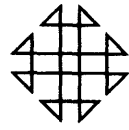
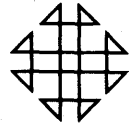
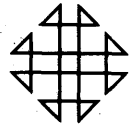
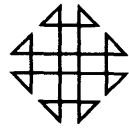
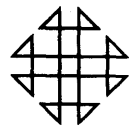
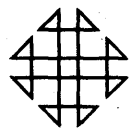
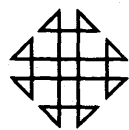
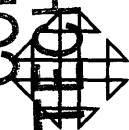
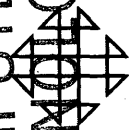
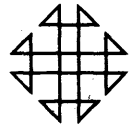
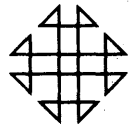
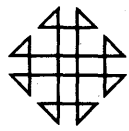
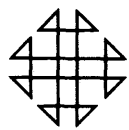
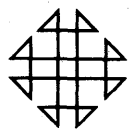
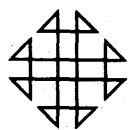
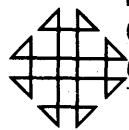
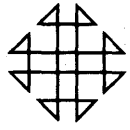
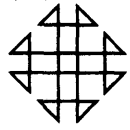
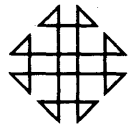
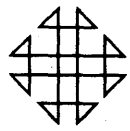
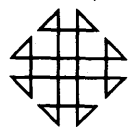
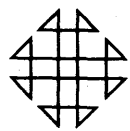
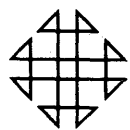
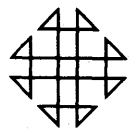
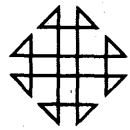
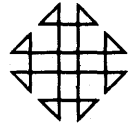
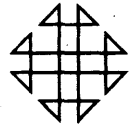
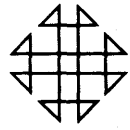
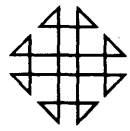
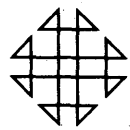
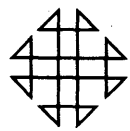
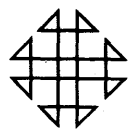
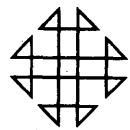
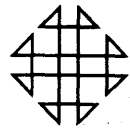
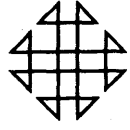
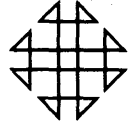
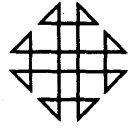
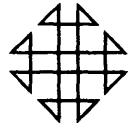
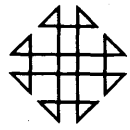
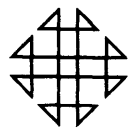
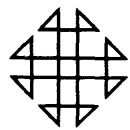
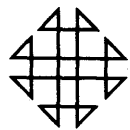
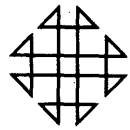
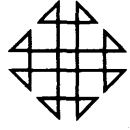
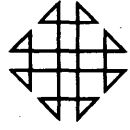
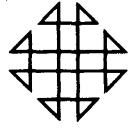
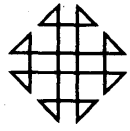
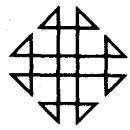
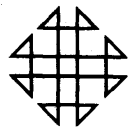
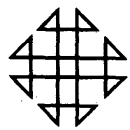
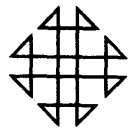
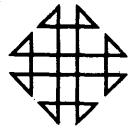
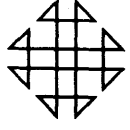
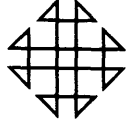
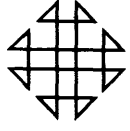
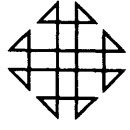
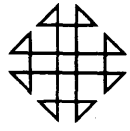
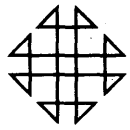
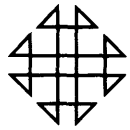
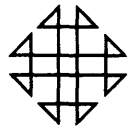
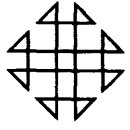
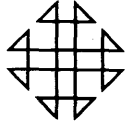
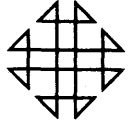
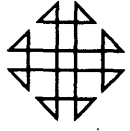
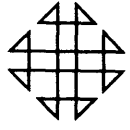
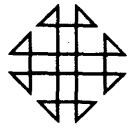
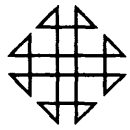
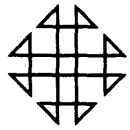
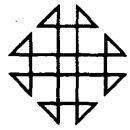
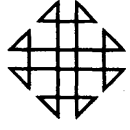
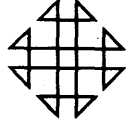
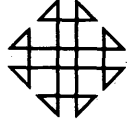
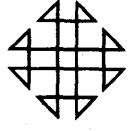
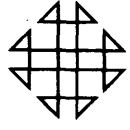
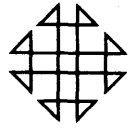
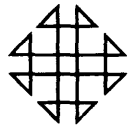
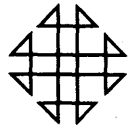
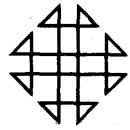
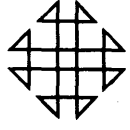
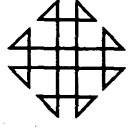
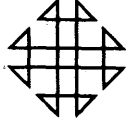
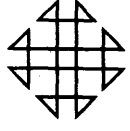
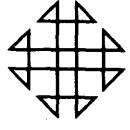
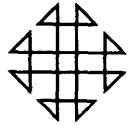
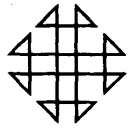
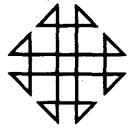
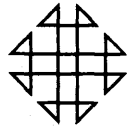
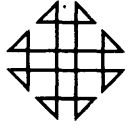
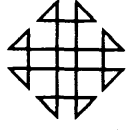
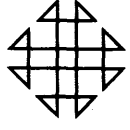
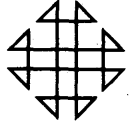
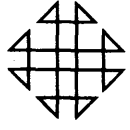
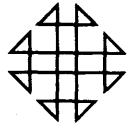
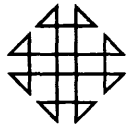
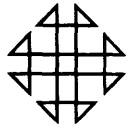
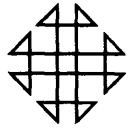
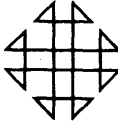
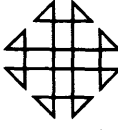
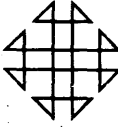
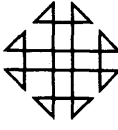
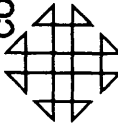
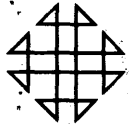
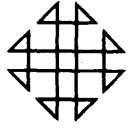
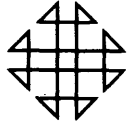
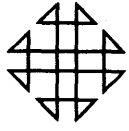
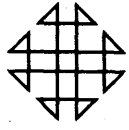
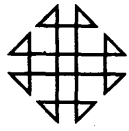
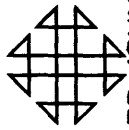
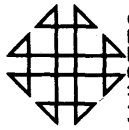


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COMPUTER
TECHNOLOGY

DISCLAIMER

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1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

Program No. _____

Date _____

Program Name: _____

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

Please return to:

Mr. Robert J. Robinson (PREP)
Marquette University
Computing Center
1515 W. Wisconsin Avenue
Milwaukee 3, Wisconsin

Your Name _____
Company _____
Address _____
User Group Code _____

THIS REVIEW FORM IS PART OF THE 1620 USER GROUP ORGANIZATION'S PROGRAM REVIEW AND EVALUATION PROCEDURE. NONMEMBERS ARE CORDIALLY INVITED TO PARTICIPATE IN THIS EVALUATION.

CORRELATION PROGRAM
FOR SYMMETRIC AND ASYMMETRIC MATRICES

Author: Mr. William E. Wright
Southern Illinois University
Data Processing Computer Center
Carbondale, Illinois

Deck Key

1. Program Deck

SOUTHERN ILLINOIS UNIVERSITY
 DATA PROCESSING AND COMPUTING CENTER
 CORRELATION PROGRAM
 FOR SYMMETRIC AND ASYMMETRIC MATRICES
 FOR THE IBM 1620
 PROGRAM ABSTRACT

I. **PURPOSE:** This program, which will handle up to 999 variables, will compute all possible simple pairwise correlation coefficients among a set of variables or between two sets of variables. The following quantities are computed and optionally punched: N , $\sum X_i$, $\sum X_i^2$, $\sum(X_i X_j)$, \bar{X}_i , σ_i , r_{ij} .

II. **LIMITATIONS:** Variables may be from one to ten digits in length. There may be as many as 999 variables and 99999 observations. Sums are accumulated as fixed-point numbers. Means and standard deviation coefficients are truncated to five decimals. Correlation coefficients are rounded to six decimals.

III. **MATHEMATICAL METHODS:** Standard Statistical Formula:

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

IV. **STORAGE REQUIREMENTS/SPEED:** At full capacity, the entire core (40 K) memory is utilized. The correlation coefficient output is about 300 per minute for large problems. All other output is at full punch speed. Running speed is inversely proportional to the number of ij pairs, to the maximum variable size, and to the number of observations. As an example, about 2.2 seconds are required to process observation in an intercorrelation of 23 variables, of maximum size A.

V. **REMARKS:** In problems involving a large number of variables, the data cards must be read in more than once.

VI. **EQUIPMENT SPECIFICATIONS:** The following are required: card input/output, 40K, indirect addressing, and move flag.

Programmed by
 William E. Wright
 October 1962

SOUTHERN ILLINOIS UNIVERSITY
 DATA PROCESSING AND COMPUTING CENTER
 CORRELATION PROGRAM
 FOR SYMMETRIC AND ASYMMETRIC MATRICES
 FOR THE IBM 1620

I. PURPOSE

This program, which will handle up to 999 variables, will compute all possible, simple, pair-wise correlation coefficients among a set of variables or between two sets of variables, without missing data. The following quantities are computed and punched: N , $\sum X_i$, $\sum X_i^2$, $\sum(X_i X_j)$, \bar{X}_i , σ_i , r_{ij} .

II. LIMITATIONS

- A. Size of variables:
Variables may be from one to ten digits in length.
- B. Number of variables:
The maximum number of variables is 999.
- C. Number of observations:
There may be as many as 99999 observations.
- D. Accuracy of results:
Sums are accumulated as fixed-point numbers. Means and standard deviations are truncated to five decimals. Correlation coefficients are rounded to six decimals.

III. MATHEMATICAL METHODS

$$\sigma_i = \sqrt{\frac{N \cdot \sum X_i^2 - (\sum X_i)^2}{N^2}}$$

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

IV. STORAGE REQUIREMENTS

The program, constants, work areas, add table, multiply table, and input area are stored in locations 00000 - 06725. The output area is location:

39920 - 39999. The word sizes are stored in locations succeeding 16725. The rest of the core is available for the summations. The storage required for intercorrelations equals $V \cdot (3 \cdot SM + 10) + 1/2 \cdot V \cdot (V-1) \cdot (2 \cdot SM + 5)$. The storage required for battery by battery correlations equals $(V_1 + V_2) \cdot (3 \cdot SM + 10) + V_1 \cdot V_2 \cdot (2 \cdot SM + 5)$. (V equals the number of variables, V_1 and V_2 equal the number of variables in battery 1 and battery 2, respectively, and SM equals the maximum variable size).

SPEED

The speed is inversely proportional to the number of ij pairs, to the maximum variable size, and to the number of observations. Approximately 2.2 seconds are required to process one observation in an intercorrelation of 23 variables of maximum size 4. Sums are punched at a speed of approximately 125 cards per minute. The number of sums per card depends on the maximum variable size (SM). For an SM of 4, approximately 5 pairs of means and standard deviations are punched per second. Correlation coefficients are punched at a speed of about 5 per second.

INPUT CARD FORMS

A. Parameter card(s)

(1) Intercorrelation

Column numbers

1-5	Numeric name of study
6-8	Number of variables
9-10	Size of variable 1
11-12	Size of variable 2
13-14	Size of variable 3
etc.	

(2) Battery by battery correlation

Column numbers

1-8	Same as intercorrelation
9-11	Number of first variable in battery 1 (i.e., if battery 1 begins with the fifth variable, 005 is the correct indication).

12-14	Number of variables in battery 1
15-17	Number of first variable in battery 2
18-20	Number of variables in battery 2
21-22	Size of variable 1
23-24	Size of variable 2
25-26	Size of variable 3
etc.	

If necessary, continue size indications on additional cards, beginning in column 1. A negative sign must be punched in column 1 of all parameter cards except the last one. (If there is only one parameter card, consider it the last one in this sense.) If all variable sizes are the same, place Program Switch 2 off and place the size in columns 9-10 for intercorrelations or 21-22 for battery by battery correlations.

B. Data cards

Column numbers

1-5	Ignored by the program but may be used for identification.
6-7	The sequence number of the card in the <u>observation</u> , beginning with 00. Blanks may be substituted for zeroes.
8-	These are the values of the variables being correlated. Negative signs indicating negative values should be punched over the units position. Each variable must take up exactly the number of digits specified for it on the parameter card. If the variables for a single observation occupy more than one data card, <u>do not</u> split up the last variable on the card. Instead, begin anew in column 8 of the next card.

The last data card in a study must be succeeded by a card with a 0-2-8 punch in column 1.

VII. OUTPUT CARD FORMS

The first card punched contains the name of the study. The next card contains the number of observations. Sums and sums of squares are punched

next, preceded by a blank card. Columns 1-3 of each card indicate "i" for the first variable whose sum is punched on that card. Sums and sums of squares are interlaced. The first statistic on each card is always a sum, and the last statistic on each card is always a sum of squares. Sums of cross products are punched next, preceded by a blank card. Columns 1-3 of each card indicate "i" for the first cross product punched on that card. Column 4 is blank; columns 5-7 indicate "j". Means and standard deviations are punched next, preceded by a blank card. The form is the same as for sums and sums of squares. Correlation coefficients, preceded and succeeded by a blank card, compose the last type of output. The form is the same as for sums of cross products.

Preceding each statistic except number of observations are either a blank and a blank if positive, or a blank and a negative sign if negative. No statistic will be split onto two cards. All excess spaces at the end of each card will be blank. N is 5 digits; ΣX_i , \bar{X}_i , and σ_i are SM + 5 digits. ΣX_i^2 and $\Sigma(X_i \cdot X_j)$ are 2 · SM + 5 digits. Correlation coefficients are 7 digits. Seven nines (9999999) will be punched for undefined correlation coefficients.

VIII. EQUIPMENT SPECIFICATIONS

The following features are required: card input/output, indirect addressing, 40K, and move flag. The program may easily be altered for 20K or 60K.

IX. TESTING

This program has been tested using intercorrelations, battery by battery correlations, uniform variable sizes, non-uniform variable sizes, sizes ranging from 01 to 10, multiple studies, multiple pass studies, and multiple card observations.

X. OPERATING INSTRUCTIONS

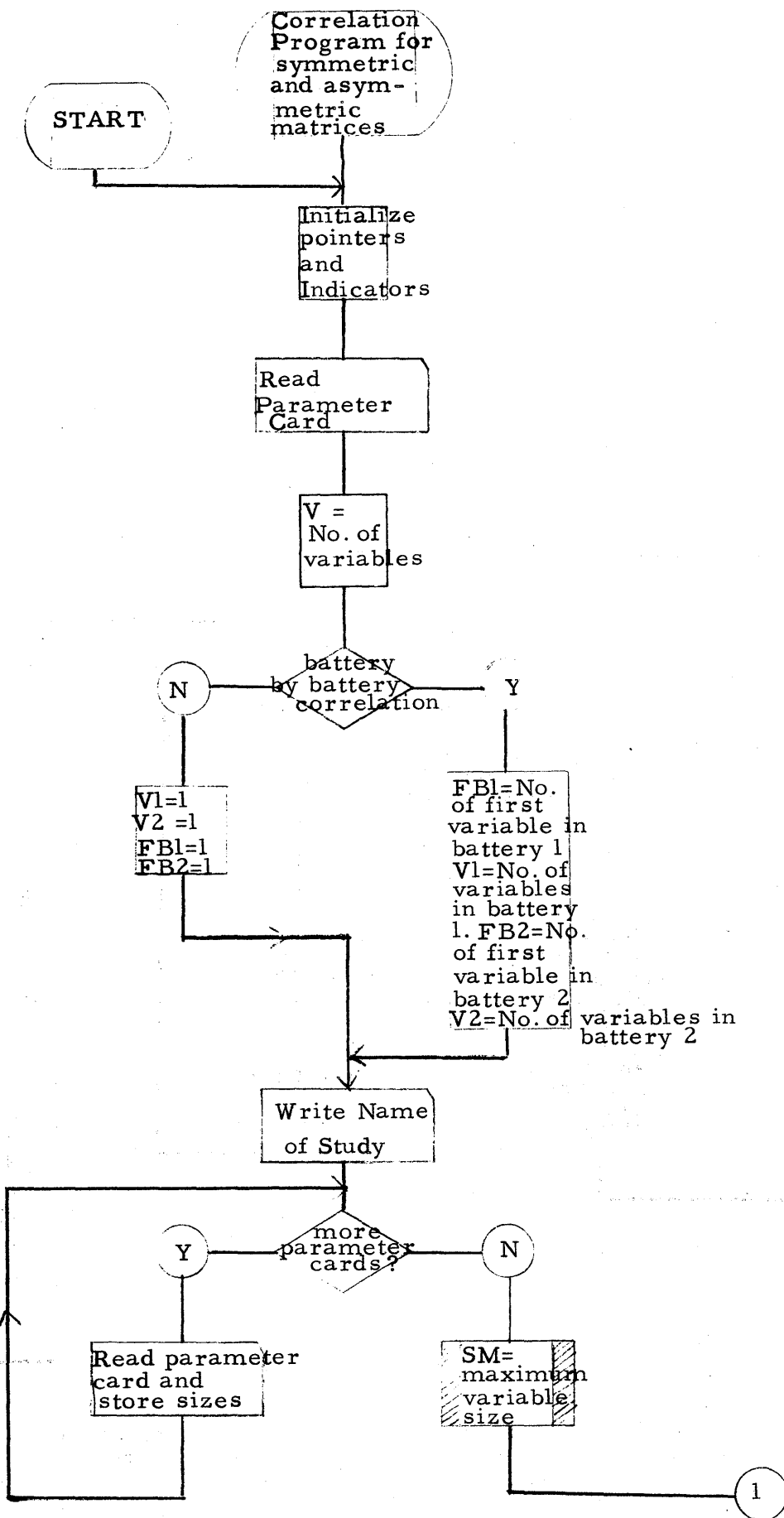
Place program in read hopper. Follow this by parameter card(s), data cards, and a card with a 0-2-8 punch in column 1, for each study. Place blank cards in punch hopper. Set switches:

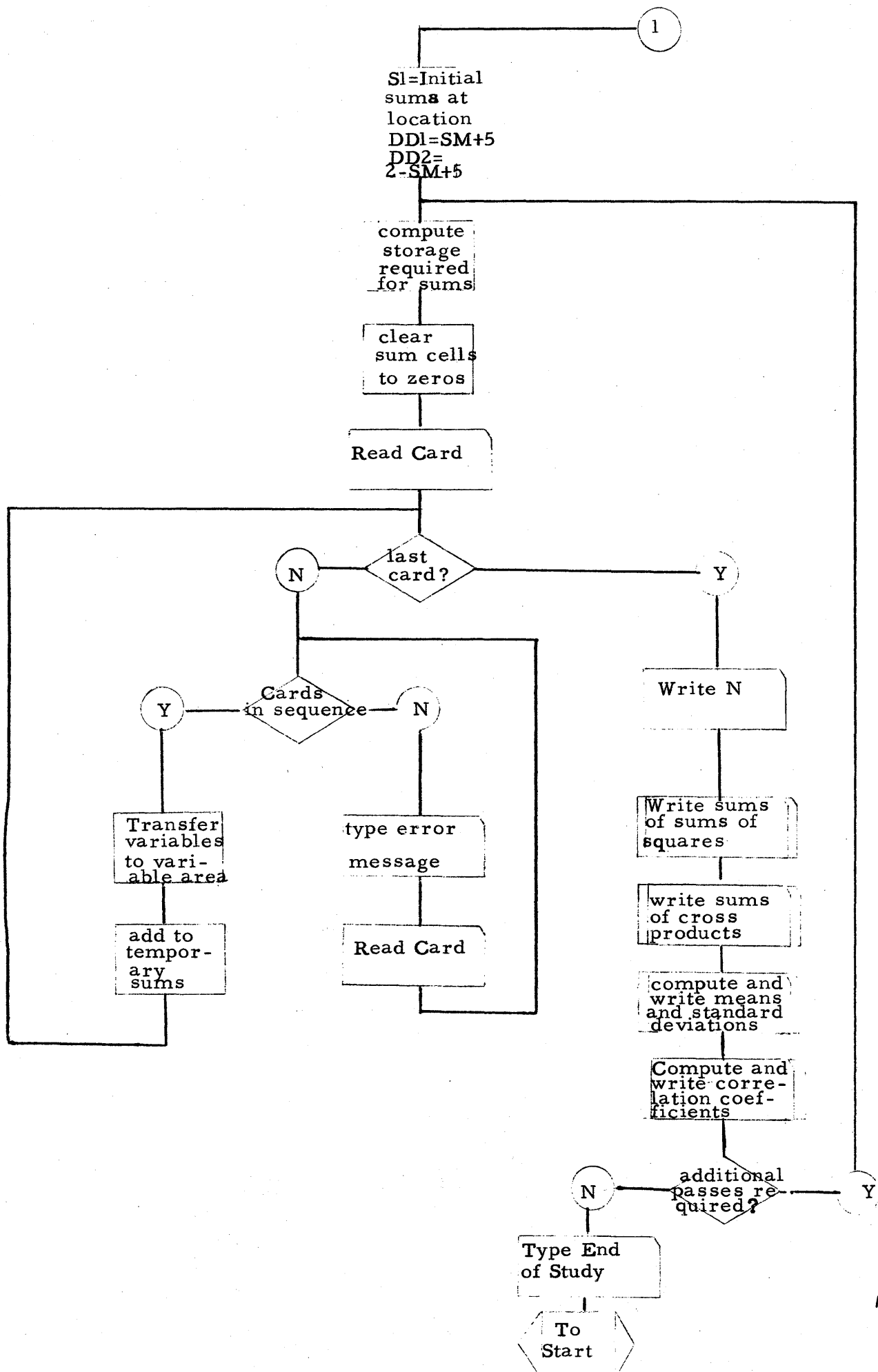
Parity switch-----stop
Input/output switch-----stop
Overflow switch-----program

Program Switch 1	off----symmetric matrix problem
	on----battery by battery problem
Program Switch 2	off----uniform variable sizes
	on----non-uniform variable sizes
Program Switch 3	off----no punching of sums and sums of squares.
	on----punching of sums and sums of squares
Program Switch 4	off----no punching of sums of cross products
	on----punching of sums of cross products

Press Reset Key and Load Key. When program deck has loaded, press Start Key and Punch Start Key. The Reader Start Key must be pressed to read in the last cards when the read hopper has emptied. If "CARD ORDER" is typed out, the data cards are out of order. Beginning with the next-to-last card in the read stacker, order the data cards, place them in the read hopper, and press Start Key. If "REREAD DATA" is typed out for a study, replace the data cards for that study in the read hopper (without parameter cards), press Start Key and Reader Start Key, and continue as before. The message "END OF STUDY" will be typed out after the completed punching for each study. If for some reason, such as detection of an error, it is desired to terminate processing, this may be done at any time by pressing the Instant Stop Key. To continue as for a new study, press Reset Key and Insert Key, type "4900402" and press Release Key and Start Key.

Programmed by:
William E. Wright
October, 1962





SPS LISTING

00402
 00402 16 06539 06755
 00414 16 00449 06762
 00426 15 03024 00000
 00438 32 02301 00000
 00450 36 06755 00500
 00462 32 06760 00000
 00474 26 00743 06762
 00486 46 00554 00100
 00498 16 00939 00001
 00510 16 01475 00001
 00522 26 00775 00743
 00534 26 00787 00743
 00546 49 00662 00000
 00554
 00554 32 06763 00000
 00566 32 06766 00000
 00578 32 06769 00000
 00590 32 06772 00000
 00602 26 00939 06765
 00614 26 00775 06768
 00626 26 01475 06771
 00638 26 00787 06774
 00650 11 00449 00012
 00662 26 00799 00775
 00674 31 39920 06360
 00686 26 39920 06759
 00698 33 39920 00000
 00710 35 39920 00400
 00722 44 00766 06539
 00734 11 06539 00000
 00746 36 06539 00500
 00758 49 00722 00000
 00766
 00766 16 01897 00002
 00778 11 06539 00001
 00790 16 06539 00000
 00802 26 06235 00449
 00814 11 06235 00001
 00826 32 06235 00000
 00838 11 06235 00001
 00850 14 06235 00000
 00862 46 00918 01200
 00874 24 06235 01897
 00886 47 00814 01100
 00898 26 01897 06235
 00910 49 00814 00000
 00918
 00918 16 02089 00002
 00930 11 00449 00002
 00942 13 01897 00006
 00954 11 00099 06434
 00966 26 06001 00099
 00978 32 06000 00000
 00990 32 05998 00000

DORG 402Z
 SSS152 TFM SP,BZ
 TFM P,B+7Z
 TDM SW2,0Z
 SF SW3Z
 RNCD BZ
 SF B+5Z
 TF V,B+7Z
 BC1 A1Z
 TFM FB1,1,9Z
 TFM FB2,1,9Z
 TF V1,VZ
 TF V2,VZ
 B A2Z
 DORG *-3Z
 A1 SF B+8Z
 SF B+11Z
 SF B+14Z
 SF B+17Z
 TF FB1,B+10Z
 TF V1,B+13Z
 TF FB2,B+16Z
 TF V2,B+19Z
 AM P,12,10Z
 A2 TF V3,V1Z
 TF W,BLZ
 TF W+4,B+4Z
 CF WZ
 DNCD WZ
 A4 BNF A3,SP,11Z
 AM SP,80,10Z
 RNCD SP,,6Z
 B A4Z
 DORG *-3Z
 A3 TFM SM,2,10Z
 AM SP,81,10Z
 TFM SP,0,610Z
 TF P1,PZ
 AM P1,1,10Z
 SF P1,,6Z
 AM P1,1,10Z
 CM P1,0,610Z
 BE A5Z
 C P1,SM,6Z
 BNP A3+48Z
 TF SM,P1,11Z
 B A3+48Z
 DORG *-3Z
 A5 TFM D,2,10Z
 AM P,2,10Z
 MM SM,6,9Z
 AM 99,OPSIZE-12Z
 TF V8,99,11Z
 SF V8-1Z
 SF V7-1Z

01002 16 00436 00000
 01014 26 00473 06235
 01026 46 01050 00200
 01038 16 02089 00000
 01050 23 00743 01897
 01062 21 00099 06235
 01074 26 00577 00099
 01086 26 00837 00577
 01098 16 01313 39919
 01110 22 01313 00577
 01122 16 01487 00005
 01134 21 01487 01897
 01146 26 02711 01487
 01158 21 02711 01897
 01170 23 01897 00939
 01182 21 00099 00473
 01194 22 00099 01897
 01206 26 04789 00099
 01218 23 01897 01475
 01230 21 00099 00473
 01242 22 00099 01897
 01254 26 02332 00099
 01266 26 06546 02711
 01278 21 06546 01487
 01290 26 06614 01313
 01302 33 03025 00000
 01314 46 02370 00100
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 01350 22 00099 00775
 01362 26 06576 00099
 01374 23 06546 00787
 01386 26 06533 00099
 01398 21 06533 00099
 01410 16 04880 00000
 01422 16 04904 00001
 01434 49 01454 00000
 01442
 01442 32 03025 00000
 01454 26 06539 06576
 01466 11 04880 00001
 01478 11 04904 00001
 01490 23 04880 04904
 01502 22 06539 00099
 01514 23 06539 02711
 01526 21 00099 06533
 01538 24 00099 06614
 01550 46 01442 01100
 01562 22 00775 04880
 01574 26 02337 04789
 01586 23 00775 01897
 01598 21 02337 00099
 01610 26 02369 02332
 01622 23 00787 01897
 01634 21 02369 00099
 01646 26 02593 02369

TFM V4,0,8Z
 TF BI,P1Z
 BC2 *+24Z
 TFM D,0,10Z
 M V,SMZ
 A 99,P1Z
 TF S1,99Z
 TF S5,S1Z
 TFM Q,W-1Z
 S Q,S1Z
 A6 TFM DD1,5,9Z
 A DD1,SMZ
 TF DD2,DD1Z
 A DD2,SMZ
 M SM,FB1Z
 A 99,BIZ
 S 99,SMZ
 TF B11,99Z
 M SM,FB2Z
 A 99,BIZ
 S 99,SMZ
 TF BIJ,99Z
 STORE TF TM1,DD2Z
 A TM1,DD1Z
 TF TM4,QZ
 CF SW1Z
 BC1 A9Z
 A TM4,QZ
 M V1,V1Z
 S 99,V1Z
 TF TM2,99Z
 M TM1,V2Z
 TF ST,99Z
 A ST,99Z
 TFM V10,0,9Z
 TFM V11,1,911Z
 B A7+12Z
 DORG *-3Z
 A7 SF SW1Z
 TF SP,TM2Z
 AM V10,1,10Z
 AM V11,1,10Z
 M V10,V11Z
 S SP,99Z
 M SP,DD2Z
 A 99,STZ
 C 99,TM4Z
 BP A7Z
 S V1,V10Z
 A8 TF E11,B11Z
 M V1,SMZ
 A E11,99Z
 TF EIJ,BIJZ
 M V2,SMZ
 A EIJ,99Z
 TF EI,EIJZ

01658 47 01682 00100
 01670 26 02593 02337
 01682 16 01453 06249
 01694 21 01453 01487
 01706 26 04289 01453
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 01730 44 01754 03024
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 01934 21 00565 01487
 01946 26 00565 01453
 01958 21 00565 02711
 01970 26 00565 04289
 01982 24 05113 02369
 01994 47 01922 01200
 02006 26 06674 00709
 02018 26 00589 00565
 02030 26 00565 00589
 02042 26 03733 04789
 02054 21 03733 01897
 02066 26 05113 03733
 02078 47 02102 00100
 02090 26 05113 02332
 02102 21 05113 01897
 02114 21 00565 02711
 02126 26 00565 04289
 02138 24 05113 02369
 02150 47 02102 01200
 02162 24 03733 02337
 02174 47 02054 01200
 02186 36 06675 00500
 02198 45 02218 06675
 02210 49 03254 00000
 02218
 02218 26 06041 00449
 02230 16 06546 00000
 02242 26 06235 00473
 02254 26 03151 00743
 02266 16 06036 06681
 02278 24 06546 06681
 02290 46 02534 01200
 02302 34 00000 00102

CLEAR

A34

A10

A11

RDDATA

A12

BNC1 *+24Z
 TF EI,EIIZ
 TFM DD3,BIGZ-25Z
 A DD3,DD1Z
 TF DD4,DD3Z
 A DD4,SMZ

 BNF *+24,SW2Z
 BNC1 A10-24Z
 TF S,S1Z
 TFM N,0Z
 TF P+,BIIZ
 A PI,SMZ
 A S,DD1Z
 TF S,DD3,611Z
 A S,DD2Z
 TF S,DD4,611Z
 C PI,EIZ
 BNE CLEAR+36Z
 TF S4,SZ
 BNC1 A10-48Z
 BD A10-24,SW2Z

 TF PIJ,BIJZ
 A PIJ,SMZ
 A S,DD1Z
 TF S,DD3,611Z
 A S,DD2Z
 TF S,DD4,611Z
 C PIJ,EIJZ
 BNE A34Z
 TF S8,S4Z
 TF S2,SZ
 TF S,S2Z
 TF PI,BIIZ
 A PI,SMZ
 TF PIJ,PIZ
 BNC1 *+24Z
 TF PIJ,BIJZ
 A PIJ,SMZ
 A S,DD2Z
 TF S,DD4,611Z
 C P+J,EIJZ
 BNE A11Z
 C PI,EIIZ
 BNE A10Z
 RDDATA RNCD RZ
 BNR *+20,RZ
 B TOTALSZ
 DORG *-3Z
 TF P2,PZ
 TFM TM1,0,10Z
 TF PI,BIZ
 TF I,VZ
 TFM T,R+6Z
 C TM1,R+6Z
 BE A13+12Z
 RCTY Z

02314 39 06289 00100
 02326 48 00000 00000
 02338 36 06675 00500
 02350 49 02278 00000
 02358
 02358 32 03025 00000
 02370 16 06533 00000
 02382 21 06533 00775
 02394 21 06533 00787
 02406 23 06533 06546
 02418 26 06533 00099
 02430 23 00775 00787
 02442 26 06576 00099
 02454 23 06576 02711
 02466 21 00099 06533
 02478 24 00099 06614
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 02514 49 02358 00000
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 02654 12 03151 00001
 02666 46 02522 01100
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 02690 47 02966 00100
 02702 11 03345 00001
 02714 26 00565 00577
 02726 26 03733 04789
 02738 21 03733 01897
 02750 21 00565 01487
 02762 21 00565 03733
 02774 21 00565 02711
 02786 23 03733 03733
 02798 21 00565 00099
 02810 24 03733 02593
 02822 47 02738 01300
 02834 47 02978 00100
 02846 43 02966 03024
 02858 26 05113 02332
 02870 21 05113 01897
 02882 21 00565 01487
 02894 21 00565 05113
 02906 21 00565 02711
 02918 23 05113 05113
 02930 21 00565 00099
 02942 24 05113 02369

A9

A13

SUMS

A16

A35

WATY AL1Z
 H Z
 RNCD RZ
 B A12+12Z
 DORG *-3Z
 SF SW1Z
 TFM ST,0,8Z
 A ST,V1Z
 A ST,V2Z
 M ST,TM1Z
 TF ST,99Z
 M V1,V2Z
 TF TM2,99Z
 M TM2,DD2Z
 A 99,STZ
 C 99,TM4Z
 BNP A8Z
 SM V1,1,10Z
 B A9-12Z
 DORG *-3Z
 A P2,DZ
 A P1,SMZ
 CM P2,1,610Z
 BE A14Z
 AM T,1,10Z
 SF T,,6Z
 SM T,1,10Z
 A T,P2,11Z
 CM T,R+79Z
 BP A15Z
 TF P1,T,611Z
 SM I,1,10Z
 BP A13Z
 BNF *+24,SW2Z
 BNC1 A17-24Z
 AM N,1,10Z
 TF S,S1Z
 TF PI,BI1Z
 A PI,SMZ
 A S,DD1Z
 A S,PI,611Z
 A S,DD2Z
 M PI,PI,611Z
 A S,99,6Z
 C PI,EIZ
 BN A16Z
 BNC1 A17-12Z
 BD A17-24,SW2Z
 TF PIJ,BIJZ
 A PIJ,SMZ
 A S,DD1Z
 A S,PIJ,611Z
 A S,DD2Z
 M PIJ,PIJ,611Z
 A S,99,6Z
 C PIJ,EIJZ

02954 47 02870 01300
 02966 26 00565 00589
 02978 26 03733 04789
 02990 21 03733 01897
 03002 26 05113 03733
 03014 47 03038 00100
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 03086 24 05113 02369
 03098 47 03038 01300
 03110 24 03733 02337
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 03134 49 02186 00000
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 03142 11 06036 00001
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 03166 46 03210 01100
 03178 25 03201 06036
 03190 16 06235 00000
 03202 49 02654 00000
 03210
 03210 11 06546 00001
 03222 22 06235 01897
 03234 36 06675 00500
 03246 49 02266 00000
 03254
 03254 31 39920 06360
 03266 26 04880 00436
 03278 21 00436 00775
 03290 44 03322 03024
 03302 47 03802 00100
 03314 49 03370 00000
 03322
 03322 26 39924 03345
 03334 33 39920 00000
 03346 35 39920 00400
 03358 26 39924 06365
 03370 26 00837 00577
 03382 35 39920 00400
 03394 47 03802 00300
 03406 26 00565 00577
 03418 26 01001 00709
 03430 26 39922 04880
 03442 11 39922 00001
 03454 49 03474 00000
 03462
 03462 21 39922 05997
 03474 26 01753 05997
 03486 16 06041 39924
 03498 21 06041 01487
 03510 21 00565 01487
 03522 26 06041 00565
 03534 27 06152 01487

BN A35Z
 TF S,S2Z
 TF PI,BIIZ
 A17 A PI,SMZ
 TF PIJ,PIZ
 BNC1 A18Z
 TF PIJ,RIJZ
 A18 A PIJ,SMZ
 A S,DD2Z
 M PI,PIJ,611Z
 A S,99,6Z
 C PIJ,EIJZ
 BN A18Z
 C PI,EIIZ
 BN A17Z
 B RDDATAZ
 DORG *-3Z
 A14 AM T,1,10Z
 CM T,R+79Z
 BP A15Z
 TD *+23,T,11Z
 TFM P1,0,610Z
 B SUMS-48Z
 DORG *-3Z
 A15 AM TM1,1,10Z
 S P1,SMZ
 RNCD RZ
 B A12Z
 DORG *-3Z
 TOTALS TR W,BLZ
 TF V10,V4Z
 A V4,V1Z
 BNF *+32,SW2Z
 BNC1 CRPRZ
 B XIXI2-12Z
 DORG *-3Z
 TF W+4,NZ
 CF WZ
 DNCD WZ
 TF W+4,BL+5Z
 TF S5,S1Z
 XIXI2 DNCD WZ
 BNC3 CRPRZ
 TF S,S1Z
 TF S7,S4Z
 TF W+2,V10Z
 AM W+2,1,10Z
 B *+20Z
 DORG *-3Z
 A19 A W+2,V6Z
 TF V9,V6Z
 TFM K,W+4Z
 A20 A K,DD1Z
 A S,DD1Z
 TF K,S,611Z
 BT SIGN,DD1Z

**COMPUTER
 TECHNOLOGY**

03546 21 06041 02711
 03558 21 00565 02711
 03570 26 06041 00565
 03582 27 06152 02711
 03594 24 00565 01001
 03606 46 03674 01200
 03618 12 01753 00001
 03630 46 03498 01100
 03642 35 39920 00400
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 03674 47 03778 00100
 03686 43 03778 03024
 03698 44 03778 02301
 03710 26 01001 00589
 03722 33 02301 00000
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 03778 35 39920 00400
 03790 31 39920 06360
 03802 35 39920 00400
 03814 47 04194 00400
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 03862 26 39926 39922
 03874 47 03898 00100
 03886 16 39926 00000
 03898 26 04904 39926
 03910 11 39926 00001
 03922 26 01753 05999
 03934 16 06041 39928
 03946 21 06041 02711
 03958 21 00565 02711
 03970 26 06041 00565
 03982 27 06152 02711
 03994 11 04904 00001
 04006 24 04904 00787
 04018 46 04122 01200
 04030 12 01753 00001
 04042 46 03946 01100
 04054 25 39923 06360
 04066 35 39920 00400
 04078 31 39927 06367
 04090 15 39923 00000
 04102 21 39926 05999
 04114 49 03922 00000
 04122
 04122 25 39923 06360
 04134 35 39920 00400
 04146 31 39924 06364
 04158 24 39922 00436

A36

CRPR

A24

A21

A22

A23

A K,DD2Z
 A S,DD2Z
 TF K,S,611Z
 BT SIGN,DD2Z
 C S,S7Z
 BE A36Z
 SM V9,1,10Z
 BP A20Z
 DNCD WZ
 TR W+3,BL+3Z
 B A19Z
 DORG *-3Z
 BNC1 CRPR-24Z
 BD CRPR-24,SW2Z
 BNF CRPR-24,SW3Z
 TF S7,S2Z
 CF SW3Z
 DNCD WZ
 TR W,BLZ
 TFM W+2,1,8Z
 B A19+12Z
 DORG *-3Z
 DNCD WZ
 TR W,BLZ
 CRPR DNCD WZ
 BNC4 MNSTDZ
 TF S,S2Z
 TF W+2,V10Z
 AM W+2,1,10Z
 TF W+6,W+2Z
 BNC1 *+24Z
 TFM W+6,0,8Z
 TF V11,W+6Z
 AM W+6,1,10Z
 A21 TF V9,V7Z
 TFM K,W+8Z
 A22 A K,DD2Z
 A S,DD2Z
 TF K,S,611Z
 BT SIGN,DD2Z
 AM V11,1,10Z
 C V11,V2Z
 BE A23Z
 SM V9,1,10Z
 BP A22Z
 TD W+3,BLZ
 DNCD WZ
 TR W+7,BL+7Z
 TDM W+3,0,11Z
 A W+6,V7Z
 B A21Z
 DORG *-3Z
 A23 TD W+3,BLZ
 DNCD WZ
 TR W+4,BL+4Z
 C W+2,V4Z

04170 47 03850 01200
 04182 26 39922 06363
 04194 35 39920 00400
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 04218 47 05194 00100
 04230 23 03345 03345
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 04358 21 06041 01487
 04370 21 00565 01487
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 04574 26 00079 06264
 04586 28 00094 06546
 04598 29 04436 06587
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 04622 22 06235 04436
 04634 26 06550 06281
 04646 26 06521 00089
 04658 16 04808 06523
 04670 16 04813 06552
 04682 16 04784 06525
 04694 26 00079 06259
 04706 13 06521 00005
 04718 26 06521 00099
 04730 21 04784 06235
 04742 26 06577 06276
 04754 22 04808 06235
 04766 16 06552 00005
 04778 32 06525 00000
 04790 11 04813 00010
 04802 22 06523 06552
 04814 46 04790 01300

MNSTD

A25

A26

D1

SQRT

B1

B4

B2

B3

BNE A24Z
 TF W+2,BL+3Z
 DNCD WZ
 BNF *+24,SW2Z
 BNC1 CORCOF+12Z
 M N,NZ
 TF TM3,99Z
 TF S,S1Z
 TF S7,S4Z
 SF SW3Z
 TF W+2,V10Z
 AM W+2,1,10Z
 B *+20Z
 DORG *-3Z
 A W+2,V8Z
 TF V9,V8Z
 TFM K,W+4Z
 A K,DD1Z
 A S,DD1Z
 TF ISUM,S,11Z
 LD 94,ISUMZ
 TFM D1+6,95Z
 S D1+6,SMZ
 D 95,NZ
 TF K,94,6Z
 BT SIGN,DD1Z
 A K,DD1Z
 A S,DD2Z
 S D1+6,SMZ
 TF 79,BIGZ-15Z
 M N,S,11Z
 TF TM1,99Z
 TF 79,BIGZ-15Z
 M ISUM,ISUMZ
 S TM1,99Z
 TF 79,BIGZ-10Z
 LD 94,TM1Z
 D D1+6,TM3,6Z
 TFM HUN,100Z
 S HUN,D1+6Z
 TF XM+29,ZEROSZ
 TF XM,89Z
 TFM B3+6,XM+2Z
 TFM B3+11,XCW-25Z
 TFM B4+6,XM+4Z
 TF 79,BIGZ-15Z
 MM XM,5,10Z
 TF XM,99Z
 A B4+6,HUNZ
 TF XCW,BIGZ+2Z
 S B3+6,HUNZ
 TFM XCW-25,5,1011Z
 SF XM+4Z
 AM B3+11,10,610Z
 S XM+2,XCW-25Z
 BNN B2Z

04826 21 0480# 04813
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 04850 44 04870 0480#
 04862 49 04914 00000
 04870
 04870 15 04813 00000
 04882 11 04813 000#1
 04894 15 04813 00005
 04906 49 04802 00000
 04914
 04914 12 04813 000#2
 04926 26 00565 04813
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 04962 27 06152 01487
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 05170 31 39920 06360
 05182 35 39920 00400
 05194 26 00565 00837
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 05230 11 39922 000#1
 05242 21 00565 01487
 05254 26 06629 00565
 05266 21 00565 02711
 05278 26 06669 00565
 05290 26 39926 39922
 05302 26 00601 00565
 05314 47 05350 00100
 05326 16 39926 0#000
 05338 26 00601 06674
 05350 26 04904 39926
 05362 11 39926 000#1
 05374 16 01753 000#8
 05386 16 06041 39928
 05398 11 06041 000#7
 05410 21 00601 01487
 05422 26 06644 0060+

A B3+6,B3+11,611Z
 AM B3+6,2,10Z
 BNF B6,B3+6,11Z
 B B7Z
 DORG *-3Z
 B6 TDM B3+11,0,6Z
 AM B3+11,1,10Z
 TDM B3+11,5,6Z
 B B3Z
 DORG *-3Z
 B7 SM RS,2,10Z
 TF S,RS,611Z
 S RS,SMZ
 TF K,RS,611Z
 BT SIGN,DD1Z
 C S,S7Z
 BE A37Z
 SM V9,1,10Z
 BP A26Z
 DNCD WZ
 TR W+3,BL+3Z
 B A25Z
 DORG *-3Z
 A37 BNC1 CORCOF-24Z
 BD CORCOF-24,SW2Z
 BNF CORCOF-24,SW3Z
 TF S7,S2Z
 CF SW3Z
 DNCD WZ
 TR W,BLZ
 TFM W+2,1,8Z
 B A25+12Z
 DORG *-3Z
 DNCD WZ
 TR W,BLZ
 CORCOF DNCD WZ
 TF S,S5Z
 TF S6,S2Z
 TF W+2,V10Z
 A27 AM W+2,1,10Z
 A S,DD1Z
 TF ISUM,S,11Z
 A S,DD2Z
 TF DEVI,S,11Z
 TF W+6,W+2Z
 TF S3,SZ
 BNC1 *+36Z
 TFM W+6,0,8Z
 TF S3,S8Z
 TF V11,W+6Z
 AM W+6,1,10Z
 A28 TFM V9,8,10Z
 TFM K,W+8Z
 A29 AM K,7,10Z
 A S3,DD1Z
 TF JSUM,S3,11Z

05434 21 00601 02711
 05446 26 06614 00601
 05458 26 00079 06259
 05470 21 00989 02711
 05482 23 03345 00989
 05494 26 06576 00099
 05506 26 00079 06259
 05518 23 06629 06644
 05530 22 06576 00099
 05542 26 00079 06281
 05554 23 06668 06613
 05566 14 00099 00000
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 05686 29 00092 06546
 05698 16 06235 00090
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 05746 12 06235 00001
 05758 71 06235 00099
 05770 26 06041 06235
 05782 17 06152 00007
 05794 11 04904 00001
 05806 24 04904 00787
 05818 46 05922 01200
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 05866 35 39920 00400
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 05890 15 39923 00000
 05902 11 39926 00008
 05914 49 05374 00000
 05922
 05922 25 39923 06360
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 05946 31 39924 06364
 05958 24 39922 00436
 05970 47 05230 01200
 05982 38 06360 00400
 05994 34 00000 00102
 06006 44 06110 03025
 06018 39 06311 00100
 06030 48 00000 00000
 06042 21 00939 00775
 06054 22 00799 00775
 06066 26 00775 00799
 06078 15 03024 00001

A33

A30

A S3,DD2Z
 TF TM4,S3,11Z
 TF 79,BIGZ-15Z
 A S6,DD2Z
 M N,S6,11Z
 TF TM2,99Z
 TF 79,BIGZ-15Z
 M ISUM,JSUMZ
 S TM2,99Z
 TF 79,ZEROSZ
 M DEVI-1,TM4-1Z
 CM 99,0,10Z
 BE A32Z
 TF TM1,99Z
 TF 79,ZEROS+6Z
 M TM1,TM3Z
 TFM HUN,100Z
 S HUN,DD2Z
 TF TM1,HUN,11Z
 TF 79,BIGZ-2Z
 LD 88,TM2Z
 D 92,TM1Z
 TFM HUN,90Z
 S HUN,DD2Z
 MF 99,HUN,11Z
 AM HUN,5,610Z
 SM HUN,1,10Z
 MF HUN,99,6Z
 TF K,HUN,611Z
 BTM SIGN,7,10Z
 AM V11,1,10Z
 C V11,V2Z
 BE A30Z
 SM V9,1,10Z
 BP A29Z
 TD W+3,BLZ
 DNCD WZ
 TR W+7,BL+7Z
 TDM W+3,0,11Z
 AM W+6,8,10Z
 B A28Z
 DORG *-3Z
 TD W+3,BLZ
 DNCD WZ
 TR W+4,BL+4Z
 C W+2,V4Z
 BNE A27Z
 WNCD BLZ
 RCTY Z
 BNF A31,SW1Z
 WATY AL2Z
 H Z
 A FB1,V1Z
 S V3,V1Z
 TF V1,V3Z
 TDM SW2,1,11Z

06090	26	00837	00565		TF	S5,SZ
06102	49	01122	00000		B	A6Z
06110					DORG	*-3Z
06110	39	06335	00100	A31	WATY	AL3Z
06122	49	00402	00000		B	SSS152Z
06130					DORG	*-3Z
06130	26	06044	02310	A32	TF	K,NINES,6Z
06142	49	05782	00000		B	A33Z
06152					DORG	*-1Z
06152	26	06235	06041	SIGN	TF	K1,KZ
06164	22	06235	06151		S	K1,SIGN-1Z
06176	44	06212	06044		BNF	*+36,K,11Z
06188	15	06235	00000		TDM	K1,0,6Z
06200	71	06235	06044		MF	K1,K,611Z
06212	11	06235	00001		AM	K1,1,10Z
06224	33	06235	00000		CF	K1,,6Z
06236	11	06041	00002		AM	K,2,10Z
06248	42	00000	00000		BB	Z
06250					DORG	*-9Z
06287		00038		DUM	DC	38,Z
06281		00032		ZEROS	DS	32,DUM-6Z
06274		00025		BIGZ	DS	25,ZEROS-7Z
06289		00011		AL1	DAC	11,CARD ORDER-Z
06311		00012		AL2	DAC	12,REREAD DATA-Z
06335		00013		AL3	DAC	13,END OF STUDY-Z
06360		00001		BL	DNB	1Z
06400		00040			DNB	40Z
06439		00039			DNB	39Z
06440		00001			DC	1,-Z
06446		00006		OPSIZE	DC	6,030604Z
06452		00006			DC	6,030503Z
06458		00006			DC	6,020403Z
06464		00006			DC	6,020403Z
06470		00006			DC	6,020302Z
06476		00006			DC	6,020302Z
06482		00006			DC	6,020302Z
06488		00006			DC	6,010202Z
06494		00006			DC	6,010202Z
06546		00052		TM1	DS	52Z
06576		00030		TM2	DS	30Z
06587		00011		TM3	DS	11Z
06614		00027		TM4	DS	27Z
06629		00015		ISUM	DS	15Z
06644		00015		JSUM	DS	15Z
06669		00025		DEVI	DS	25Z
06674		00005		S8	DS	5Z
06675		00001	00080	R	DSB	1,80Z
06755		00001		B	DS	1Z
02310		00007		NINES	DC	7,99999999,A12+44Z
06521		00027		XM	DS	27,TM1-25Z
06550		00029		XM1	DS	29,TM1+4Z
06577		00027		XCW	DS	27,TM2+1Z
06539		00006		SP	DS	6,TM1-7Z
06533		00006		ST	DS	6,TM1-13Z
00743		00003		V	DS	3,A4+21Z
00775		00003		V1	DS	3,A3+9Z

00787	00003	V2	DS	3,A3+21Z
00799	00003	V3	DS	3,A3+33Z
00436	00004	V4	DS	4,SSS152+34Z
00927	00003	V5	DS	3,A5+9Z
05997	00002	V6	DS	2,A30+75Z
05999	00002	V7	DS	2,A30+77Z
06001	00002	V8	DS	2,A30+79Z
01753	00002	V9	DS	2,CLEAR-1Z
04880	00004	V10	DS	4,B6+10Z
04904	00004	V11	DS	4,B6+34Z
00939	00003	FB1	DS	3,A5+21Z
01475	00003	FB2	DS	3,A7+33Z
39920	00005	W	DS	5,39920Z
01897	00002	SM	DS	2,A34-25Z
02089	00002	D	DS	2,A10+35Z
00473	00005	BI	DS	5,SSS152+71Z
00565	00005	S	DS	5,A1+11Z
00577	00005	S1	DS	5,A1+23Z
00589	00005	S2	DS	5,A1+35Z
00601	00005	S3	DS	5,A1+47Z
00709	00005	S4	DS	5,A4-13Z
00837	00005	S5	DS	5,A3+71Z
00989	00005	S6	DS	5,A5+71Z
01001	00005	S7	DS	5,A5+83Z
01313	00005	Q	DS	5,STORE+47Z
01487	00003	DD1	DS	3,A7+45Z
02711	00003	DD2	DS	3,SUMS+9Z
01453	00005	DD3	DS	5,A7+11Z
04289	00005	DD4	DS	5,A25-33Z
04789	00005	BII	DS	5,B4+11Z
02332	00005	BIJ	DS	5,A12+66Z
02337	00005	EII	DS	5,A12+71Z
02369	00005	EIJ	DS	5,A9-1Z
02593	00005	EI	DS	5,A13+71Z
03025	00001	SW1	DS	1,A18-13Z
03024	00001	SW2	DS	1,A18-14Z
02301	00001	SW3	DS	1,A12+35Z
03345	00005	N	DS	5,XIX12-37Z
00449	00005	P	DS	5,SSS152+47Z
06235	00005	P1	DS	5,SIGN+83Z
06041	00005	P2	DS	5,A31-69Z
03733	00005	PI	DS	5,A36+59Z
05113	00005	PIJ	DS	5,A37+59Z
03151	00003	I	DS	3,A14+9Z
06036	00005	T	DS	5,A31-74Z
06041	00005	K	DS	5,A31-69Z
06235	00005	K1	DS	5,SIGN+83Z
04813	00005	RS	DS	5,B3+11Z
06235	00005	HUN	DS	5,SIGN+83Z
00402		DEND	SSS152Z	

CONDENSED LISTING

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SAMPLE INPUT
BATTERY BY BATTERY CORRELATION

1000202300300800900504
 SSS010011112222333344445555666677778888999900001111222233334444*5555666677778888
 SSS0101999941111111111111
 SSS0200432154326543746432313467913697946323113134649797776463131979797974434343
 SSS0201999959999999994321
 SSS0300213131648799646799449787466231345497964131346797974431316979766431312644
 SSS030199992555555552131
 SSS0400979764641313679764310102101001010546497976433310001316679643487797431349
 SSS040199992 9797
 SSS0500001040437383993938282817120505271758883827278693939357240240101057505377
 SSS050199994000000000010

Z

SAMPLE OUTPUT

10002
00005

001	000027371	0000187574797	000035111	0000262265451
003	000028989	0000196191867	000022839	0000160186907
005	000023790	0000168154594	000022444	0000185028866
007	000024123	0000173566019	000024589	0000197128727
001	000024123	0000173566019	000024589	0000197128727
003	000015857	0000088907551	000026375	0000233642051
005	000023581	0000254562739		*

001	001	0000136762371	0000164019673	0000076706755	0000185029097	*	*
001	005	0000194794007					
002	001	0000148363451	0000192473276	0000120238714	0000216104236	*	*
002	005	0000199598480					
003	001	0000140877176	0000165376178	0000095776164	0000141463679	*	*
003	005	0000139505012					
004	001	0000147382292	0000123682148	0000043737765	0000110502387	*	*
004	005	0000126525945					
005	001	0000163826015	0000070957738	0000048623030	0000117730677	*	*
005	005	0000101769386					
006	001	0000169007784	0000046452413	0000036082876	0000102420001	*	*
006	005	0000081906032					
007	001	0000173566019	0000078403628	0000036988725	0000094181316	*	*
007	005	0000085847865					
008	001	0000078403628	0000197128727	0000096288401	0000169919508	*	*
008	005	0000185803049					

001	547420000	274737943	702220000	177251159	579780000	237147392	*	*
004	456780000	334254163	475800000	331547203	448880000	410566045	*	*
007	482460000	338178039	491780000	390397087	*			
001	482460000	338178039	491780000	390397087	317140000	277916034	*	*
004	527500000	434773334	471620000	535443791	*			

001	001	0101350	0548488	-0264495	0680578	0893323
002	001	-0701776	0572395	0360841	0801767	0716651

005	006	0000156992873	0000130186629	0000114848637	0000140877176	*	*
005	C10	0000165376178	0000095776164	0000141463679	0000139505012	*	*
005	014	0000059477496	0000107868153	0000100191602	0000096649995	*	*
005	018	0000020209904	-0000289861011	0000000086437	0000000927894	*	*
005	022	0000000084354	0000009363294	*			
006	007	0000132640493	0000125370525	0000147382292	0000123682148	*	*
006	C11	0000043737765	0000110502387	0000126525945	0000039201106	*	*
006	015	0000039794702	0000061577829	0000021798032	-0000003028792	*	*
006	019	-0000228367161	0000000075045	0000000954844	0000000086804	*	*
006	023	0000009635244					
007	008	0000173947713	0000163826015	0000070957738	0000048623030	*	*
007	012	0000117730677	0000101769386	0000046292392	0000017443637	*	*
007	016	0000062927050	0000038883421	-0000009276225	-0000237876210	*	*
007	020	0000000092952	0000001246421	0000000113311	0000012577521	*	*
008	009	0000169007784	0000046452413	0000036082876	0000102420001	*	*
008	013	0000081906032	0000035328719	-0000007017905	0000043942741	*	*
008	017	0000017601613	-0000025204978	-0000224417556	0000000093100	*	*
008	021	0000001239744	0000000112704	0000012510144			
009	010	0000078403628	0000036988725	0000094181316	0000085847865	*	*
009	014	0000023665624	0000001019333	0000030365313	0000001939151	*	*
009	018	-0000036686935	-0000241205877	0000000090729	0000001038301	*	*
009	022	0000000094391	0000010477401	*			
010	011	0000096288401	0000169919508	0000185803049	0000096214679	*	*
010	015	0000119656405	0000116121836	0000137932901	0000084641334	*	*
010	019	-0000245865411	0000000070247	0000000642224	0000000058384	*	*
010	023	0000006480624					
011	012	0000106711389	0000086849225	0000064968299	0000109254976	*	*
011	016	0000099093339	0000134381352	0000058178502	-0000158554143	*	*
011	020	0000000045338	0000000503085	0000000045735	0000005076585	*	*
012	013	0000231396181	0000148280938	0000113172386	0000169997123	*	*
012	017	0000193715052	0000131476226	-0000263723625	0000000095083	*	*
012	021	0000001319296	0000000119936	0000013312896			
013	014	0000148121651	0000104262826	0000168395081	0000168353066	*	*
013	018	0000139629590	-0000235786419	0000000082574	0000001267893	*	*
013	022	0000000115263	0000012794193	*			
014	015	0000076479737	0000117902314	0000140506389	0000108220726	*	*
014	019	-0000123897609	0000000046281	00000000748308	0000000068028	*	*
014	023	0000007551108					
015	016	0000153578438	0000175113930	0000090719000	-0000132846714	*	*
015	020	0000000021879	0000000518661	0000000047151	0000005233761	*	*
016	C17	0000188549274	0000126173664	-0000148625136	0000000042353	*	*
016	021	0000001138115	0000000103465	0000011484615			
017	018	0000153786346	-0000182881710	0000000054855	0000000823515	*	*
017	022	0000000074865	0000008310015	*			
018	019	-0000048245175	0000000015657	0000000477609	0000000043419	*	*
018	023	0000004819509					
019	020	-0000000169983	-0000001649835	-0000000149985	-0000016648335	*	*
020	021	0000000000649	0000000000059	0000000006549			
021	022	0000000001177	0000000130647	*			
022	023	0000000011877					

001	347400000	346653867	426500000	152530810	547420000	274737943	*	*
004	702220000	177251159	579780000	237147392	456780000	334254163	*	*
007	475800000	331547203	448880000	410566045	482460000	338178039	*	*
010	491780000	390397087	317140000	277916034	527500000	434773334	*	*
013	471620000	535443791	247820000	385336099	265720000	531455354	*	*

016	297280000	543055103	365800000	611174063	096500000	511712290	*	*
019	-999900000	000000000	000340000	000120000	003300000	003873499	*	*
022	000300000	000352136	033300000	039087133	*			
001	002	0830934	-0659890	-0140471	0089004	-0605371	-0255591	-0254387*-0482670
001	010	-0164373	0835176	-0063207	-0334990	0035273	0711837	0420243* 0586818
001	018	0124403	9999999	-0438141	-0023839	-0023839	-0023839	* * *
002	003	-0363341	0388469	-0289430	-0813949	-0332446	-0321730	-0709187*-0010347
002	011	0899408	0417333	0075549	0523827	0669258	0603443	0885523* 0565987
002	019	9999999	-0112436	0110032	0110032	0110032		
003	004	0437450	0158609	0586390	0147328	0043306	0101350	0548488*-0264495
003	012	0680578	0893323	0579259	-0033628	0401027	0064917	0527983* 9999999
003	020	0166316	0498257	0498257	0498257	*		
004	005	-0413854	-0435285	-0521224	-0517048	-0701776	0572395	0360841* 0801767
004	013	0716651	0844161	0209125	0380315	0667916	0854355	9999999* 0188302
004	021	-0044155	-0044155	-0044155		*		
005	006	0620101	-0196960	-0313814	0025358	0492842	0116541	-0222167* 0043898
005	014	-0270581	0489372	0217622	-0129597	-0127967	9999999	-0852185*-0062581
005	022	-0062581	-0062581					
006	007	0432635	0333021	0658070	0174180	-0617772	-0137256	0210227*-0270163
006	015	-0235228	-0069612	-0604511	-0293126	9999999	-0130021	0310731* 0310731
006	023	0310731						
007	008	0986749	0874918	-0711349	-0582242	-0107689	-0117494	-0198251*-0519529
007	016	-0086597	-0475149	-0379986	9999999	0606550	0718476	0718476* 0718476
008	009	0874712	-0797619	-0615165	-0178956	-0217839	-0256526	-0610970*-0204331
008	017	-0514081	-0446124	9999999	0681596	0627659	0627659	0627659* *
009	010	-0609413	-0840877	-0449804	-0308391	-0554299	-0701959	-0450288*-0835112
009	018	-0693045	9999999	0429300	0369854	0369854	0369854	* * *
010	011	0337461	0473829	0668177	0469019	0523606	0405870	0402232* 0609828
010	019	9999999	-0570172	-0223797	-0223797	-0223797		
011	012	0381786	0162147	0479433	0908866	0688476	0899313	0602990* 9999999
011	020	-0514292	-0037521	-0037521	-0037521	*		
012	013	0919312	0989870	0372962	0775834	0731857	0953118	9999999* 0207311
012	021	0533130	0533130	0533130		*		
013	014	0869336	0292400	0676078	0501720	0853116	9999999	0074661* 0472237
013	022	0472237	0472237					
014	015	0425359	0774795	0808298	0976395	9999999	0179566	0454784* 0454784
014	023	0454784						
015	016	0790562	0778997	0572880	9999999	-0730491	0077940	0077940* 0077940
016	017	0808534	0804856	9999999	-0251190	0615732	0615732	0615732* *
017	018	0870590	9999999	-0199916	0185813	0185813	0185813	* * *
018	019	9999999	-0024363	0321256	0321256	0321256		
019	020	9999999	9999999	9999999	9999999	*		
020	021	0378641	0378641	0378641		*		
021	022	1000000	1000000					
022	023	1000000						