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Statistical Program Package SPTSS : Conversational and Batch Unified Operation, Large Scale FACOM Extensions to SPSS

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中野嘉弘：会話型とバッチ型処理兼用の大規模統計プログラム・パッケージ SPTSS

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Abstract

SPTSS is a statistical program package of japanese FACOM extensions to SPSS. SPTSS contains 35 statistical subprograms (15 subprograms more than the original SPSS) and works in a unified manner for conversational mode as well as usual batch.

Attractive subprograms are, for examples, DATACLEAN, CLUSTER, XYPLOTTERs and HAYASIs (these are the multivariate analyses for nominal scale variables).

SPTSS also has many kinds of still more extended service routines than SPSS has for data handling, e. g. multiple choice and full-columed DOCUMENTS and LIST CASES facilities. Therefore, SPTSS may also be of use as a handy IR (information retrieval) or mini Data Base system.

§0 Introduction

This paper is a case study of a program package in the field of practical computer applications.

A preliminary report was presented in a poster session at the 1st international conference of SPSS users at Chicago in October, 1977.[1] SPSS is the most famous statistical program package developed by SPSS Inc., USA.[2] SPSS was originally batch oriented only. And SPSS Inc. now provides another special program package SCSS for use in conversational mode only.[3] I have heard the name SPSS/ONLINE, but merely by name, and I have no further information of it.*

* This is a CDC program.

Our program package SPTSS, developed by a japanese group, contains large scale extensions to SPSS and works in a unified operating mode in conversational as well as batch. SPTSS works from terminal typewriter or display terminals with prompting as SCSS does.

SPTSS has many more statistical subprograms by fifteen than original SPSS. They are Japanese subprorgrams : DATACLEAN,[4] CLUSTER, MULTIGRAM,[5] HAYASIs (multivariate analysis for nominal scale variables) etc. SPTSS has 35 subprograms in total. Among them the subprogram MULTIGRAPH is attractive, because it will convert map or diagram and/or any other documents for printing on LP to drawing in any scale on XYplottesr. Of coures, SPTSS has its own XYPLOTTER subprogram.

SPTSS has also many kinds of still more extended service routines for data handling : for example, multiple choice, full-size DOCUMENTS and LIST CASES facilities. Therefore, SPTSS may be of use as a handy IR (information retrieval) or mini Data Base system too.

SPTSS was realized on FACOM 230−75 at HUCC (Hokkaido University Computing Center, JAPAN).

§1 Statistical subprograms in SPTSS

Our SPTSS is provided with 35 statistical subprograms, whereas original SPSS has 20 subprograms and SCSS has only 7 ones.
They are compared in the following.

SCSS (Release 3 by SPSS Inc.)

1) UNIVARIATE	2) CROSSTABULATION	3) BREAKDOWN
4) CORRELATION	5) PARTIAL CORRELATION	6) REGRESSION
7) FACTOR	.....	.....

SPSS (Version 7 by SPSS Inc.)

1) CONDESCRIPTIVE	2) FREQUENCIES	3) AGGREGATE
4) CROSSTABS	5) MULT RESPONSE	6) T−TEST
7) BREAKDOWN	8) ONEWAY	9) ANOVA
10) NPAR TESTS	11) PEARSON CORR	12) NONPAR CORR
13) PARTIAL CORR	14) SCATTERGRAM	15) REGRESSION
16) FACTOR	17) CANCORR	18) DISCRIMINANT
19) GUTTMAN SCALE	20) RELIABILITY	
	.....	

SPTSS (Version 7, FACOM Extension to SPSS)

Added 15 subprograms to SPSS are in the following.

21) DATACLEAN	22) DATAPATTERN	23) TRIANGRAM
24) CONTOUR MAP	25) MULTIGRAM	26) MULTIGRAPH
27) XYPLOTTER	28) SURVIVAL	29) QFACTOR
30) CLUSTER	31) NONLINEAR MAP	32) HAYASI 1
33) HAYASI 2	34) HAYASI 3	35) HAYASI 4

Explanations of our subprograms are given in a later section.

§ 2 Operation and I/O Modes in SPTSS

Operation and I/O modes of our SPTSS are many-sided as shown in the following. (See Fig. 1, Fig. 2)

A. 1) Conversational demand mode (TSS mode)

2) Prompt real time terminal run.

3) Remote and central batch job.

B. 4) Tab set symbol @, to specify the 16th column.
This may be useful even for card input of batch jobs.

5) Common control statements with SPSS

6) Common output format with SPSS

7) Common system file and Archive file with SPSS

8) System file and work file allocations are available even half-way in to a run on TSS mode.

9) Input from a general file, which is constructed not only by SPSS or a Fortran job but by general file management routines, are available.

C. 10) Special use of keyword EDIT
EDIT @ T starts TSS mode run.

11) PAGESIZE NOEJECT is specified by default on TSS mode.
In batch mode, the 'NOEJECT' specification is available even if we have carelessly mispunched or column shifted in the specification field (in fact, any alphabetic string in place of 'NOEJECT' can be effective too).

12) PRINT BACK @ NO is specified by default in TSS mode.

13) PRINT FORMAT specification is available by default according to INPUT FORMAT FIXED ( ) statement. This is common in TSS mode as well as in batch job.

14) Space allocation information is printed out only when ALLOCATE TRANSPACE command is given (not by default).

D. 15) Syntax error checking and prompt revision are available in a run in TSS mode. This is just conversational. Mispunches in control field (column 1—8) are answered by double question marks '??'. Errors in specification fields (column 16—80) by '?? ERR NUMBER = and ERR COUNTS ='.

16) Input of single question mark '?' for inquiries from terminal KB (Key Board) print back corresponding error message, promptly.

14) LIST ERR @ n (n is the error number) command gives the same effect. This is of use at any step of a run and effective even if run has no error.

18) LIST ERR (without error number) command returns promptly all error messages which have already occured in a run.

19) EDIT @ 19 command additionally gives automatic saving of SPSS control statements on a disk after TSS run.

20) Further, EDIT @ 3 command initializes direct access file to allow repeatable

run from any point of SPTSS run by the following pointer commands. See Fig. 2,

POINTER @	*	present card,	* @ − n	pointer back from
	n	card number n		here by n cards
	GO	start from here		

21) Step by step execution of a SPSS run with direct data input from terminal KB is the most popular style in TSS mode. (See Fig. 1)

22) Automatic edition or saving in a disk of SPSS card decks including data is possible. These card decks are available to be used in another real time prompt run or usual batch job.

23) Alternating order of I/O sequences is adjustable by using dummy symbol ' ; ' or '+'.

24) These dummy symbols are of use in TSS mode in place of the READ INPUT DATA card, except at the first procedure in a run.

25) It must be noted that the READ INPUT DATA command is necessary on TSS mode at the first procedure of a run even if we begin with a GET FILE command.
This READ INPUT DATA command is requested to open the scratch data file.

E. New commands

26) VERSION gives informations of version or level in SPTSS.

27) MANUAL lists useful references or articles about SPSS and SPTSS.

28) HELP gives some helpful suggestions.

§3 Data I/O Routines

Our SPTSS has provided the following data I/O routines in addition to SPSS.

A. Filed data prepared by general file management routines can be input. This is available in the Archive file procedure also. Our SPTSS does not restrict input data to be prepared as Fortran oriented only.

B. New subprogram DATACLEAN checks card image data in the following formal aspects. (See Fig. 3)

1) Format checks : format misses (columnwise or in each format width), card ID, card seqnum, case seqnum, order of cards (record) in the same case.
matching of numbers among total cards, cases and records.

2) Data accumulation : this is similar to ADD CASES or ADD SUBFILE facilities.

3) Data blocksize conversion

4) DATACLEAN subprogram is effective to check data prepared especially via OCR.

C. INPUT FORMAT specifications
SPSS original : FIXED, FREEFIELD, BINARY
SPTSS extension : FORMAT permits Fortran formats. Undefined repeating format is available. BLANKCVT gives value of −0.0 to BLANK.

D. PRINT FORMAT specification is available by default according to INPUT FORMAT FIXED( ) specification.

E. AGGREGATE

FORMAT = BCD keyword produce BCD formatted AGGREGATE file.

F. LIST CASES

0) CASES = n (last case number) SPSS original

1) MCASE = m (starting case number) SPTSS extension

2) CASLIST = n1, n2,……n10 (selected cases number)

3) VARIABLES = varlist (to be reordered) SPTSS extension
(not reordered) SPSS original

Reordered variables set is more useful to compare the results of transformations of data.

4) DCM This new keyword read card image data with format (20A4) and lists out with (20A4) too. The output is formatted with neither variable names nor extra blanks. This makes SPTSS to be available as an IR or mini Data Base system too.

G. WRITE CASES

Some new output specifications have been added.

1) FORMAT ( ) specifys Fortran formats. Therefore unrestricted folding of the format is available now.

2) DCM Similarly for 'LIST CASES @ DCM' but realized onto BCD out put.

3) OPTIONS 3 does not round the last digit of numerical output.

§4 DOCUMENTS

Multiple choice of full-size (1—80 column) documentary information is available in our SPTSS. These facilities are very large extensions to original SPSS. It must be noted that in SPSS (original), column 1 through 15 of all cards must be left blank and only one set of DOCUMENT cards may be used on any run. No restrictions exist in our SPTSS. New cards of FULLDCMT and END DOCUMENT are provided to input multiple sets and/or group of sets of full-sized DOCUMENTS.

A. Input

1) FULLDCMT name1 for the lst set of documents (1—80 columns available) documentary cards.
FULLDCMT name2 end of the lst set and the start of the 2nd set documentary cards.
……

2) END DOCUMENT specifies the end of group of documentary sets.

Keyword FULLDCMT specifies the starting point or division of documentary sets to be input. The name specified may be used to pick up a special documentary set afterwards. END DOCUMENT indicates the group end of documentary sets. Multiple use of step (from FULLDCMT to END DOCUMENT) is available. Of course, this input must be done before the first statistical procedure.

Any SPSS card decks including data may be save filed as documetary information for reference at GET FLILE.

B. Output

1) LIST FILE DCMDIREC

This lists the directory of all documentary sets.

2) LIST FILE DOCUMENT dumps out all douments.

3) LIST FILE DOCUMENT name 1 [range1 [, range2]]

The specified subset of documents from name 1 in the range of (range1 through range2) may be dumped out. This is available immediately at terminal typewriters in the TSS mode of SPTSS. Therefore, SPTSS may be used be as a handy IR or mini Data Base system too. (See Fig. 5)

4) Writing out document cards onto BCD out put media :

RAW OUTPUT UNIT @ logical unit#

LIST FILE FDCMOUT name1 [card1 [, card2]]

§5 Data Handling in SPTSS

Miscellaneous data handling facilities are added to original SPSS.

A. List values vs. LIST CASES

While LIST CASES command lists values of the cited variables at the given seqnum, the inverse approach, searching for the corresponding case seqnum to the given value, this may be very useful at inital data cleanings.

New OPTIONS 20 in FREQUENCIES (general mode) gives just the reference index tables between code values and case seqnum of data for specified VARIABLES and for each SUBFILE.

RUN SUBFILES	EACH
FREQUENCIES	GENERAL = ALL or varlist
OPTIONS	20 5 9
(without STATISTICS card)	(See Fig. 4)

B. Case data updating in a system file

UPDATE IF (logical expression)

This is desighed by Prof. I. Miyake (Doshisha University, Kyoto) and extended by the author for multiple uses.

C. Matrix data I/O

1) CROSSTABS

Matrix data input is now available at CROSSTABS (integer mode) by the following new options. Up to triple crosstabulation may be produced by matrix input. STATISTICS calculations are also available. This facility serves as a kind of report generator.

CROSSTABS		(integer mode)
OPTIONS	10	Matrix data input
OPTIONS	11	Matrix data with weighting data
OPTIONS	20	Output of STATISTICS only

(See Fig. 6)

2) FACTOR

OPTIONS 3, 13 allows the correlation matrix input of only lower triangular part. This may simplify terminal operation.

3) DATA PATTERN

Multiple response counting tables are produced by options. These tables may be input again into CROSSTABS by the options mentioned above.

4) HAYASIs

Japanese subprogram HAYASIs correspond to REGRESSION, DISCRIMINANT, PCA (principal component analysis) and FACTOR for nominal scale data. Some matrix outputs from HAYASIs are available to do cross analysis with CROSSTABS.

§6 Additional procedures in SPTSS

This section is a complement of **§1.**

21) DATACLEAN (by Y. NAKANO, Hokkaido Kyoiku University)

This is a routine for formal checks of card image data and available to accumulate data similarly to ADD CASES procedure.

22) DATA PATTERN (by I. MIYAKE, Doshisha University)

This gives maximum of 18 dimensional BREAKDOWN in condensed form and also produces multiple responses tables by options.

23) TRIANGRAM (by N. NISHIWAKI, Kyoto University)

3-component scattergram.

24) CONTOUR MAP (by N. NISHIWAKI, Kyoto University)

3-dimensional or contour map.

25) MULTIGRAM (by S. KAMISHIMA, Hokkaido University)

Mulipurpose graphics printing routine on LP.

26) MULTIGRAPH (by S. KAMISHIMA, Hokkaido University)

General routine to prepare XYplotter run with SPTSS language. (See Fig. 7)

27) XYPLOTTER (by Y. NAKANO, Hokkaido Kyoiku University)

XYplotter routine for special purposes.

28) SURVIVAL (by Sachiko ITO, Hokkaido University)

Survival analysis and administration of inpatients in hospital.

29) QFACTOR (by K. YAMAMOTO, Kyoto University)

Q-mode factor analysis

30) CLUSTER

R-mode, Q-mode and BLOCK-mode (by K. YAMAMOTO, Kyoto University)

PCA-mode (by N. NISHIWAKI, Kyoto University)

31) NONLINEAR MAP (by K. YAMAMOTO, Kyoto University)

From multi-dimensional to 2-dimensional conversion of map by NLMA (nonlinear mapping algorithm)

32) HAYASI 1 (by I. MIYAKE, Doshisha University)
corresponds to Regression at nominal scale data.

33) HAYASI 2 (by I. MIYAKE, Doshisha University)
corresponds to Discriminant at nominal scale data.

34) HAYASI 3 (by I. MIYAKE, Doshisha University)
corresponds to PCA (Principal component analysis) at nominal scale data.

35) HAYASI 4 (by I. MIYAKE, Doshisha University)
corresponds to Factor at nominal scale data.

These HAYASIs are the famous method derived by Dr. Chikio HAYASI (director of the Institute of Statistical Mathematics, Tokyo) and called by alias as 'Quantification analysis'.

These HAYASIs programs have high popularity in Japan.

5−A) MULT ANS (by Y. NAKANO, Hokkaido Kyoiku Univ.)

This is a more practical substitute for the MULT RESPONSE subprogram implemented in the original SPSS. The differences between this and that are in the following.

a. MULT ANS subprogram is allowed to use its own input format specification and hence permits arbitrary characters of input data, not restricted to numerics.

b. The codes out of the specified range or not responsible to any category are picked up accompanied by the case number, group variable name and category name.

c. Frequency table sorted in the descending order of counts is also printed out. (See Fig. 8)

d. Self crosstabs of the responsive codes in a group variable is given to show similarities among the items in question. (See Fig. 9)

§7 Concluding Remarks and Acknowledgements

New Statistical Package SPTSS for conversational and batch unified operation has been made. SPTSS includes the service facilities corresponding to both SPSS (batch only) and SCSS (conversational only).

This SPTSS is a natural extension of the KYOTO version of SPSS6 and may be useful in the servicing levels corresponding to the original version of SPSS7. SPTSS has 35 statistical subprograms, that is 15 subprograms more than US original version.

These 15 subprograms are due to a Japanese reserch group. The author must express his sincere gratitude to them, especially Prof. I. MIYAKE (Doshisha University, coordinator of SPSS group in Japan), Drs,. K. YAMAMOTO, N. NISHIWAKI (Kyoto Univ.), S. KAMISHIMA and S. ITO (Hokkaido Univ.) for their excellent subprograms implemented in this SPTSS.

References

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4) Y. NAKANO ; Center News of Hokkaido University Computing Center, Vol. 11, No. 2, 1979, p. 18 (in Japanese)

5) . KAMISHIMA ; Manual of Library Programs of Hokkaido University Computing Center, No. 8, 1979 (in Japanese)

Fig. 1 SPTSS conversational run, CONDESCRIPTIVE with data input from terminal KB. Note the tabset symbol '@', EDIT @ T and the dummy symbol ' ; '.

```
#CALL PRØG/SPSS 'I'

        *** SPSS WØRK AREA=  1K WØRDS ***

STATISTICAL PACKAGE FØR THE SØCIAL SCIENCES HØKKAIDØ SPTSS7.8NØV

>EDIT@T
                    EDIT           T
        ***  SPSS  TSS MØDE START ***
>VARIABLE@V1 TØ V3
>INPUT FØ@FREEFIELD
>N ØF CAS@3
>CØNDESCR@V1

 ***** GIVEN WØRKSPACE ALLØWS FØR   68 VARIABLES FØR CØNDESCRIPTIVE PRØBLEM ***

>STATISTICS@1
>READ INP
>1 2 3 4 5 6 7 8 9

JAN.17, 1979    STATISTICAL PACKAGE SPTSS7

FILE   NØNAME   (CREATIØN DATE = JAN.17, 1979)


VARIABLE  V1

MEAN              4.000

VALID ØBSERVATIØNS -       3                    MISSING ØBSERVATIØNS -       0
>;
THIS TASK ENDED.

THE AMØUNT ØF TRANSPACE REQUIRED IS       0 WØRDS.

>FINISH


   NØRMAL END ØF JØB.
    7 CØNTRØL CARDS WERE PRØCESSED.
    0 ERRØRS WERE DETECTED.


       * END ØF FØRTRAN *
. ﾌﾟﾛｸﾞﾗﾑ ﾒｲ: SPSS     , ｶﾝﾘｮｳ ｺｰﾄﾞ: 000.
```

Fig. 2 SPTSS conversational repeated run by POINTER commands. Note the dummy symbols ' ; ', '+', POINTER @ *, @ *−2 and POINTER @ GO commands.

```
>INPUT FORMAT FIXED
        NCARD=   6   INPUT FORMAT        FIXED
>;
??ERROR NUMBER=  35,ERROR COUNTS = 1

>INPUT FORMAT FIXED(3A1)

        NCARD=   6   INPUT FORMAT        FIXED(3A1)
>N OF CASES 3

THE INPUT FORMAT PROVIDES FOR   3 VARIABLES.     3 WILL BE READ
IT PROVIDES FOR  1 RECORDS ('CARDS') PER CASE.  A MAXIMUM OF     3 'COLUMNS' ARE

        NCARD=   7   N OF CASES          3
>FREQUENCIES GENERAL=V1
        NCARD=   8   FREQUENCIES         GENERAL=V1
>OPTIONS 3
                     OPTIONS             3
>READ INPUT

GIVEN WORKSPACE ALLOWS FOR      89 TOTAL VALUES AND       8 LABELED VALUES PER VA

                     READ INPUT
>ABC
>DEF
>GHI
>*RECODE V1('A'=1)('D'=4)('G'=7)

>PRI
 POINTER *
>+
*** POINTER TO ICARD 10 FOR NCARD= 10
>*-2
>;
ICARD  8=FREQUENCIES     GENERAL=V1
>POINTER GO

>;
        NCARD=  11   FREQUENCIES         GENERAL=V1

GIVEN WORKSPACE ALLOWS FOR      89 TOTAL VALUES AND       8 LABELED VALUES PER VAI

FILE   SPTSSF    (CREATION DATE = JUN.14, 1977)


V1

                                                RELATIVE   ADJUSTED      CUM
                                 ABSOLUTE        FREQ       FREQ        FREQ
CATEGORY LABEL            CODE     FREQ          (PCT)      (PCT)       (PCT)

                           1.         1          33.3       33.3        33.3

                           4.         1          33.3       33.3        66.7

                           7.         1          33.3       33.3       100.0
                                    ------       ------     ------
                          TOTAL       3         100.0      100.0
```

Fig. 3 This is the simplest example in the service of DATACLEAN subprogram. Mispunches of alphabetic codes for numeric or unexpected strange codes are disclosed at the responsible columns. This procedure is useful for checking of data prepared especially by OCR.

```
STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES HOKKAIDO SPTSS7.8NOV                    MAR. 6, 1979        PAGE     1

                    DATACLEAN

*** DATACLEANING PROGRAM NEEDS     492 WORDS SPACE.
DATACL     MSK= 2  SMOD=0  PMOD=0  INPM=5  OUTM=0  MINN=0  MAXN=9  MINA=A  MAXA=Z  NGCOD=
                                                  CHECK COL & CODE:  0=  0=  0=  0=  0=  0=  0=  0=  0=  0=
     MASK CARD 1        A                                                                                SMOD=0    PAG
     MASK CARD 2        A                                                                                SMOD=0

 CARD CASE RECORD   ....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8   PMOD=0
    1    1      1 *(7812A2220114522 522222      1246      31213      1221 2 3 5101132311      235    )* ECHO:    1
    3    2      1                                 D
                     7812A2499115422 511212      92D68     31281236   1322 2 31617  3522 4     364
   13    7      1                          -
                     7812A2113122216 143223-     246893    411127     1121 4 6 9101631213      13456
   17    9      1                                 D
                     7812A2137112111 213222      1D8       32 12 5 6  2223 1 211121331215     4
   25   13      1                          -
                     7812A246712222812112l1 -                11122     1111 6 9      1     9    1
   45   23      1                                 R
                     7812A242612222111032232     128       6R 22236   1312 6 81517  1     19   5
   50   25      2 *(7812A23852111 7 9 914 26265646762566 710                                        )* ECHO:   50
   63   32      1                                   I
                     7812A2178112315 313211      916       3111456    4141 1111613 33131 5     451
  100   50      2 *(7812A222221 9 6 4 4 9135352225433444                                            )* ECHO:  100
  105   53      1                          -
                     7812A2307112214 6132338-    1268      72 826     1543 1 3 4 5153131 6     13
  127   64      1                          -
                     7812A2208112224 413221      68-       32113      1111 1 3 517  3131 3     23

  317  159      1                I      I
                     7812A2380113I110913I22      8         3138136    411102040516172731O3     13
  341  171      1                                                -
                     7812A2279122228 613222      14689     11-12356   5231 4 6 817  1     9    356
  350  175      2 *(7812A2378211614101310 85234346552353 710                                        )* ECHO:  350
  354  177      2 *(7812A234926 11416 2 3123534545543434                                            )*  END:  354

 CARD CASE RECORD   ....*....1....*....2....*....3....*....4....*....5....*....6....*....7....*....8   PMOD=0

TOTAL CARDS  354, N OF CAS  177, EACH  2 RECORDS
```

Fig. 4 Datacleaning facilities given by OPTIONS 20 in the general mode of FREQUENCIES subprogram. Reference table between data codes and the corresponding case seqnums is listed here. The codes larger than 100 may be got in by some mistakes. Note the commands of RUN SUBFILES EACH, PRINT FORMAT, OPTIONS 20, 5, 9 without STATISTICS card.

```
>PRINT FØ@INDEX14(1)

>FREQUENC@GENERAL=INDEX14
>ØPTIØNS@20 5
>READ INP

GIVEN WØRKSPACE ALLØWS FØR    627 TØTAL VALUES AND     62 LABELED VALUES PER VAF

FILE   FILE450  (CREATIØN DATE = JAN. 9, 1979)

INDEX14   ENGEL CØEFFICIENT

                SEQ SEQ                 SEQ SEQ                 SEQ SEQ
   CØDE   FREQ TØP END     CØDE   FREQ TØP END     CØDE   FREQ TØP END
   12.0      1  37   0     27.0     14  16 270     41.0      7  12 267
   13.0      1 106   0     28.0      9  43 273     42.0      6  14 180
   15.0      1  34   0     29.0     13  13 257     43.0      3 165 246
   16.0      1  63   0     30.0     16  17 250     44.0      3 160 217
   17.0      2 115 129     31.0     15  10 265     45.0      2 207 213
   18.0      5  15 253     32.0      6  29 218     46.0      2 118 169
   19.0      5  26 264     33.0     13  49 263     47.0      1 199   0
   20.0      5   9 175     34.0     13   5 261     48.0      1  20   0
   21.0      5  28 148     35.0     12   7 266     49.0      1  61   0
   22.0      6  23 235     36.0     14  24 259    100.0      1  93   0
   23.0      7  30 275     37.0      8  31 274   1750.0      1  96   0
   24.0     14  11 271     38.0      8   1 196   2050.0      1  92   0
   25.0     23   4 243     39.0      7  41 258   2080.0      1  94   0
   26.0     16   2 272     40.0      4   3 192   4400.0      1  95   0

VALID CASES     275      MISSING CASES     0
```

Fig. 5 Examples of the command FULLDCMT (multiple choice and full-sized documents). Note the commands lists of LIST FILE DCMDIREC and LIST FILE DOCUMENT name range1, range2.

```
¥¥CPS FJ0117,CORE://9
. FACOM 230 M-6/7 CPS(V10-L02) ｶｲｼ 79.01.17 14:39:08
+ ﾊﾟｽﾜｰﾄﾞ ?=■■■■■■■■■■
. YOUR JOB NO.= T12385
. CPS(V-10/L-02) ｼﾖｷﾋﾂﾃｲ ﾋｲｼﾞﾖｳ ｼｭｳﾘﾖｳ
. ｼｭﾂﾘﾖｸ ﾏﾁ:ﾅｼ
#A INSYSF,'FC0116.TEST2'
#A CPSMAC,CPS
#.CPST,G 'FJ0117.SPTSS7'
#CALL PROG/SPSS '1'


        *** SPSS WORK AREA=  1K WORDS ***

STATISTICAL PACKAGE FOR THE SOCIAL SCIENCES HOKKAIDO SPTSS7.8NOV

>EDIT@T
                    EDIT          T
        ***  SPSS   TSS MODE START ***
>GET FILE@TEST1


                    FILE TEST1    HAS  23 VARS,  7 SUBFILS.


                                 DOCUMENTS ARE  7 IN ALL.

>LIST FILE@SUBDIRECTORY


LIST OF THE   7 SUBFILES COMPRISING THE FILE..

HU67     N=      16     HU65     N=      31     DE67     N=      34     SC61

LA67     N=      10     AN73     N=      59
>LIST FILE@DCMDIREC


TATAL NUMBERS OF DOCUMENTS =  7 AND THEIR LIST..

HU67.15 = 1,    HU65.30 = 2,    DE67.33 = 3,    SC61.45 = 4,    WO58.48 = 5
LA67.9  = 6,    AN73.58 = 7,
>LIST FILE@DOCUMENT HU67.15 2,6


DUMP OF DOCUMENTARY INFORMATION..

FULLDCMT #  1 OF TOTAL  7, NAME= HU67.15  RANGE=   2,   6

OHU67     DEFOAMATION AND VOLUME CHANGE CHARACTERISTICS OF A SAND-ASPHAL
          T MIXTURE UNDER CONSTANT DIRECT AND TRIAXIAL COMPRESIVE STRESS
          ES;
 BI       H R R; NO 178  PP 60 - 74 (1967);
 FILE     BD26(HUANG);

**   5 OR (   2-   6) DOCUMENT WERE OUTPUT
```

Fig. 6 Example of the matrix data input in CROSSTABS integer mode subprogram. Note the extra dummy variables D1 TO D6 in VARIABLE LIST and OPTIONS 10.

```
>VARIABLE@X Y D1 TØ D6
>INPUT ME@CARD
>INPUT FØ@FIXED(8F4.0)
>;

THE INPUT FØRMAT PRØVIDES FØR   8 VARIABLES.    8 WILL BE READ
IT PRØVIDES FØR  1 RECØRDS ('CARDS') PER CASE.  A MAXIMUM ØF   32 'CØLUMNS' ARE USED ØN A RECØRD.

>CRØSSTABS@VARIABLES=Y(1,2)/X(1,8)/TABLES=Y BY X

>ØPTIØNS@3 4 5 10
>STATISTICS@ALL
>READ MATRIX

 ***** 'CRØSSTABS' PRØBLEM REQUIRES     16 WØRDS WØRKSPACE NØT INCLUDING VALUE LABELS *****

>  25  10   9   6  14   4  14  14
> 147 124  66  81 136  58 113 122
FILE   NØNAME   (CREATIØN DATE = NØV.12, 1977)

* * * * * * * * * * * * * * * * * *  C R Ø S S T A B U L A T I Ø N   Ø F  * * * * * * * * * * * * * *
     Y                                                          BY  X
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * PAGE
```

COUNT / Y	1	2	3	4	5	6	7	8	ROW TOTAL
1	25	10	9	6	14	4	14	14	96
									10.2
2	147	124	66	81	136	58	113	122	847
									89.8
COLUMN TOTAL	172	134	75	87	150	62	127	136	943
	18.2	14.2	8.0	9.2	15.9	6.6	13.5	14.4	100.0

```
RAW CHI SQUARE =     7.10783 WITH     7 DEGREES ØF FREEDØM.  SIGNIFICANCE =  0.4177
CRAMER'S V =  0.08682
CØNTINGENCY CØEFFICIENT =  0.08649
```

Fig. 7 Example of MULTIGRAPH, the special subrogram to prepare general XY-plotter run by SPTSS language. Note that RUN NAME, FILE NAME, SUBFILE NAMES and VALUE LABELS are drawn on XYplotter chart. Labels on X and Y axes are drawn out from DOCUMENT.

```
 VALUE LABELS   STATUS.H (1) YOKOZUNA     (2) OZEKI     (3) SEKIWAKE
                        (4) KOMUSUBI     (5) MAEGASHIRA  (6) JURYO/
 MISSING VALUES WIN.T LOSS.T (-1)
 DOCUMENT       *  NAMES FOR XYLABEL  *
                TOTAL WINS (IN MAKUUCHI)
                TOTAL LOSSES (IN MAKUUCHI)
ACTS ON SUMO STARS (NAGOYA-BASHO  JUNE 1978)

 MULTIGRAPH     XSCALE= 0(0) 10(500) */
                YSCALE= 0(0) 10(500) */
                SYMBOL= #14 #1 #0 #5 #2 J/
                H= HVAR/ PLOT= LOSS.T WIN.T STATUS.H/
                LINE= (0 0) (500 500) '--.'/
                FORM= XF.0 YF.0 X=2 Y=2 -GRID/
                FEED */ 1/ XYLABEL 3 2/ LEGEND= STATUS.H 16 (0)/ DRAW/
                -16.21/ FEED */1/XYLABEL 3 2/LEGEND STATUS.H 16 0/ DRAW/
                -16.21/ FEED */1/XYLABEL 3 2/LEGEND STATUS.H 16 0/ DRAW/
```

FACTS ON SUMO STARS (NAGOYA-BASHO JUNE 1978)

FILE NONAME (79-01-17)
SUBFILE EAST WEST

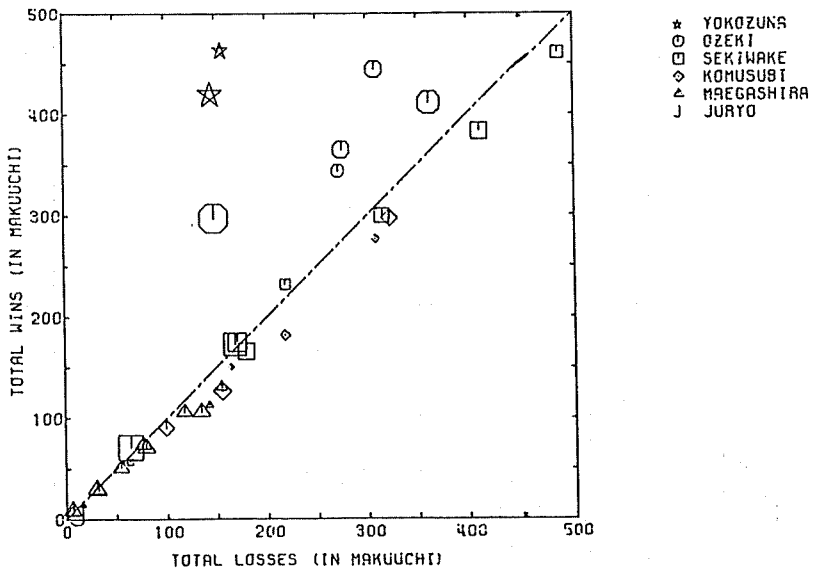

Fig. 8 Example of MULT ANS subprogram (japanese substitute for MULT RESPONSE subprogram of SPSS). Sorted frequency table of counts with code labels is listed here.

```
GVAR=  6 (MULT= 7 /  8 )  Q31        .YOUR PRIDES ABOUT JAPAN
        (WEIGHT=)  1.0  1.0  1.0  1.0  1.0  1.0  1.0
CODE LABELS

ITEM=  1     DILIGENT PEOPLE
ITEM=  2     AFFLUENT SOCIETY
ITEM=  3     FREEDOM GUARANTEED
ITEM=  4     LONG TRADITION
ITEM=  5     BEAUTIFUL COUNTRY
ITEM=  6     RENOUNCE WAR
ITEM=  7     WELL UNITED NATION
ITEM=  8     NO PRIDE

     ITEM=    1      2      3      4      5      6      7      8
     FREQ=   83.0   62.0   96.0   70.0  101.0   61.0    6.0    7.0
       % =   17.1   12.8   19.8   14.4   20.8   12.6    1.2    1.4


     SORTED MULTI FREQUENCIES

              BEAU   FREE   DILI   LONG   AFFL   RENO   NO P   WELL
              TIFU   DOM    GENT    TRA   UENT   UNCE   RIDE    UNI

     ITEM=    5      3      1      4      2      6      8      7
     FREQ=  101.0   96.0   83.0   70.0   62.0   61.0    7.0    6.0
       % =   20.8   19.8   17.1   14.4   12.8   12.6    1.4    1.2
     ACM%=   20.8   40.5   57.6   72.0   84.8   97.3   98.8  100.0

    ACCUM FREQ =     486 (    486.0 )    100.0%

    VALID CODES=     486  MISSING CODES=     753  TOTAL CODES=    1239  ANSWER RATE (CODE)=  39.23

    VALID CASES=     176  MISSING CASES=       1  TOTAL CASES=     177  ANSWER RATE (CASE)=  99.44
```

Fig. 9 OPTIONS 4 in MULT ANS subprogram gives "Self Crosstabs" among categories (individual variables) in one group variable. This table shows how closely these categories are responding.

```
SELF CROSS   GVAR(Y)= 6 (MULT= 7 /  8 )  @31        YOUR PRIDES ABOUT JAPAN
                        (WEIGHT=)  1.0  1.0  1.0  1.0  1.0  1.0  1.0

       BY    GVAR(X)= 6 (MULT= 7 /  8 )  @31        YOUR PRIDES ABOUT JAPAN
                        (WEIGHT=)  1.0  1.0  1.0  1.0  1.0  1.0  0.0

             1     DILIGENT PEOPLE
             2     AFFLUENT SOCIETY
             3     FREEDOM GUARANTEED
             4     LONG TRADITION
             5     BEAUTIFUL COUNTRY
             6     RENOUNCE WAR
             7     WELL UNITED NATION
             8     NO PRIDE
```

	Y	COUNT ADJST	COUNT	X	1 DILIGENT	2 AFFLUENT	3 FREEDOM	4 LONG TRA	5 BEAUTIFU	6 RENOUNCE	7 WELL UNI	8 NO PRIDE
DILIGENT	1	37.9	265.0		83.0	24.0	43.0	34.0	49.0	28.0	4.0	0.0
AFFLUENT	2	31.0	217.0		24.0	62.0	45.0	25.0	34.0	24.0	3.0	0.0
FREEDOM	3	46.9	328.0		43.0	45.0	96.0	37.0	59.0	43.0	5.0	0.0
LONG TRA	4	34.4	241.0		34.0	25.0	37.0	70.0	49.0	23.0	2.0	1.0
BEAUTIFU	5	47.1	330.0		49.0	34.0	59.0	49.0	101.0	35.0	3.0	0.0
RENOUNCE	6	31.1	218.0		28.0	24.0	43.0	23.0	35.0	61.0	4.0	0.0
WELL UNI	7	3.9	27.0		4.0	3.0	5.0	2.0	3.0	4.0	6.0	0.0
NO PRIDE	8	1.1	8.0		0.0	0.0	0.0	1.0	0.0	0.0	0.0	7.0
	SUM	233.4	1634.0		265.0	217.0	328.0	241.0	330.0	218.0	27.0	8.0
		ADJST	233.4		37.9	31.0	46.9	34.4	47.1	31.1	3.9	1.1