	0.07061947
18	1	6	0.05790708
		7	0.04906727
		8	0.04256619
		9	0.03758489
		10	0.03364656
		11	0.03045487
		12	0.02781598
		13	0.02559776
		14	0.02370708
		15	0.02207641
		16	0.02065558
		17	0.01940653
		18	0.01829991
		19	0.01731266
	2	2	0.21340106
		3	0.13170396
		4	0.09505327
		5	0.07431962
		6	0.06099908
		7	0.05172309
		8	0.04489383
		9	0.03965662
		10	0.03551314
		11	0.03215330
		12	0.02937406
		13	0.02703694
		14	0.02504424
		15	0.02332503
		16	0.02182669
		17	0.02050920
		18	0.01934168
	3	3	0.13846195
		4	0.10016665
		5	0.07843480
		6	0.06444321
		7	0.05468486
		8	0.04749201
		9	0.04197088
		10	0.03759951
		11	0.03405269
		12	0.03111727
		13	0.02864773
		14	0.02654132
		15	0.02472343
		16	0.02313859
		17	0.02174469
	4	4	0.10587559
		5	0.08303981

TABLE 1

N	I	J	VALUE
19	4	6	0.06830376
	7	7	0.05800896
	8	8	0.05041100
	9	9	0.04457302
	10	10	0.03994700
	11	11	0.03619102
	12	12	0.03308072
	13	13	0.03046219
	14	14	0.02822886
	15	15	0.02630023
	16	16	0.02461831
5	5	5	0.08822881
	6	6	0.07266180
	7	7	0.06176668
	8	8	0.05371442
	9	9	0.04752051
	10	10	0.04260802
	11	11	0.03861649
	12	12	0.03530903
	13	13	0.03252365
	14	14	0.03014573
	15	15	0.02809194
6	6	6	0.07762111
	7	7	0.06604940
	8	8	0.05748396
	9	9	0.05088726
	10	10	0.04565009
	11	11	0.04139119
	12	12	0.03785974
	13	13	0.03488391
	14	14	0.03234209
7	7	7	0.07097628
	8	8	0.06182636
	9	9	0.05476996
	10	10	0.04916161
	11	11	0.04459663
	12	12	0.04080839
	13	13	0.03761402
8	8	8	0.06688379
	9	9	0.05929764
	10	10	0.05326074
	11	11	0.04834179
	12	12	0.04425617
9	9	9	0.06464646
	10	10	0.05810902
	11	11	0.05277590
19	10	10	0.06393346
20	1	1	0.5158445
	2	2	0.20389523
	3	3	0.12530739
	4	4	0.09022853
	5	5	0.07044503
	6	6	0.05776134
	7	7	0.04894210
	8	8	0.04245649
	9	9	0.03748725
	10	10	0.03355861
	11	11	0.03037485
	12	12	0.02774256
	13	13	0.02552995
	14	14	0.02364409
	15	15	0.02201759
	16	16	0.02060041
	17	17	0.01935459
	18	18	0.01825083
	19	19	0.01726615
	20	20	0.01638227
2	2	2	0.21246291
	3	3	0.13106994
	4	4	0.09457377
	5	5	0.07393386
	6	6	0.06067631
	7	7	0.05144557
	8	8	0.04465042
	9	9	0.03943983
	10	10	0.03531773
	11	11	0.03197540
	12	12	0.02921081
	13	13	0.02688609
	14	14	0.02490404
	15	15	0.02319410
	16	16	0.02170385
	17	17	0.02039351
	18	18	0.01923236
	19	19	0.01819631
3	3	3	0.13741018
	4	4	0.09936871
	5	5	0.07779147
	6	6	0.06390408
	7	7	0.05422076
	8	8	0.04708457
	9	9	0.04160773
	10	10	0.03727194
3	11	11	0.03375435
	12	12	0.03084335
	13	13	0.02839454
	14	14	0.02630592
	15	15	0.02450351
	16	16	0.02293222
	17	17	0.02155031
	18	18	0.02032547
4	4	4	0.10468823
	5	5	0.08208030
	6	6	0.06749828
	7	7	0.05731469
	8	8	0.04980086
	9	9	0.04402874
	10	10	0.03945572
	11	11	0.03574330
	12	12	0.03266946
	13	13	0.03008247
	14	14	0.02787516
	15	15	0.02596965
	16	16	0.02430802
	17	17	0.02284624
5	5	5	0.08687787
	6	6	0.07152565
	7	7	0.06078601
	8	8	0.05285159
	9	9	0.04675012
	10	10	0.04191212
	11	11	0.03798188
	12	12	0.03472577
	13	13	0.03198402
	14	14	0.02964365
	15	15	0.02762252
	16	16	0.02585947
6	6	6	0.07607027
	7	7	0.06470871
	8	8	0.05630291
	9	9	0.04983167
	10	10	0.04469576
	11	11	0.04052030
	12	12	0.03705882
	13	13	0.03414251
	14	14	0.03165196
	15	15	0.02950021
7	7	7	0.06917768
	8	8	0.06023975
	9	9	0.05335029
7	10	10	0.04787689
	11	11	0.04342330
	12	12	0.03972887
	13	13	0.03661385
	14	14	0.03399524
8	8	8	0.06477294
	9	9	0.05740650
	10	10	0.05154753
	11	11	0.04677570
	12	12	0.04281377
	13	13	0.03947147
9	9	9	0.06213437
	10	10	0.05583055
	11	11	0.05069093
	12	12	0.04641976
10	10	10	0.06089383
	11	11	0.05532422
21	1	1	0.51482455
	2	2	0.20350894
	3	3	0.12504768
	4	4	0.09003276
	5	5	0.07028788
	6	6	0.05763005
	7	7	0.04882935
	8	8	0.04235769
	9	9	0.03739934
	10	10	0.03347941
	11	11	0.03030279
	12	12	0.02767646
	13	13	0.02546890
	14	14	0.02358736
	15	15	0.02196462
	16	16	0.02055074
	17	17	0.01930782
	18	18	0.01820665
	19	19	0.01722428
	20	20	0.01634248
	21	21	0.01554655
2	2	2	0.21162090
	3	3	0.13050129
	4	4	0.09414391
	5	5	0.07358813
	6	6	0.06038709
	7	7	0.05119696
	8	8	0.04443238

TABLE 1

N	I	J	VALUE
21	2	9	0.03924567
		10	0.03514270
		11	0.03181610
		12	0.02905462
		13	0.02675103
		14	0.02477852
		15	0.02307687
		16	0.02159388
		17	0.02028995
		18	0.01913451
		19	0.01810355
		20	0.01717801
	3	3	0.13647202
		4	0.09865743
		5	0.07721824
		6	0.06342383
		7	0.05380747
		8	0.04672179
		9	0.04128443
		10	0.03698037
		11	0.03348881
		12	0.03059960
		13	0.02815922
		14	0.02609647
		15	0.02430782
		16	0.02274862
		17	0.02137737
		18	0.02016202
		19	0.01907744
	4	4	0.10363645
		5	0.08123084
		6	0.06678550
		7	0.05670053
		8	0.04926123
		9	0.04354748
		10	0.03902140
		11	0.03534755
		12	0.03230598
		13	0.02974638
		14	0.02756263
		15	0.02567758
		16	0.02403387
		17	0.02258796
		18	0.02130614
	5	5	0.08569051
		6	0.07052763
		7	0.05992492
		8	0.05209424
	9	9	0.04607411
		10	0.04130159
		11	0.03742525
		12	0.03421426
		13	0.03151087
		14	0.02920347
		15	0.02721102
		16	0.02547311
		17	0.02394392
	6	6	0.07471932
		7	0.06354146
		8	0.05527510
		9	0.04891338
		10	0.04386579
		11	0.03976309
		12	0.03636260
		13	0.03349814
		14	0.03105225
		15	0.02893936
		16	0.02709580
	7	7	0.06762684
		8	0.05887245
		9	0.05212742
		10	0.04677068
		11	0.04241333
		12	0.03879936
		13	0.03575341
		14	0.03315119
		15	0.03090234
	8	8	0.06297434
		9	0.05579603
		10	0.05008930
		11	0.04544324
		12	0.04158700
		13	0.03833475
		14	0.03555483
	9	9	0.06002351
		10	0.05391715
		11	0.04894094
		12	0.04480729
		13	0.04131864
	10	10	0.05838173
		11	0.05302424
		12	0.04856694
	11	11	0.05785419
	21	5	0.04607411
		10	0.04130159
		11	0.03742525
		12	0.03421426
		13	0.03151087
		14	0.02920347
		15	0.02721102
		16	0.02547311
		17	0.02394392
	22	1	0.51413529
		2	0.20315885
		3	0.12481242
		4	0.08985545
		5	0.07014555
		6	0.05751117
		7	0.04872727
		8	0.04225825
		9	0.03731974
		10	0.03340770
		11	0.03023756
		12	0.02761663
		13	0.02541364
		14	0.02353603
		15	0.02191669
		16	0.02050578
		17	0.01926550
		18	0.01816666
		19	0.01718635
		20	0.01630647
		21	0.01551226
		22	0.01479180
	2	2	0.21086100
		3	0.12998842
		4	0.09375639
		5	0.07327653
		6	0.06012647
		7	0.05097295
		8	0.04423594
		9	0.03907076
		10	0.03498507
		11	0.03167261
		12	0.02893296
		13	0.02662939
		14	0.02466549
		15	0.02297129
		16	0.02149484
		17	0.02019670
		18	0.01904639
		19	0.01802003
		20	0.01709864
		21	0.01626685
	3	3	0.13563002
		4	0.09801940
		5	0.07670425
		6	0.06299335
		7	0.05343707
		8	0.046639672
		9	0.04099479
	4	4	0.10269830
		5	0.08047353
		6	0.06615027
		7	0.05615335
		8	0.04878058
		9	0.04311889
		10	0.03863467
		11	0.03499521
		12	0.03198241
		13	0.02944722
		14	0.02728446
		15	0.02541763
		16	0.02378992
		17	0.02235813
		18	0.02108891
		19	0.01995607
	5	5	0.08463873
		6	0.06964400
		7	0.05916283
		8	0.05142415
		9	0.04547612
		10	0.04076166
		11	0.03693306
		12	0.03376204
		13	0.03109261
		14	0.02881438
		15	0.02684734
		16	0.02513167
		17	0.02362218
		18	0.02228376
	6	6	0.07353197
		7	0.06251605
		8	0.05437253
		9	0.04810723
		10	0.04313736
		11	0.03909867
		12	0.03575183

TABLE 1

N	I	J	VALUE
22	6	13	0.03293294
	14	0.03052636	
	15	0.02844755	
	16	0.02663401	
	17	0.02503782	
	7	7	0.06627589
		8	0.05768196
		9	0.05106310
		10	0.04580822
		11	0.04153485
		12	0.03799132
		13	0.03500535
		14	0.03245470
		15	0.03025083
		16	0.02832727
	8	8	0.06142350
		9	0.05440810
		10	0.04883310
		11	0.04429578
		12	0.04053088
		13	0.03735642
		14	0.03464364
		15	0.03229862
	9	9	0.05822491
		10	0.05228766
		11	0.04745127
		12	0.04343519
		13	0.04004683
		14	0.03714946
	10	10	0.05627087
		11	0.05109269
		12	0.04678920
		13	0.04315569
	11	11	0.05534209
		12	0.05070639
	23	1	0.51350726
		2	0.20284008
		3	0.12459827
		4	0.08969409
		5	0.07001607
		6	0.05740303
		7	0.04863442
		8	0.04218690
		9	0.03724735
	2	2	0.21017174
		3	0.12952350
		4	0.09340518
		5	0.07299422
		6	0.05989039
		7	0.05077006
		8	0.04405805
		9	0.03891237
		10	0.03484232
		11	0.03154270
		12	0.02881376
		13	0.02651927
		14	0.02456316
		15	0.02287573
		16	0.02140520
		17	0.02011228
		18	0.01896663
		19	0.01794445
		20	0.01702680
		21	0.01619842
		22	0.01544692
	3	3	0.13487011
		4	0.09744386
		5	0.07624076
		6	0.06260526
		7	0.05310322
		8	0.04610376
		9	0.04073378
		10	0.03648382
		11	0.03303668
		12	0.03018455
		13	0.02778567
		14	0.02573994
		15	0.02397477
		16	0.02243612
	1	10	0.03334250
		11	0.03017823
		12	0.02756222
		13	0.02536338
		14	0.02348934
		15	0.02187309
		16	0.02046490
		17	0.01922701
		18	0.01813030
		19	0.01715193
		20	0.01627373
		21	0.01548107
		22	0.01476202
		23	0.01410680
	2	2	0.21017174
		3	0.12952350
		4	0.09340518
		5	0.07299422
		6	0.05989039
		7	0.05077006
		8	0.04405805
		9	0.03891237
		10	0.03484232
		11	0.03154270
		12	0.02881376
		13	0.02651927
		14	0.02456316
		15	0.02287573
		16	0.02140520
		17	0.02011228
		18	0.01896663
		19	0.01794445
		20	0.01702680
		21	0.01619842
		22	0.01544692
	3	3	0.13487011
		4	0.09744386
		5	0.07624076
		6	0.06260526
		7	0.05310322
		8	0.04610376
		9	0.04073378
		10	0.03648382
		11	0.03303668
		12	0.03018455
		13	0.02778567
		14	0.02573994
		15	0.02397477
		16	0.02243612
	3	17	0.02108304
		18	0.01988387
		19	0.01881376
		20	0.01785292
		21	0.01698547
	4	4	0.10185629
		5	0.07979415
		6	0.06558061
		7	0.05566277
		8	0.04834975
		9	0.04273479
		10	0.03828812
		11	0.03467952
		12	0.03169252
		13	0.02917922
		14	0.02703530
		15	0.02518477
		16	0.02357142
		17	0.02215229
		18	0.02089436
		19	0.01977158
		20	0.01876333
	5	5	0.08370057
		6	0.06885616
		7	0.05848359
		8	0.05082708
		9	0.04494341
		10	0.04028075
		11	0.03649475
		12	0.03335936
		13	0.03072023
		14	0.02846796
		15	0.02652364
		16	0.02482775
		17	0.02333585
		18	0.02201305
		19	0.02083224
	6	6	0.07248019
		7	0.06160811
		8	0.05357363
		9	0.04739388
		10	0.04249295
		11	0.03851099
		12	0.03521167
		13	0.03243317
		14	0.03006140
		15	0.02801270
		16	0.02622580
	6	17	0.02465302
		18	0.02325839
		19	0.02198122
		20	0.02083224
	7	7	0.06508853
		8	0.05663607
		9	0.05012839
		10	0.04434668
		11	0.03961215
		12	0.03565055
		13	0.03285134
		14	0.030155684
		15	0.027955424
	8	8	0.06007256
		9	0.05319959
		10	0.04773968
		11	0.04329733
		12	0.03961215
		13	0.03650555
		14	0.03385134
		15	0.03155684
		16	0.02955424
	8	8	0.06007256
		9	0.05319959
		10	0.04773968
		11	0.04329733
		12	0.03961215
		13	0.03650555
		14	0.03385134
		15	0.03155684
		16	0.02955424
	9	9	0.05667407
		10	0.05088326
		11	0.04616788
		12	0.04225349
		13	0.03895182
		14	0.03612919
		15	0.03368863
	10	10	0.05447227
		11	0.04944766
		12	0.04527339
		13	0.04175017
		14	0.03873656
	11	11	0.05323123
		12	0.04875974
		13	0.04498287
	12	12	0.05283000
	1	1	0.51293266
		2	0.20254862
		3	0.12440255
		4	0.08954664
		5	0.06989776

TABLE 1

N	I	J	VALUE
24	1	6	0.05730423
		7	0.04854959
		8	0.04211258
		9	0.03718123
		10	0.03328293
		11	0.03012405
		12	0.02751251
		13	0.02531748
		14	0.02344670
		15	0.02183329
		16	0.02042755
		17	0.01919185
		18	0.01809710
		19	0.01712047
		20	0.01624383
		21	0.01545258
		22	0.01473483
		23	0.01408079
		24	0.01348232
2	2	2	0.20954371
		3	0.12910011
		4	0.09308546
		5	0.07273726
		6	0.05967555
		7	0.05058545
		8	0.04389621
		9	0.03876881
		10	0.03471247
		11	0.03142453
		12	0.02870533
		13	0.02641910
		14	0.02447008
		15	0.02278881
		16	0.02132367
		17	0.02003551
		18	0.01889410
		19	0.01787570
		20	0.01696146
		21	0.01613618
		22	0.01538747
		23	0.01470512
3	3	3	0.13418085
		4	0.09692208
		5	0.07582069
		6	0.06225360
		7	0.05280075
		8	0.04583839
		9	0.04049738
		10	0.03627068
24	3	11	0.03284262
		12	0.03000644
		13	0.02762108
		14	0.02558696
		15	0.033283188
		16	0.02330203
		17	0.02095678
		18	0.01976454
		19	0.01870065
		20	0.01774543
		21	0.01688305
		22	0.01610060
4	4	4	0.10109638
		5	0.07918127
		6	0.06506687
		7	0.05522045
		8	0.04796135
		9	0.04238857
		10	0.03797581
		11	0.03439505
		12	0.03143133
		13	0.02893776
		14	0.02681082
		15	0.02497499
		16	0.02337468
		17	0.02196688
		18	0.02071913
		19	0.01960547
		20	0.01860541
		21	0.01770248
5	5	5	0.08285857
		6	0.06814936
		7	0.05787439
		8	0.05029169
		9	0.04446585
		10	0.03984968
		11	0.03610192
		12	0.03299849
		13	0.03038654
		14	0.02815763
		15	0.02623369
		16	0.02455533
		17	0.02307940
		18	0.02177052
		19	0.02060231
		20	0.01955288
6	6	6	0.07154203
		7	0.06079856
24	6	8	0.05286152
		9	0.04675818
		10	0.04191880
		11	0.03798749
		12	0.03473060
		13	0.03198808
		14	0.02964739
		15	0.02762547
		16	0.02586260
		17	0.02431037
		18	0.02293465
		19	0.02170593
7	7	7	0.06403676
		8	0.05570996
		9	0.04930098
		10	0.04421540
		11	0.04008152
		12	0.03665491
		13	0.03376846
		14	0.03130330
		15	0.02917439
		16	0.02731547
		17	0.02568069
		18	0.02422966
8	8	8	0.05888519
		9	0.05213782
		10	0.04677933
		11	0.04242063
		12	0.03880565
		13	0.03575876
		14	0.03315608
		15	0.03090623
		16	0.02894361
		17	0.02721426
9	9	9	0.05532312
		10	0.04966036
		11	0.04505072
		12	0.04122514
		13	0.03799916
		14	0.03524172
		15	0.03285817
		16	0.03077584
10	10	10	0.05292144
		11	0.04802983
		12	0.04396741
		13	0.04053958
		14	0.03760833
24	10	15	0.03507265
		11	0.05143263
		12	0.04710178
		13	0.04344501
		14	0.04031607
		12	0.05071914
		13	0.04680034
25	1	1	0.51240495
		2	0.20228110
		3	0.12422295
		4	0.08941137
		5	0.06978923
		6	0.05721360
		7	0.04847180
		8	0.04204442
		9	0.03712058
		10	0.03322831
		11	0.03007436
		12	0.02746695
		13	0.02527539
		14	0.02340760
		15	0.02179678
		16	0.02039332
		17	0.01915962
		18	0.01806664
		19	0.01709161
		20	0.01621641
		21	0.01542647
		22	0.01470990
		23	0.01405694
		24	0.01345947
		25	0.01291072
2	2	2	0.20896911
		3	0.12871291
		4	0.09279317
		5	0.07250240
		6	0.05947921
		7	0.05041676
		8	0.04374833
		9	0.03863663
		10	0.03459384
		11	0.03131657
		12	0.02860629
		13	0.02632760
		14	0.02438506
		15	0.02270941

TABLE 1

N	I	J	VALUE
25	2	16	0.02124920
		17	0.01996538
		18	0.01882785
		19	0.01781291
		20	0.01690178
		21	0.01607931
		22	0.01533317
		23	0.01465314
		24	0.01403091
	3	3	0.13355283
		4	0.09644684
		5	0.07543821
		6	0.06193348
		7	0.05252545
		8	0.04559688
		9	0.04028227
		10	0.03607674
		11	0.03266606
		12	0.02984439
		13	0.02747135
		14	0.02544778
		15	0.02370190
		16	0.02218007
		17	0.02084197
		18	0.01965600
		19	0.01859781
		20	0.01764769
		21	0.01679000
		22	0.01601167
		23	0.01530246
	4	4	0.10040712
		5	0.07862557
		6	0.06460118
		7	0.05481959
		8	0.04760944
		9	0.04207491
		10	0.03769289
		11	0.03413737
		12	0.03119477
		13	0.02871907
		14	0.02660751
		15	0.02478502
		16	0.02319650
		17	0.02179887
		18	0.02056053
		19	0.01945499
		20	0.01848244
		21	0.01756600
		22	0.01675307
	5	5	0.08209866
		6	0.06751169
		7	0.05732493
		8	0.04980892
		9	0.04403528
		10	0.03946111
		11	0.03574786
		12	0.03267328
		13	0.03008589
		14	0.02787799
		15	0.02597234
		16	0.02430990
		17	0.02284842
		18	0.02155191
		19	0.02039534
		20	0.01935612
		21	0.01841792
	6	6	0.07070003
		7	0.06007223
		8	0.05222279
		9	0.04618812
		10	0.04140402
		11	0.03751818
		12	0.03429938
		13	0.03158911
		14	0.02927641
		15	0.02727848
		16	0.02553754
		17	0.02400330
		18	0.02264491
		19	0.02143061
		20	0.02034056
	7	7	0.06309859
		8	0.05488417
		9	0.04856340
		10	0.04354893
		11	0.03947361
		12	0.03609605
		13	0.03325137
		14	0.03082194
		15	0.02872440
		16	0.02689194
		17	0.02528217
		18	0.02385170
		19	0.02257698
	8	8	0.05783342
		9	0.05119761
		10	0.04592918
	8	11	0.04164471
		12	0.03716280
		13	0.03446272
		14	0.03212927
		15	0.03008991
		16	0.02829789
	10	10	0.05157049
		11	0.04679517
		12	0.04283051
		13	0.03948599
		14	0.03662669
		15	0.03415355
		16	0.03199507
	11	11	0.04988180
		12	0.04567276
		13	0.04211994
		14	0.03908077
		15	0.03645141
	12	12	0.04892054
		13	0.04513147
		14	0.04188829
	13	13	0.04860828
		14	0.04513147
		15	0.04188829
		16	0.03863066
		17	0.03574786
		18	0.03267328
		19	0.03008589
		20	0.02787799
		21	0.02597234
		22	0.02430990
		23	0.02284842
		24	0.02155191
		25	0.02039534

Table with multiple columns containing numerical data, likely representing a dataset or a series of calculations. The table is organized into several sections, each with a header row and multiple data rows. The data is presented in a structured, grid-like format.

T A B L E 3

VARIANCES, COVARIANCES AND PERCENTAGE EFFICIENCIES OF THE BEST LINEAR UNBIASED ESTIMATES OF THE MEAN AND STANDARD DEVIATION FOR CENSORED SAMPLES UP TO SIZE TWENTY-FIVE FROM A LOGISTIC DISTRIBUTION

N	R1	R2	VAR MU	VAR	RE MU	RE	COV MU	SIGMA	SIGMA	SIGMA	N	R1	R2	VAR MU	VAR	RE MU	RE	COV MU	SIGMA	SIGMA	SIGMA	N	R1	R2	VAR MU	VAR	RE MU	RE	COV MU	SIGMA	SIGMA	SIGMA					
2	0	0	0.5000	0.6449	100.00	100.00	0.				1	0	0	0.1359	0.1381	99.16	82.93	-0.0052				1	2	0	0.1067	0.1403	97.55	61.47	0.0070								
3	0	0	0.3260	0.3333	100.00	100.00	0.				2	0	0	0.1428	0.1789	94.40	64.00	-0.0219				2	1	3	0	0.1132	0.1821	91.92	47.37	0.0235							
1	0	0	0.3921	0.7198	83.15	46.31	-0.1598				3	0	0	0.1685	0.2520	79.97	45.45	-0.0653				3	0	1	4	0	0.1327	0.2549	78.45	33.84	0.0612						
4	0	0	0.2410	0.2254	100.00	100.00	0.				4	0	0	0.2637	0.4032	51.11	28.40	-0.1853				4	0	1	5	0	0.1938	0.4047	53.71	21.32	0.1569						
1	0	0	0.4313	0.7772	55.88	29.00	-0.3161				5	0	0	0.7528	0.8650	17.90	13.24	-0.6605				5	0	1	6	0	0.4601	0.8621	22.62	10.01	0.5059						
1	0	0	0.5232	0.8165	36.50	20.87	-0.4497				0	1	0	0.1359	0.1381	99.16	82.93	0.0052				0	2	2	0	0.1080	0.1798	96.43	47.99	0.							
1	0	0	0.1960	0.2320	97.45	73.43	-0.0176				1	1	0	0.1367	0.1733	98.60	66.08	0.				1	2	3	0	0.1135	0.2502	91.75	34.48	0.0197							
2	0	0	0.2363	0.3727	80.81	45.71	-0.0929				2	1	2	0.1428	0.2403	94.37	47.65	0.0203				2	3	4	0	0.1339	0.3971	77.72	21.73	0.0745							
3	0	0	0.2323	0.8165	36.50	20.87	-0.4497				3	1	3	0.1712	0.3834	78.73	29.87	0.0840				3	4	5	0	0.2289	0.8490	45.47	10.16	0.2817							
1	0	0	0.1960	0.2320	97.45	73.43	-0.0176				4	1	4	0.3225	0.8277	41.80	13.84	0.3432				4	5	6	0	0.1161	0.3949	89.63	21.85	0.							
1	1	0	0.1984	0.3565	96.23	47.79	0.				2	2	3	0.1458	0.3782	92.45	30.28	0.				2	4	6	0	0.1345	0.8439	77.37	10.22	0.0909							
1	2	0	0.2401	0.7741	79.54	22.01	-0.1319				2	3	0	0.1725	0.8150	78.12	14.05	0.1081				3	6	10	0	0.0935	0.0768	100.00	100.00	0.							
2	0	0	0.1581	0.1370	100.00	100.00	0.				3	0	0	0.1175	0.0984	100.00	100.00	0.				3	1	0	0	0.0937	0.0861	99.72	89.17	-0.0016							
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				1	0	0	0.1181	0.1149	99.45	85.62	-0.0033				1	0	0	0.0950	0.1000	98.34	76.80	-0.0058								
2	0	0	0.2751	0.2424	90.26	56.51	-0.0410				2	0	0	0.1218	0.1417	96.48	69.46	-0.0131				2	0	0	0.0989	0.1200	94.46	63.97	-0.0147								
3	0	0	0.2432	0.3898	64.99	35.14	-0.1412				3	0	0	0.1339	0.1850	87.71	53.21	-0.0361				3	0	0	0.1086	0.1495	86.03	51.35	-0.0316								
4	0	0	0.6347	0.8444	24.90	16.22	-0.5631				4	0	0	0.1707	0.2601	68.83	37.83	-0.0886				4	0	0	0.1317	0.1952	70.96	39.34	-0.0640								
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				5	0	0	0.2916	0.4140	40.28	23.77	-0.2251				5	0	0	0.1893	0.2728	49.36	28.15	-0.1309								
1	1	0	0.1616	0.2334	97.79	58.69	0.				6	0	0	0.8716	0.8809	13.48	11.17	-0.7455				6	0	0	0.3579	0.4297	26.11	17.87	-0.2936								
1	2	0	0.1751	0.3701	90.24	37.01	0.0430				0	1	0	0.1181	0.1149	99.45	85.62	0.0033				8	0	0	0.1025	0.9037	8.48	8.50	-0.8877								
1	3	0	0.2692	0.8039	58.71	17.04	0.2450				1	1	0	0.1186	0.1379	99.05	71.38	0.				0	1	0	0.0937	0.0861	99.72	89.17	0.0016								
2	2	0	0.1795	0.7941	88.05	17.25	0.				1	2	0	0.1219	0.1773	96.41	55.50	0.0113				1	1	0	0.0939	0.0980	99.51	78.38	0.								
6	0	0	0.1581	0.1370	100.00	100.00	0.				1	3	0	0.1343	0.2479	87.46	39.69	0.0410				1	2	0	0.0951	0.1161	98.25	66.14	0.0047								
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				1	4	0	0.1789	0.3950	65.67	24.92	0.1220				1	3	0	0.0989	0.1436	94.46	53.49	0.0149								
2	0	0	0.2751	0.2424	90.26	56.51	-0.0410				5	0	0	0.3881	0.8467	30.27	11.62	0.4294				1	4	0	0.1091	0.1868	85.64	41.11	0.0359								
3	0	0	0.2432	0.3898	64.99	35.14	-0.1412				2	0	0	0.4462	0.4462	25.37	0.0390					1	5	0	0.1357	0.2611	68.84	29.41	0.0804								
4	0	0	0.6347	0.8444	24.90	16.22	-0.5631				2	1	0	0.1343	0.3879	87.44	25.37	0.0390				1	6	0	0.2133	0.4130	43.81	18.60	0.1889								
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				2	2	0	0.1930	0.8334	60.86	11.81	0.2006				1	7	0	0.5351	0.8748	17.46	8.78	0.5744								
1	1	0	0.1616	0.2334	97.79	58.69	0.				3	3	0	0.1378	0.8297	85.26	11.86	0.				2	2	0	0.0960	0.1418	97.39	54.14	0.								
1	2	0	0.1751	0.3701	90.24	37.01	0.0430				9	0	0	0.1041	0.0863	100.00	100.00	0.				2	3	0	0.0992	0.1834	94.20	41.88	0.0116								
1	3	0	0.2692	0.8039	58.71	17.04	0.2450				2	0	0	0.1066	0.1172	97.64	79.58	-0.0085				2	4	0	0.1092	0.2559	85.56	30.01	0.0386								
2	2	0	0.1795	0.7941	88.05	17.25	0.				3	0	0	0.1132	0.1457	91.96	59.21	-0.0222				2	5	0	0.1407	0.4052	66.41	18.95	0.1072								
6	0	0	0.1581	0.1370	100.00	100.00	0.				4	0	0	0.1309	0.1904	79.55	45.31	-0.0503				3	5	0	0.1494	0.8565	62.54	8.97	0.1698								
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				5	0	0	0.1783	0.2670	58.40	32.31	-0.1105				4	4	0	0.1120	0.8548	83.44	8.98	0.								
2	0	0	0.2751	0.2424	90.26	56.51	-0.0410				6	0	0	0.3237	0.4226	32.16	20.41	-0.2610				5	0	0	0.1783	0.2670	58.40	32.31	-0.1105								
3	0	0	0.2432	0.3898	64.99	35.14	-0.1412				7	0	0	0.9886	0.8935	10.53	9.65	-0.8206				0	1	0	0.1045	0.0984	99.62	87.63	0.0022								
4	0	0	0.6347	0.8444	24.90	16.22	-0.5631				1	1	0	0.1048	0.1145	99.33	75.33	0.				1	1	0	0.0850	0.0766	99.79	90.38	-0.0011								
1	0	0	0.1603	0.1731	98.61	79.13	-0.0090				9	0	0	0.1041	0.0863	100.00	100.00	0.				2	2	0	0.0848	0.0692	100.00	100.00	0.								
1	1	0	0.1616	0.2334	97.79	58.69	0.				2	0	0	0.1066	0.1172	97.64	79.58	-0.0085				3	3	0	0.1011	0.2543	92.43	30.20	0.								

N R1 R2 VARMU VAR RE MU RE COV MU SIGMA SIGMA SIGMA

1 9 0.1722 0.2792 38.52 19.11 0.1465
1 10 0.3116 0.4357 21.28 12.25 0.2942
1 11 0.8369 0.9087 7.92 5.87 0.7927
2 2 0.0670 0.0768 99.04 69.46 0.
2 3 0.0677 0.0877 98.01 60.84 0.0028
2 4 0.0693 0.1025 95.68 52.08 0.0077
2 5 0.0727 0.1229 91.17 43.41 0.0161
2 6 0.0797 0.1524 83.24 35.02 0.0304
2 7 0.0938 0.1975 70.67 27.01 0.0556
2 8 0.1247 0.2740 53.18 19.47 0.1042
2 9 0.2028 0.4290 32.69 12.44 0.2143
2 10 0.4893 0.8985 13.55 5.94 0.5810
3 3 0.0682 0.1019 97.23 52.38 0.
3 4 0.0696 0.1218 95.27 43.82 0.0053
3 5 0.0728 0.1507 91.10 35.41 0.0149
3 6 0.0798 0.1952 83.12 27.33 0.0325
3 7 0.0956 0.2711 69.33 19.68 0.0672
3 8 0.1366 0.4252 48.54 12.55 0.1467
3 9 0.2870 0.8930 23.10 5.98 0.4119
4 4 0.0706 0.1501 93.95 35.54 0.
4 5 0.0732 0.1942 90.61 27.47 0.0107
4 6 0.0798 0.2696 83.12 19.79 0.0330
4 7 0.0979 0.4231 67.73 12.61 0.0858
4 8 0.1667 0.8899 39.77 6.00 0.2650
5 5 0.0747 0.2691 88.75 19.83 0.
5 6 0.0799 0.4222 82.96 12.64 0.0282
5 7 0.1021 0.8883 64.95 6.01 0.1299
6 6 0.0816 0.8877 81.22 6.01 0.

15 0 0 0.0618 0.0496 100.00 100.00 0.
1 0 0.0619 0.0531 99.92 93.43 -0.0004
1 0 0.0621 0.0577 99.55 85.90 -0.0115
2 0 0.0627 0.0637 98.59 77.83 -0.0034
4 0 0.0640 0.0713 96.64 69.52 -0.0065
5 0 0.0664 0.0810 93.16 61.19 -0.0113
6 0 0.0707 0.0935 87.49 53.02 -0.0186
7 0 0.0782 0.1099 79.02 45.10 -0.0298
8 0 0.0917 0.1322 67.43 37.50 -0.0471
9 0 0.1162 0.1637 53.18 30.28 -0.0749
10 0 0.1639 0.2114 37.72 23.45 -0.1226
11 0 0.2666 0.2914 23.19 17.01 -0.2132
12 0 0.5350 0.4520 11.55 10.97 -0.4208
13 0 1.6177 0.9349 3.82 5.30 -1.1439

N R1 R2 VARMU VAR RE MU RE COV MU SIGMA SIGMA SIGMA

3 9 0.1061 0.2776 54.58 16.67 0.0952
3 10 0.1651 0.4335 35.06 10.68 0.1911
3 11 0.3733 0.9054 15.50 5.11 0.5047
4 4 0.0603 0.1041 95.94 44.46 0.
4 5 0.0617 0.1246 93.86 37.16 0.0052
4 6 0.0645 0.1540 89.77 30.05 0.0143
4 7 0.0704 0.1992 82.28 23.24 0.0306
4 8 0.0832 0.2759 69.62 16.78 0.0619
4 9 0.1150 0.4313 50.33 10.73 0.1323
4 10 0.2285 0.9023 25.34 5.13 0.3635
5 5 0.0626 0.1537 92.46 30.12 0.
5 6 0.0649 0.1986 89.21 23.31 0.0101
5 7 0.0704 0.2749 82.28 16.84 0.0305
5 8 0.0848 0.4300 68.27 10.76 0.0779
5 9 0.1379 0.9005 41.97 5.14 0.2360
6 6 0.0662 0.2744 87.40 16.86 0.
6 7 0.0705 0.4294 82.11 10.78 0.0257
6 8 0.0879 0.8995 65.84 5.15 0.1162
7 7 0.0719 0.8992 80.50 5.15 0.

17 0 0 0.0544 0.0434 100.00 100.00 0.
1 0 0.0545 0.0460 99.94 94.35 -0.0003
2 0 0.0546 0.0494 99.69 87.89 -0.0010
3 0 0.0550 0.0536 99.06 80.93 -0.0022
4 0 0.0557 0.0589 97.80 73.71 -0.0041
5 0 0.0570 0.0654 95.57 66.39 -0.0070
6 0 0.0592 0.0734 91.98 59.12 -0.0112
7 0 0.0629 0.0835 86.57 51.98 -0.0173
8 0 0.0690 0.0964 78.93 45.06 -0.0262
9 0 0.0704 0.1131 68.98 38.39 -0.0392
10 0 0.0960 0.1357 56.68 37.00 -0.0586
11 0 0.1260 0.1675 43.21 25.92 -0.0896
12 0 0.1823 0.2156 29.87 20.14 -0.1416
13 0 0.3005 0.2960 18.11 14.67 -0.2392
14 0 0.6031 0.4574 9.03 9.49 -0.4602
15 0 1.8001 0.9424 3.02 4.61 -1.2221
0 1 0.0745 0.0460 99.94 94.35 0.0003
1 1 0.0548 0.0489 99.90 87.71 0.
1 2 0.0546 0.0528 99.66 82.27 0.0007
1 3 0.0550 0.0576 99.05 75.33 0.0020
1 4 0.0557 0.0637 97.80 68.13 0.0041
1 5 0.0570 0.0714 95.56 60.84 0.0072
1 6 0.0592 0.0810 91.90 53.61 0.0119

N R1 R2 VARMU VAR RE MU RE COV MU SIGMA SIGMA SIGMA

0 1 0.0619 0.0531 99.92 93.43 0.0004
1 1 0.0619 0.0571 99.85 86.88 0.
1 2 0.0621 0.0625 99.50 79.37 0.0011
1 3 0.0627 0.0695 98.58 71.33 0.0031
1 4 0.0640 0.0786 96.64 63.06 0.0065
1 5 0.0664 0.0905 93.11 54.80 0.0119
1 6 0.0709 0.1062 87.23 46.69 0.0202
1 7 0.0790 0.1276 78.25 38.86 0.0334
1 8 0.0940 0.1581 65.76 31.36 0.0548
1 9 0.1230 0.2044 50.25 24.25 0.0915
1 10 0.1843 0.2824 33.54 17.55 0.1606
1 11 0.3380 0.4397 18.29 11.27 0.3161
1 12 0.9097 0.9145 6.79 5.42 0.8371
2 2 0.0623 0.0689 99.21 71.90 0.
2 3 0.0628 0.0775 98.39 63.94 0.0021
2 4 0.0640 0.0889 96.57 55.77 0.0058
2 5 0.0664 0.1041 93.11 47.63 0.0118
2 6 0.0710 0.1249 87.12 39.68 0.0216
2 7 0.0797 0.1548 77.60 32.03 0.0377
2 8 0.0967 0.2004 63.90 24.74 0.0656
2 9 0.1329 0.2774 46.51 17.87 0.1184
2 10 0.2225 0.4333 27.78 11.44 0.2365
2 11 0.5457 0.9049 11.33 5.48 0.6270
3 3 0.0632 0.0884 97.74 56.08 0.
3 4 0.0643 0.1031 96.19 48.08 0.0039
3 5 0.0665 0.1268 93.01 40.13 0.0106
3 6 0.0710 0.1529 87.11 32.42 0.0221
3 7 0.0802 0.1980 77.08 25.03 0.0425
3 8 0.1002 0.2745 61.69 18.06 0.0816
3 9 0.1502 0.4296 41.16 11.54 0.1697
3 10 0.3297 0.8995 18.75 5.51 0.4601
4 4 0.0650 0.1231 95.07 40.28 0.
4 5 0.0668 0.1521 92.47 32.60 0.0073
4 6 0.0710 0.1968 87.07 25.13 0.0209
4 7 0.0806 0.2728 76.71 18.17 0.0479
4 8 0.1054 0.4274 58.63 11.60 0.1099
4 9 0.1962 0.8964 31.50 5.53 0.3162
5 5 0.0680 0.1964 90.85 25.24 0.
5 6 0.0713 0.2721 86.65 18.22 0.0158
5 7 0.0808 0.4263 76.47 11.63 0.0541
5 8 0.1176 0.8947 52.56 5.54 0.1853
6 6 0.0730 0.4259 84.72 11.64 0.
6 7 0.0809 0.8939 76.37 5.55 0.0611

16 0 0 0.0579 * 0.0463 *100.00 *100.00 * 0. *

N R1 R2 VARMU VAR RE MU RE COV MU SIGMA SIGMA SIGMA

1 0 0.0579 0.0493 99.93 93.93 -0.0003
2 0 0.0581 0.0532 99.63 86.97 -0.0012
3 0 0.0586 0.0582 98.86 79.49 -0.0027
4 0 0.0595 0.0645 97.30 71.75 -0.0051
5 0 0.0612 0.0724 94.54 63.96 -0.0088
6 0 0.0643 0.0823 90.06 56.25 -0.0143
7 0 0.0695 0.0950 83.33 48.74 -0.0224
8 0 0.0783 0.1116 73.92 41.49 -0.0345
9 0 0.0936 0.1340 61.88 34.54 -0.0530
10 0 0.1209 0.1657 47.90 27.94 -0.0824
11 0 0.1729 0.2136 33.48 21.67 -0.1324
12 0 0.2835 0.2938 20.42 15.75 -0.2266
13 0 0.5693 0.4549 10.17 10.18 -0.4411
14 0 1.7104 0.9389 3.38 4.93 -1.1843
0 1 0.0579 0.0493 99.93 93.93 0.0003
1 1 0.0580 0.0527 99.88 87.86 0.
1 2 0.0581 0.0572 99.59 80.92 0.0009
1 3 0.0586 0.0630 98.84 73.46 0.0025
1 4 0.0595 0.0704 97.30 65.76 0.0051
1 5 0.0613 0.0798 94.52 58.01 0.0091
1 6 0.0644 0.0919 89.92 50.36 0.0153
1 7 0.0699 0.1079 82.86 42.91 0.0247
1 8 0.0795 0.1295 72.85 35.74 0.0391
1 9 0.0967 0.1603 59.87 28.88 0.0621
1 10 0.1293 0.2069 44.78 22.37 0.1011
1 11 0.1970 0.2853 29.39 16.23 0.1739
1 12 0.3646 0.4432 15.88 10.44 0.3366
1 13 0.9811 0.9196 5.90 5.03 0.8785
2 2 0.0583 0.0625 99.35 74.01 0.
2 3 0.0587 0.0695 98.68 66.61 0.0017
2 4 0.0595 0.0785 97.23 58.99 0.0045
2 5 0.0613 0.0902 94.51 51.34 0.0089
2 6 0.0644 0.1057 89.88 43.80 0.0159
2 7 0.0701 0.1268 82.53 36.49 0.0270
2 8 0.0806 0.1570 71.79 29.48 0.0448
2 9 0.1006 0.2030 57.53 22.80 0.0751
2 10 0.1421 0.2805 40.75 16.50 0.1317
2 11 0.2429 0.4371 23.84 10.59 0.2574
2 12 0.6021 0.9105 9.62 5.08 0.6697
3 3 0.0590 0.0781 98.14 59.30 0.
3 4 0.0598 0.0894 96.88 51.80 0.0029
3 5 0.0613 0.1045 94.38 44.30 0.0078
3 6 0.0644 0.1253 89.87 36.95 0.0158
3 7 0.0703 0.1551 82.35 29.85 0.0291
3 8 0.0818 0.2006 70.74 23.08 0.0520

N R1 R2 VARMU VAR RE MU RE COV MU SIGMA SIGMA SIGMA

6 7 0.0636 0.2772 85.55 15.67 0.0147
6 8 0.0714 0.4328 76.26 10.03 0.0494
6 9 0.1005 0.9066 54.19 4.80 0.1665
7 7 0.0650 0.4326 83.73 10.04 0.0550
7 8 0.0714 0.9041 76.21 4.80 0.0550

18 0 0 0.0514 0.0409 100.00 100.00 0.
1 0 0.0514 0.0432 99.95 94.73 -0.0002
2 0 0.0515 0.0461 99.74 88.70 -0.0008
3 0 0.0518 0.0497 99.22 82.20 -0.0018
4 0 0.0523 0.0542 98.18 75.43 -0.0034
5 0 0.0533 0.0596 96.36 68.54 -0.0057
6 0 0.0550 0.0663 93.44 61.67 -0.0090
7 0 0.0577 0.0745 89.04 54.89 -0.0137
8 0 0.0620 0.0847 82.80 48.27 -0.0204
9 0 0.0690 0.0976 74.45 41.87 -0.0299
10 0 0.0800 0.1145 64.00 35.71 -0.0437
11 0 0.0900 0.1372 51.89 29.80 -0.0643
12 0 0.1315 0.1691 39.07 24.17 -0.0965
13 0 0.1919 0.2173 26.77 18.81 -0.1505
14 0 0.3175 0.2980 16.18 13.72 -0.2511
15 0 0.6362 0.4597 8.08 8.89 -0.4781
16 0 1.8868 0.9455 2.72 4.32 -1.2576
0 1 0.0514 0.0432 99.95 94.73 0.0002
1 1 0.0514 0.0457 99.91 89.46 0.
1 2 0.0515 0.0490 99.91 84.66 0.0006
1 3 0.0518 0.0531 99.20 76.96 0.0016
1 4 0.0523 0.0582 98.18 70.21 0.0033
1 5 0.0533 0.0645 96.36 63.35 0.0058
1 6 0.0550 0.0723 93.39 56.51 0.0094
1 7 0.0578 0.0821 88.87 49.77 0.0147
1 8 0.0624 0.0946 82.35 43.20 0.0222
1 9 0.0699 0.1139 73.53 36.85 0.0333
1 10 0.0823 0.1330 62.39 30.75 0.0486
1 11 0.1039 0.1641 49.45 24.91 0.0757
1 12 0.1434 0.2112 35.83 19.36 0.1189
1 13 0.2235 0.2902 22.99 14.09 0.1984
1 14 0.4175 0.4492 12.31 9.10 0.3740
1 15 1.1192 0.9282 4.59 4.40 0.9538
2 2 0.0516 0.0528 99.54 77.45 0.
2 3 0.0519 0.0576 99.08 71.00 0.0011
2 4 0.0524 0.0636 98.11 64.30 0.0028
2 5 0.0533 0.0711 96.16 57.50 0.0055

.....
 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 2 * 6 * 0.0550 * 0.0806 * 93.39 * 50.73 * 0.0095 *
 * 2 * 7 * 0.0579 * 0.0927 * 88.79 * 44.08 * 0.0154 *
 * 2 * 8 * 0.0627 * 0.1087 * 82.00 * 37.61 * 0.0241 *
 * 2 * 9 * 0.0707 * 0.1303 * 72.62 * 31.33 * 0.0374 *
 * 2 * 10 * 0.0848 * 0.1610 * 60.58 * 25.39 * 0.0581 *
 * 2 * 11 * 0.1106 * 0.2075 * 46.47 * 19.70 * 0.0928 *
 * 2 * 12 * 0.1622 * 0.2858 * 31.67 * 14.30 * 0.1564 *
 * 2 * 13 * 0.2848 * 0.4436 * 18.04 * 9.22 * 0.2954 *
 * 2 * 14 * 0.7133 * 0.9199 * 7.20 * 4.44 * 0.7472 *
 * 3 * 3 * 0.0521 * 0.0633 * 98.69 * 64.61 * 0. *
 * 3 * 4 * 0.0525 * 0.0705 * 97.83 * 57.98 * 0.0018 *
 * 3 * 5 * 0.0534 * 0.0797 * 96.19 * 51.27 * 0.0047 *
 * 3 * 6 * 0.0550 * 0.0916 * 93.36 * 44.62 * 0.0091 *
 * 3 * 7 * 0.0579 * 0.1073 * 88.77 * 38.10 * 0.0158 *
 * 3 * 8 * 0.0628 * 0.1286 * 81.77 * 31.78 * 0.0260 *
 * 3 * 9 * 0.0716 * 0.1590 * 71.74 * 25.71 * 0.0424 *
 * 3 * 10 * 0.0879 * 0.2052 * 58.47 * 19.92 * 0.0698 *
 * 3 * 11 * 0.1205 * 0.2830 * 42.63 * 14.44 * 0.1202 *
 * 3 * 12 * 0.1976 * 0.4402 * 26.00 * 9.29 * 0.2302 *
 * 3 * 13 * 0.4630 * 0.9152 * 11.10 * 4.47 * 0.5853 *
 * 4 * 4 * 0.0529 * 0.0795 * 97.14 * 51.45 * 0. *
 * 4 * 5 * 0.0537 * 0.0911 * 95.74 * 44.87 * 0.0030 *
 * 4 * 6 * 0.0551 * 0.1065 * 93.17 * 38.37 * 0.0078 *
 * 4 * 7 * 0.0579 * 0.1276 * 88.76 * 32.03 * 0.0154 *
 * 4 * 8 * 0.0629 * 0.1578 * 81.64 * 25.91 * 0.0277 *
 * 4 * 9 * 0.0725 * 0.2037 * 70.85 * 20.07 * 0.0487 *
 * 4 * 10 * 0.0921 * 0.2813 * 55.80 * 14.53 * 0.0876 *
 * 4 * 11 * 0.1385 * 0.4381 * 37.10 * 9.33 * 0.1730 *
 * 4 * 12 * 0.2981 * 0.9123 * 17.23 * 4.48 * 0.4481 *
 * 5 * 6 * 0.0543 * 0.1063 * 94.70 * 38.46 * 0. *
 * 5 * 6 * 0.0555 * 0.1272 * 92.58 * 32.15 * 0.0051 *
 * 5 * 7 * 0.0580 * 0.1571 * 88.62 * 26.02 * 0.0137 *
 * 5 * 8 * 0.0630 * 0.2028 * 81.61 * 20.16 * 0.0288 *
 * 5 * 9 * 0.0735 * 0.2802 * 69.91 * 14.59 * 0.0573 *
 * 5 * 10 * 0.0991 * 0.4367 * 51.87 * 9.36 * 0.1206 *
 * 5 * 11 * 0.1880 * 0.9104 * 27.33 * 4.49 * 0.3258 *
 * 6 * 6 * 0.0564 * 0.1569 * 91.15 * 26.06 * 0. *
 * 6 * 7 * 0.0584 * 0.2024 * 88.03 * 20.20 * 0.0095 *
 * 6 * 8 * 0.0630 * 0.2795 * 81.61 * 14.62 * 0.0284 *
 * 6 * 9 * 0.0747 * 0.4359 * 68.75 * 9.38 * 0.0713 *
 * 6 * 10 * 0.1170 * 0.9093 * 43.90 * 4.50 * 0.2128 *
 * 7 * 7 * 0.0595 * 0.2794 * 86.29 * 14.63 * 0. *
 * 7 * 8 * 0.0631 * 0.4355 * 81.42 * 9.39 * 0.0236 *
 * 7 * 9 * 0.0772 * 0.9087 * 66.59 * 4.50 * 0.1051 *
 * 8 * 8 * 0.0663 * 0.9084 * 79.93 * 43.60 * 0. *

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 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 19 * 0 * 0 * 0.0486 * 0.0386 * 100.00 * 100.00 * 0. *
 * 2 * 0 * 0.0487 * 0.0432 * 99.78 * 89.42 * -0.0007 *
 * 3 * 0 * 0.0490 * 0.0464 * 99.34 * 83.32 * -0.0015 *
 * 4 * 0 * 0.0494 * 0.0502 * 98.48 * 76.96 * -0.0028 *
 * 5 * 0 * 0.0502 * 0.0548 * 96.97 * 70.47 * -0.0047 *
 * 6 * 0 * 0.0514 * 0.0604 * 94.57 * 63.95 * -0.0073 *
 * 7 * 0 * 0.0535 * 0.0672 * 90.96 * 57.50 * -0.0110 *
 * 8 * 0 * 0.0567 * 0.0755 * 85.81 * 51.18 * -0.0162 *
 * 9 * 0 * 0.0617 * 0.0858 * 78.86 * 45.03 * -0.0234 *
 * 10 * 0 * 0.0695 * 0.0988 * 69.99 * 39.08 * -0.0335 *
 * 11 * 0 * 0.0819 * 0.1158 * 59.36 * 33.36 * -0.0480 *
 * 12 * 0 * 0.1023 * 0.1385 * 47.53 * 27.88 * -0.0696 *
 * 13 * 0 * 0.1373 * 0.1706 * 35.43 * 22.64 * -0.1030 *
 * 14 * 0 * 0.2017 * 0.2189 * 24.12 * 17.64 * -0.1588 *
 * 15 * 0 * 0.3344 * 0.2998 * 14.54 * 12.88 * -0.2624 *
 * 16 * 0 * 0.6686 * 0.4617 * 7.27 * 8.36 * -0.4950 *
 * 17 * 0 * 1.9709 * 0.9483 * 2.47 * 4.07 * -1.2911 *
 * 0 * 1 * 0.0487 * 0.0406 * 99.96 * 95.06 * 0.0002 *
 * 1 * 1 * 0.0487 * 0.0429 * 99.92 * 90.12 * 0. *
 * 1 * 2 * 0.0488 * 0.0457 * 99.76 * 84.49 * 0.0005 *
 * 1 * 3 * 0.0490 * 0.0493 * 99.33 * 78.41 * 0.0013 *
 * 1 * 4 * 0.0494 * 0.0536 * 98.47 * 72.06 * 0.0027 *
 * 1 * 5 * 0.0502 * 0.0589 * 96.97 * 65.59 * 0.0047 *
 * 1 * 6 * 0.0514 * 0.0654 * 94.54 * 59.10 * 0.0076 *
 * 1 * 7 * 0.0535 * 0.0733 * 90.84 * 52.68 * 0.0117 *
 * 1 * 8 * 0.0569 * 0.0832 * 85.52 * 46.40 * 0.0174 *
 * 1 * 9 * 0.0622 * 0.0959 * 78.24 * 40.29 * 0.0256 *
 * 1 * 10 * 0.0706 * 0.1123 * 68.85 * 34.39 * 0.0374 *
 * 1 * 11 * 0.0845 * 0.1345 * 57.54 * 28.72 * 0.0550 *
 * 1 * 12 * 0.1082 * 0.1658 * 44.97 * 23.30 * 0.0822 *
 * 1 * 13 * 0.1510 * 0.2131 * 32.21 * 18.13 * 0.1272 *
 * 1 * 14 * 0.2370 * 0.2923 * 20.52 * 13.21 * 0.2097 *
 * 1 * 15 * 0.4436 * 0.5117 * 10.96 * 8.55 * 0.3912 *
 * 1 * 16 * 1.1859 * 0.9319 * 4.10 * 4.14 * 0.9882 *
 * 2 * 2 * 0.0488 * 0.0490 * 99.61 * 78.87 * 0. *
 * 2 * 3 * 0.0490 * 0.0530 * 99.22 * 72.82 * 0.0009 *
 * 2 * 4 * 0.0494 * 0.0581 * 98.41 * 66.51 * 0.0023 *
 * 2 * 5 * 0.0502 * 0.0643 * 96.95 * 60.09 * 0.0045 *
 * 2 * 6 * 0.0514 * 0.0720 * 94.54 * 53.66 * 0.0076 *
 * 2 * 7 * 0.0536 * 0.0816 * 90.81 * 47.31 * 0.0121 *
 * 2 * 8 * 0.0570 * 0.0940 * 85.32 * 41.10 * 0.0186 *
 * 2 * 9 * 0.0624 * 0.1201 * 77.67 * 35.08 * 0.0281 *

.....
 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 2 * 10 * 0.0719 * 0.1319 * 67.65 * 29.29 * 0.0424 *
 * 2 * 11 * 0.0877 * 0.1627 * 55.45 * 23.73 * 0.0645 *
 * 2 * 12 * 0.1163 * 0.2095 * 41.82 * 18.44 * 0.1010 *
 * 2 * 13 * 0.1729 * 0.2881 * 28.13 * 15.41 * 0.1677 *
 * 2 * 14 * 0.3061 * 0.4464 * 15.89 * 8.65 * 0.3129 *
 * 2 * 15 * 0.7680 * 0.9240 * 6.33 * 4.18 * 0.7826 *
 * 3 * 3 * 0.0492 * 0.0578 * 98.88 * 66.81 * 0. *
 * 3 * 4 * 0.0495 * 0.0638 * 98.16 * 60.56 * 0.0015 *
 * 3 * 5 * 0.0502 * 0.0712 * 96.81 * 56.21 * 0.0037 *
 * 3 * 6 * 0.0515 * 0.0807 * 94.90 * 47.87 * 0.0071 *
 * 3 * 7 * 0.0536 * 0.0928 * 90.80 * 41.63 * 0.0122 *
 * 3 * 8 * 0.0571 * 0.1087 * 85.21 * 35.95 * 0.0197 *
 * 3 * 9 * 0.0630 * 0.1302 * 77.19 * 29.67 * 0.0310 *
 * 3 * 10 * 0.0733 * 0.1608 * 66.38 * 24.02 * 0.0487 *
 * 3 * 11 * 0.0919 * 0.2072 * 52.94 * 18.64 * 0.0781 *
 * 3 * 12 * 0.1287 * 0.2854 * 37.78 * 13.53 * 0.1317 *
 * 3 * 13 * 0.2146 * 0.4431 * 22.66 * 8.72 * 0.2481 *
 * 3 * 14 * 0.5079 * 0.9194 * 9.58 * 4.20 * 0.6219 *
 * 4 * 4 * 0.0498 * 0.0710 * 97.57 * 54.39 * 0. *
 * 4 * 5 * 0.0505 * 0.0802 * 96.40 * 48.15 * 0.0024 *
 * 4 * 6 * 0.0516 * 0.0921 * 94.29 * 41.93 * 0.0060 *
 * 4 * 7 * 0.0536 * 0.1078 * 90.77 * 35.83 * 0.0116 *
 * 4 * 8 * 0.0571 * 0.1291 * 85.18 * 29.91 * 0.0203 *
 * 4 * 9 * 0.0633 * 0.1595 * 76.79 * 24.22 * 0.0341 *
 * 4 * 10 * 0.0749 * 0.2057 * 64.97 * 18.78 * 0.0571 *
 * 4 * 11 * 0.0979 * 0.2836 * 49.69 * 13.62 * 0.0995 *
 * 4 * 12 * 0.1517 * 0.4410 * 32.07 * 8.76 * 0.1915 *
 * 4 * 13 * 0.2365 * 0.9166 * 14.54 * 4.21 * 0.4863 *
 * 5 * 5 * 0.0509 * 0.0919 * 95.49 * 42.03 * 0. *
 * 5 * 6 * 0.0519 * 0.1074 * 93.73 * 35.97 * 0.0038 *
 * 5 * 7 * 0.0537 * 0.1285 * 90.57 * 30.05 * 0.0100 *
 * 5 * 8 * 0.0571 * 0.1587 * 85.18 * 24.33 * 0.0202 *
 * 5 * 9 * 0.0636 * 0.2048 * 76.48 * 18.86 * 0.0375 *
 * 5 * 10 * 0.0769 * 0.2825 * 63.26 * 13.67 * 0.0696 *
 * 5 * 11 * 0.1084 * 0.4396 * 44.88 * 8.79 * 0.1399 *
 * 5 * 12 * 0.2160 * 0.9146 * 22.51 * 4.21 * 0.3661 *
 * 6 * 6 * 0.0526 * 0.1283 * 92.47 * 30.10 * 0. *
 * 6 * 7 * 0.0541 * 0.1584 * 89.93 * 24.39 * 0.0067 *
 * 6 * 8 * 0.0572 * 0.2042 * 85.10 * 18.91 * 0.0186 *
 * 6 * 9 * 0.0638 * 0.2818 * 76.26 * 13.71 * 0.0412 *
 * 6 * 10 * 0.0800 * 0.4388 * 60.79 * 8.80 * 0.0917 *
 * 6 * 11 * 0.1366 * 0.9136 * 35.60 * 4.23 * 0.2556 *
 * 7 * 7 * 0.0551 * 0.2040 * 88.34 * 18.93 * 0. *
 * 7 * 8 * 0.0575 * 0.2815 * 84.64 * 13.72 * 0.0137 *
 * 7 * 9 * 0.0639 * 0.4383 * 76.13 * 9.81 * 0.0454 *

.....
 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 7 * 10 * 0.0875 * 0.9129 * 55.60 * 4.23 * 0.1512 *
 * 8 * 8 * 0.0587 * 0.4381 * 84.93 * 8.82 * 0. *
 * 8 * 9 * 0.0639 * 0.9125 * 76.07 * 4.23 * 0.0500 *

* 20 * 0 * 0 * 0.0462 * 0.0366 * 100.00 * 100.00 * 0. *
 * 1 * 0 * 0.0462 * 0.0384 * 99.97 * 95.35 * -0.0002 *
 * 2 * 0 * 0.0463 * 0.0406 * 99.82 * 90.05 * -0.0006 *
 * 3 * 0 * 0.0464 * 0.0434 * 99.44 * 84.32 * -0.0013 *
 * 4 * 0 * 0.0468 * 0.0467 * 98.71 * 78.32 * -0.0023 *
 * 5 * 0 * 0.0474 * 0.0507 * 97.45 * 72.19 * -0.0039 *
 * 6 * 0 * 0.0484 * 0.0555 * 95.45 * 66.01 * -0.0060 *
 * 7 * 0 * 0.0499 * 0.0611 * 92.45 * 59.86 * -0.0090 *
 * 8 * 0 * 0.0524 * 0.0680 * 88.18 * 53.81 * -0.0131 *
 * 9 * 0 * 0.0561 * 0.0764 * 82.37 * 47.91 * -0.0187 *
 * 10 * 0 * 0.0617 * 0.0868 * 74.86 * 42.17 * -0.0263 *
 * 11 * 0 * 0.0703 * 0.0999 * 65.64 * 36.63 * -0.0370 *
 * 12 * 0 * 0.0839 * 0.1170 * 55.01 * 31.30 * -0.0522 *
 * 13 * 0 * 0.1059 * 0.1398 * 43.59 * 26.18 * -0.0746 *
 * 14 * 0 * 0.1433 * 0.1720 * 32.22 * 21.28 * -0.1093 *
 * 15 * 0 * 0.2115 * 0.2204 * 21.83 * 16.61 * -0.1668 *
 * 16 * 0 * 0.3512 * 0.3014 * 13.15 * 12.15 * -0.2731 *
 * 17 * 0 * 0.7003 * 0.4636 * 6.59 * 7.90 * -0.5111 *
 * 18 * 0 * 2.0525 * 0.9509 * 2.25 * 3.85 * -1.3228 *
 * 0 * 1 * 0.0462 * 0.0384 * 99.97 * 95.35 * 0.0002 *
 * 1 * 1 * 0.0462 * 0.0406 * 99.94 * 90.70 * 0. *
 * 1 * 2 * 0.0463 * 0.0429 * 99.79 * 85.41 * 0.0004 *
 * 1 * 3 * 0.0464 * 0.0459 * 99.43 * 79.69 * 0.0011 *
 * 1 * 4 * 0.0468 * 0.0497 * 98.71 * 73.71 * 0.0023 *
 * 1 * 5 * 0.0474 * 0.0542 * 97.45 * 67.59 * 0.0039 *
 * 1 * 6 * 0.0484 * 0.0596 * 95.43 * 61.43 * 0.0062 *
 * 1 * 7 * 0.0500 * 0.0662 * 92.38 * 55.31 * 0.0095 *
 * 1 * 8 * 0.0525 * 0.0743 * 87.98 * 49.29 * 0.0140 *
 * 1 * 9 * 0.0564 * 0.0863 * 81.94 * 43.42 * 0.0202 *
 * 1 * 10 * 0.0624 * 0.0970 * 74.05 * 37.22 * 0.0289 *
 * 1 * 11 * 0.0718 * 0.1136 * 64.31 * 32.73 * 0.0415 *
 * 1 * 12 * 0.0871 * 0.1359 * 53.04 * 26.94 * 0.0599 *
 * 1 * 13 * 0.1127 * 0.1673 * 40.96 * 21.88 * 0.0883 *
 * 1 * 14 * 0.1588 * 0.2147 * 29.07 * 17.04 * 0.1351 *
 * 1 * 15 * 0.2506 * 0.2943 * 18.43 * 12.44 * 0.2205 *
 * 1 * 16 * 0.4695 * 0.4540 * 9.84 * 8.06 * 0.4075 *
 * 1 * 17 * 1.2510 * 0.9352 * 3.68 * 3.91 * 1.0207 *
 * 2 * 2 * 0.0463 * 0.0457 * 99.46 * 80.13 * 0. *
 * 2 * 3 * 0.0465 * 0.0492 * 99.33 * 74.44 * 0.0007 *

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 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 2 * 4 * 0.0468 * 0.0534 * 98.64 * 68.48 * 0.0019 *
 * 2 * 5 * 0.0474 * 0.0587 * 97.63 * 62.40 * 0.0037 *
 * 2 * 6 * 0.0484 * 0.0650 * 95.43 * 56.29 * 0.0062 *
 * 2 * 7 * 0.0500 * 0.0729 * 92.36 * 50.23 * 0.0097 *
 * 2 * 8 * 0.0526 * 0.0827 * 87.87 * 44.28 * 0.0147 *
 * 2 * 9 * 0.0566 * 0.0951 * 81.59 * 38.48 * 0.0218 *
 * 2 * 10 * 0.0630 * 0.1114 * 73.26 * 32.86 * 0.0321 *
 * 2 * 11 * 0.0735 * 0.1333 * 62.85 * 27.45 * 0.0472 *
 * 2 * 12 * 0.0910 * 0.1644 * 50.72 * 22.27 * 0.0705 *
 * 2 * 13 * 0.1224 * 0.2119 * 37.73 * 15.09 * 0.1059 *
 * 2 * 14 * 0.1839 * 0.2902 * 25.11 * 12.61 * 0.1785 *
 * 2 * 15 * 0.3274 * 0.4489 * 14.10 * 8.15 * 0.3295 *
 * 2 * 16 * 0.8218 * 0.9276 * 5.62 * 3.95 * 0.8160 *
 * 3 * 3 * 0.0466 * 0.0532 * 99.04 * 68.78 * 0. *
 * 3 * 4 * 0.0469 * 0.0582 * 98.43 * 62.87 * 0.0012 *
 * 3 * 5 * 0.0475 * 0.0644 * 97.29 * 56.85 * 0.0030 *
 * 3 * 6 * 0.0484 * 0.0720 * 95.38 * 50.81 * 0.0057 *
 * 3 * 7 * 0.0500 * 0.0816 * 92.36 * 44.84 * 0.0096 *
 * 3 * 8 * 0.0526 * 0.0939 * 87.82 * 38.98 * 0.0153 *
 * 3 * 9 * 0.0568 * 0.1099 * 81.33 * 33.29 * 0.0235 *
 * 3 * 10 * 0.0637 * 0.1316 * 72.49 * 27.80 * 0.0357 *
 * 3 * 11 * 0.0754 * 0.1624 * 61.22 * 22.54 * 0.0547 *
 * 3 * 12 * 0.0964 * 0.2091 * 47.91 * 17.51 * 0.0860 *
 * 3 * 13 * 0.1374 * 0.2876 * 33.61 * 12.73 * 0.1427 *
 * 3 * 14 * 0.2320 * 0.4457 * 19.90 * 8.21 * 0.2651 *
 * 3 * 15 * 0.5528 * 0.9232 * 8.35 * 3.96 * 0.6564 *
 * 4 * 4 * 0.0472 * 0.0642 * 97.91 * 57.03 * 0. *
 * 4 * 5 * 0.0476 * 0.0716 * 96.92 * 51.09 * 0.0019 *
 * 4 * 6 * 0.0485 * 0.0811 * 95.17 * 45.16 * 0.0048 *
 * 4 * 7 * 0.0500 * 0.0931 * 92.30 * 39.30 * 0.0090 *
 * 4 * 8 * 0.0526 * 0.1090 * 87.82 * 33.58 * 0.0154 *
 * 4 * 9 * 0.0569 * 0.1305 * 81.16 * 28.04 * 0.0250 *
 * 4 * 10 * 0.0644 * 0.1611 * 71.75 * 22.72 * 0.0402 *
 * 4 * 11 * 0.0778 * 0.2076 * 59.32 * 17.63 * 0.0652 *
 * 4 * 12 * 0.1044 * 0.2858 * 44.25 * 12.81 * 0.1107 *
 * 4 * 13 * 0.1655 * 0.4437 * 27.90 * 8.25 * 0.2090 *
 * 4 * 14 * 0.3714 * 0.9205 * 12.43 * 3.98 * 0.5223 *
 * 5 * 5 * 0.0480 * 0.0809 * 96.13 * 45.26 * 0. *
 * 5 * 6 * 0.0488 * 0.0928 * 94.65 * 39.45 * 0.0030 *
 * 5 * 7 * 0.0502 * 0.1085 * 92.07 * 33.74 * 0.0076 *
 * 5 * 8 * 0.0526 * 0.1298 * 87.80 * 28.19 * 0.0148 *
 * 5 * 9 * 0.0570 * 0.1603 * 81.07 * 22.84 * 0.0264 *
 * 5 * 10 * 0.0650 * 0.2066 * 70.99 * 17.72 * 0.0457 *
 * 5 * 11 * 0.0812 * 0.2847 * 56.88 * 12.86 * 0.0812 *
 * 5 * 12 * 0.1187 * 0.4423 * 38.89 * 8.28 * 0.1582 *

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 * N * R1 * R2 * VARMU * VAR *RE MU * RE * COV MU *
 * SIGMA * SIGMA * SIGMA * SIGMA *

* 5 * 13 * 0.2455 * 0.9187 * 18.81 * 3.98 * 0.4039 *
 * 6 * 6 * 0.0494 * 0.1085 * 93.54 * 33.79 * 0. *
 * 6 * 7 * 0.0505 * 0.1293 * 91.43 * 28.26 * 0.0049 *
 * 6 * 8 * 0.0527 * 0.1598 * 87.62 * 22.90 * 0.0131 *
 * 6 * 9 * 0.0570 * 0.2060 * 81.05 * 17.77 * 0.0271 *
 * 6 * 10 * 0.0658 * 0.2839 * 70.18 * 12.89 * 0.0533 *
 * 6 * 11 * 0.0868 * 0.4414 * 53.21 * 8.29 * 0.1108 *
 * 6 * 12 * 0.1585 * 0.9175 * 29.14 * 3.99 * 0.2956 *
 * 7 * 7 * 0.0513 * 0.1597 * 90.00 * 22.93 * 0. *
 * 7 * 8 * 0.0531 * 0.2057 * 84.02 * 17.80 * 0.0090 *
 * 7 * 9 * 0.0570 * 0.2835 * 81.05 * 12.91 * 0.0264 *
 * 7 * 10 * 0.0668 * 0.4409 * 69.16 * 8.30 * 0.0657 *
 * 7 * 11 * 0.1013 * 0.9167 * 45.60 * 3.99 * 0.1938 *
 * 8 * 8 * 0.0541 * 0.2834 * 85.35 * 12.92 * 0. *
 * 8 * 9 * 0.0571 *

N	R1	R2	VAR MU	VAR SIGMA	RE MU	RE SIGMA	COV MU	COV SIGMA
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2	10	0.0566	0.0962	77.71	36.14	0.0250		
2	14	0.1288	0.2130	34.13	16.33	0.1164		
2	17	0.8748	0.9309	5.02	3.74	0.8476		
3	3	0.0443	0.0493	99.17	70.54	0.		
3	6	0.0457	0.0650	96.08	53.47	0.0047		
3	9	0.0520	0.0950	84.52	36.62	0.0183		
3	12	0.0780	0.1639	56.35	21.22	0.0606		
3	16	0.5973	0.9267	7.36	3.75	0.6891		
4	4	0.0448	0.0585	98.20	59.41	0.		
4	7	0.0470	0.0819	93.50	42.46	0.0072		
4	10	0.0572	0.1319	76.86	26.38	0.0297		
4	15	0.4086	0.9241	10.76	3.76	0.5562		
5	5	0.0455	0.0722	96.66	48.20	0.		
5	8	0.0489	0.1096	89.79	31.74	0.0113		
5	11	0.0671	0.2083	65.46	16.70	0.0536		
5	14	0.2758	0.9223	15.93	3.77	0.4393		
6	6	0.0465	0.0935	94.42	37.18	0.		
6	9	0.0521	0.1612	84.43	21.57	0.0192		
6	13	0.1820	0.9211	24.15	3.78	0.3330		
7	7	0.0481	0.1306	91.36	26.64	0.		
7	10	0.0577	0.2854	76.11	12.19	0.0385		
7	12	0.1177	0.9203	37.34	3.78	0.2335		
8	8	0.0503	0.2071	87.34	16.79	0.		
8	11	0.0773	0.9198	56.83	3.78	0.1385		
9	9	0.0534	0.4428	82.25	7.85	0.		
9	10	0.0579	0.9196	75.97	3.78	0.0459		

22	0	0	0.0419	0.0331	100.00	100.00	0.	
1	0	0.0419	0.0346	99.97	95.84	-0.0001		
4	0	0.0423	0.0411	99.05	80.65	-0.0017		
7	0	0.0443	0.0518	94.59	63.95	-0.0063		
10	0	0.0511	0.0696	82.02	47.61	-0.0172		
14	0	0.0887	0.1190	47.27	27.84	-0.0601		
18	0	0.3841	0.3041	10.92	10.89	-0.2930		
20	0	2.2085	0.9553	1.90	3.47	-1.3815		
1	0	0.0419	0.0346	99.97	95.84	0.0001		
1	4	0.0423	0.0433	99.05	76.52	0.0016		
1	7	0.0443	0.0554	94.56	59.86	0.0065		
1	11	0.0563	0.0862	74.47	38.43	0.0256		
1	15	0.1226	0.1700	34.20	19.49	0.0999		
1	19	1.3769	0.9409	3.05	3.52	1.0809		
2	2	0.0420	0.0403	99.75	82.27	0.		
2	6	0.0434	0.0545	96.70	60.83	0.0042		

N	R1	R2	VAR MU	VAR SIGMA	RE MU	RE SIGMA	COV MU	COV SIGMA
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2	10	0.0516	0.0846	81.26	39.17	0.0199		
2	14	0.0986	0.1672	42.51	19.82	0.0820		
2	18	0.9269	0.9339	4.52	3.55	0.8776		
3	3	0.0422	0.0459	99.28	72.13	0.		
3	7	0.0444	0.0657	94.54	50.41	0.0064		
3	10	0.0518	0.0960	80.98	34.52	0.0213		
3	14	0.1065	0.2124	39.36	15.60	0.1009		
3	17	0.6415	0.9299	6.54	3.56	0.7200		
4	4	0.0426	0.0538	98.43	61.56	0.		
4	7	0.0444	0.0731	94.46	45.36	0.0058		
4	10	0.0519	0.1113	80.78	29.77	0.0227		
4	13	0.0853	0.2109	49.17	15.71	0.0803		
4	16	0.4460	0.9273	9.40	3.57	0.5883		
5	5	0.0432	0.0651	97.09	50.87	0.		
5	9	0.0482	0.1106	86.99	29.95	0.0150		
5	13	0.0918	0.2885	45.69	11.48	0.1027		
5	15	0.3069	0.9256	13.66	3.58	0.4728		
6	6	0.0441	0.0822	95.15	40.30	0.		
6	9	0.0482	0.1319	86.96	25.13	0.0143		
6	12	0.0725	0.2877	57.84	11.52	0.0757		
6	14	0.2069	0.9244	20.27	3.58	0.3681		
7	7	0.0453	0.1101	92.48	30.08	0.		
7	10	0.0520	0.2088	80.59	15.87	0.0256		
7	13	0.1362	0.9236	30.79	3.59	0.2706		
8	8	0.0471	0.1621	88.99	20.44	0.		
8	12	0.0890	0.9231	47.12	3.59	0.1780		
9	9	0.0496	0.2868	84.55	11.55	0.		
10	10	0.0530	0.9227	79.08	3.59	0.		

23	0	0	0.0401	0.0316	100.00	100.00	0.	
1	0	0.0401	0.0329	99.98	96.66	-0.0001		
5	0	0.0407	0.0414	98.40	76.40	-0.0024		
9	0	0.0449	0.0574	89.27	55.16	-0.0104		
13	0	0.0635	0.0895	63.17	35.36	-0.0348		
16	0	0.1180	0.1430	33.98	22.12	-0.0887		
19	0	0.4003	0.3054	10.01	10.36	-0.3023		
21	0	2.2833	0.9572	1.76	3.31	-1.4087		
0	1	0.0401	0.0329	99.98	96.06	0.0001		
1	1	0.0401	0.0343	99.96	92.11	0.		
1	5	0.0407	0.0436	98.40	72.49	0.0023		
1	9	0.0450	0.0617	89.12	51.31	0.0110		
1	13	0.0648	0.1001	61.89	31.61	0.0385		
1	17	0.1832	0.2190	21.88	14.44	0.1568		

N	R1	R2	VAR MU	VAR SIGMA	RE MU	RE SIGMA	COV MU	COV SIGMA
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1	20	1.4377	0.9434	2.79	3.35	1.1088		
2	2	0.0402	0.0380	99.78	83.19	0.		
2	6	0.0413	0.0504	97.16	62.79	0.0036		
2	10	0.0477	0.0754	84.11	41.95	0.0162		
2	14	0.0801	0.1371	50.02	23.08	0.0608		
2	19	0.9782	0.9367	4.10	3.38	0.9063		
3	3	0.0403	0.0430	99.37	73.56	0.		
3	7	0.0421	0.0599	95.32	52.84	0.0053		
3	11	0.0519	0.0970	77.31	32.62	0.0243		
3	15	0.1120	0.2138	35.79	14.79	0.1079		
3	18	0.6853	0.9328	5.85	3.39	0.7495		
4	4	0.0406	0.0498	98.63	63.52	0.		
4	8	0.0433	0.0738	92.68	42.88	0.0078		
4	12	0.0589	0.1343	68.02	23.55	0.0385		
4	17	0.4833	0.9303	8.29	3.40	0.6188		
5	5	0.0411	0.0593	97.45	53.31	0.		
5	9	0.0450	0.0955	88.99	38.12	0.0118		
5	13	0.0729	0.2114	55.00	14.97	0.0684		
5	16	0.3383	0.9287	11.85	3.41	0.5045		
6	6	0.0419	0.0733	95.75	43.16	0.		
6	10	0.0478	0.1330	83.80	23.79	0.0187		
6	15	0.2327	0.9275	17.23	3.41	0.4013		
7	7	0.0429	0.0951	93.42	33.28	0.		
7	11	0.0527	0.2102	76.14	15.05	0.0333		
7	14	0.1563	0.9267	25.66	3.41	0.3055		
8	8	0.0444	0.1326	90.36	23.86	0.		
8	13	0.1030	0.9261	38.92	3.42	0.2150		
9	9	0.0464	0.2099	86.48	15.07	0.		
9	10	0.0482	0.2884	83.21	10.97	0.0120		
9	12	0.0692	0.9258	57.91	3.42	0.1277		
10	10	0.0491	0.4469	81.68	7.08	0.		
10	11	0.0528	0.9256	75.88	3.42	0.0424		

24	0	0	0.0384	0.0303	100.00	100.00	0.	
1	0	0.0384	0.0314	99.98	96.25	-0.0001		
5	0	0.0389	0.0390	98.61	77.56	-0.0020		
9	0	0.0423	0.0529	90.77	57.20	-0.0088		
13	0	0.0565	0.0796	68.02	38.01	-0.0282		
17	0	0.1223	0.1439	31.40	21.03	-0.0930		
22	0	2.3561	0.9589	1.63	3.16	-1.4348		
0	1	0.0384	0.0314	99.98	96.25	0.0001		
1	1	0.0384	0.0327	99.96	92.50	0.		
1	5	0.0389	0.0410	98.61	73.83	0.0020		

N	R1	R2	VAR MU	VAR SIGMA	RE MU	RE SIGMA	COV MU	COV SIGMA
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1	9	0.0424	0.0565	90.66	53.52	0.0092		
1	13	0.0573	0.0879	67.04	34.42	0.0308		
1	17	0.1331	0.1723	28.85	17.57	0.1105		
1	21	1.4972	0.9457	2.56	3.20	1.1355		
2	2	0.0385	0.0360	99.80	84.02	0.		
2	6	0.0394	0.0469	97.54	64.58	0.0030		
2	10	0.0444	0.0680	86.42	44.53	0.0133		
2	14	0.0679	0.1158	56.59	26.13	0.0467		
2	18	0.2291	0.2969	16.76	10.19	0.2172		
2	20	1.0286	0.9393	3.73	3.22	0.9336		
3	3	0.0386	0.0404	99.44	74.87	0.		
3	7	0.0400	0.0550	95.95	55.07	0.0044		
3	11	0.0476	0.0852	80.70	35.52	0.0195		
3	15	0.0876	0.1679	43.85	18.03	0.0768		
3	19	0.7286	0.9355	5.27	3.24	0.7775		
4	4	0.0389	0.0463	98.79	65.30	0.		
4	8	0.0410	0.0665	93.70	45.50	0.0065		
4	12	0.0526	0.1134	72.98	26.70	0.0297		
4	16	0.1345	0.2930	28.56	10.33	0.1507		
5	5	0.0393	0.0545	97.76	55.54	0.		
5	9	0.0424	0.0839	90.57	36.07	0.0095		
5	13	0.0616	0.1657	62.36	18.26	0.0490		
5	17	0.3701	0.9315	10.37	3.25	0.5346		
6	6	0.0399	0.0661	96.25	45			

T A B L E 4

COMPARISON OF EFFICIENCIES WITH DIFFERENT ESTIMATORS IN
 UNCENSORED SAMPLES UP TO SIZE TWENTY-FIVE
 FROM A LOGISTIC DISTRIBUTION

N	Eff. Rel. to Cramér-Rao Lower Bound		Eff. of Moment Estimators Rel. to $\hat{\mu}$ and $\hat{\sigma}$	
	$\hat{\mu}$	$\hat{\sigma}$	$\hat{\mu}$	$\hat{\sigma}$
	Eq. (3.3)	Eq. (3.4)	Eq. (3.5)	Eq. (3.8)
4	94.59	77.56	96.40	93.37
5	95.49	82.08	95.50	79.48
6	96.13	85.08	94.86	71.74
7	96.64	87.25	94.36	66.79
8	97.01	88.84	94.00	63.41
9	97.33	90.04	93.69	60.96
10	97.53	91.06	93.50	59.05
11	97.76	91.87	93.28	57.57
12	97.93	92.50	93.12	56.39
13	98.11	93.07	92.95	55.40
14	98.24	93.54	92.82	54.58
15	98.37	93.99	92.70	53.86
16	98.43	94.40	92.64	53.23
17	98.60	94.78	92.48	52.67
18	98.56	94.99	92.52	52.26
19	98.75	95.35	92.34	51.79
20	98.69	95.54	92.40	51.45
21	98.69	95.69	92.40	51.16
22	98.92	96.03	92.18	50.78
23	98.87	96.22	92.23	50.51
24	98.95	96.17	92.16	50.38
25	99.12	96.46	92.00	50.08