Chapter 1 AGREEMENT ANALYSIS

Machine Implementation

This chapter contains all the information necessary to perform simple or compound agreement analysis on any appropriate body of data. In its current form, the program can operate on a data base comprising as many as twenty-five cases and 300 test items. It can easily be modified to operate on a larger data base, subject only to the limitations of core storage available at the computer facility. The program can, moreover, perform any number of agreement analysis runs sequentially.

For each run, a card indicating some basic options is inserted before the data to be operated on (the details for this procedure are described later in this chapter in the section on input-output formats). The options include (a) whether a simple or compound agreement analysis is to be performed, and (b) whether an extra case (that is, one not in the agreement analysis itself) is to be read in and compared with the categories derived at the various levels of classification.

System Characteristics

The main program and all subroutines are written in FORTRAN IV (G-level) for execution on the IBM System/360 (Model 65) computer with an available core storage of approximately 450,000 bytes. The program consists of one main program and fifteen subroutines, totaling approximately 1,000 separate FORTRAN instructions. The total compilation time for the main program and the subroutines is about three and a half minutes. Execution time for one run of compound agreement analysis on eighteen cases defined by 300 items, yielding four hierarchical levels of classification, is from three to five minutes.

The array storage required for the program in its present form is 51,507 words. The general expression for determining the necessary core storage if the array dimensions are modified for the number of cases or the number of items is

---

Note: For a discussion of the characteristics and operation of agreement analysis, see Chapter 4 and Appendix C of Richard E. Barringer, with the collaboration of Robert K. Ramers, War: Patterns of Conflict (Cambridge, Mass.: The M.I.T. Press, 1972); hereafter cited as Barringer, War.

5(no. of cases) (no. of questions) + 29/2(no. of cases)^2 + 121 (no. of cases) + 5(no. of questions) + 420.

Since the program is designed to handle both the simple and the compound versions of agreement analysis, the array storage is the same regardless of the version used. A program designed exclusively for simple agreement analysis would need only one-half the storage required by this program to operate on an equivalent number of items and cases.

Input to the system is by means of punched cards. All input functions are performed by subroutine INPTR. Input formats can therefore be easily modified to accommodate any appropriate data base. The output of the system is both printed and punched on cards; these functions are performed by subroutines OUTPUT and OUTPC. The output from each run is in numerical form and must subsequently be translated into comprehensible language. This function is performed by the translation program described in Chapter 2. A separate program (instead of a subroutine) was required for this translation because of limitations in available core storage. While it would have been possible to include the translation program as a subroutine in the agreement analysis program as presently dimensioned, it would have eliminated the possibility of increasing array dimensions to operate on greater numbers of cases or items. In any event, the punched output from the agreement analysis program is used as input to the translation program with no further manipulation. The specific characteristics of both the input and the output decks are presented in the section on input-output formats.

Input Data Structure

The input data to the compound agreement analysis runs performed in War were taken from codebooks especially prepared and completed for this study. For machine storage purposes the 300 items in each codebook were first separated into 210 prescaled items and 90 items whose response alternatives were established only after their empirical coding.[1] The coded response of each principal party

---

1. The scaling technique used is discussed in Chapter 3 of Barringer, War.

to each of the 210 prescaled items at each threshold of each conflict was first punched onto standard electronic data processing cards. For each set of 210 data bits, three 80-column cards were used, the first 10 columns of each containing identification information. Once they had been established, the scaled responses to the remaining 90 items were punched on two additional cards (4 and 5), 70 on one and 20 on the other.

The five-card set containing the 300 item responses for one party to a case at a given threshold was followed by the five cards containing the 300 responses for the other party to the case at the same threshold. This set of data was followed by similar ten-card sets for each threshold crossed by each case. Thus a set of consecutive cards contains all the data for both parties to any case at all the thresholds at which it was coded: cards 1-5, the data for party 1, case 1, threshold 1, and cards 6-10, the data for party 2. For n thresholds, this yields 10n cards for case 1. Each additional case is similarly represented by ten cards for each of its thresholds.

The first ten columns of every card contain data identification information in the following format:

	A	A	B	C	C	D	D	E	E	F
Column	1	2	3	4	5	6	7	8	9	10

AA: case number, in two digits (e.g., 01)
B: party number (1 or 2)
CC: threshold number for this case, in two digits (e.g., 01)
DD: code for phase immediately preceding threshold, as:
  10 = phase I (P-I)
  20 = phase II (P-II)
  30 = phase III (P-III)
  32 = escalation (E)
  31 = de-escalation (D)
  40 = phase IV (P-IV)
  50 = settlement (S)
EE: code for phase immediately following threshold at hand (same as DD)
F: card number (1-5).

Before making an agreement analysis run, the cases and the threshold at which the analysis is to

be performed are determined. The appropriate ten data cards for each case to be included in the run are then submitted as input data to the agreement analysis program as indicated in the following section.

Input-Output Formats

Subroutine INPTR performs all input functions for agreement analysis runs, both simple and compound. Input is in punched card form, and there are two sections to the input deck for any set of runs. The first consists of the information required by all the runs, and the second of the information for each particular run to be performed.

The data formats for each set of runs are as follows:

1.
Number of runs and number of items

```
        A , B B B
Column 1  2 3 4 5
```

A: number of separate runs to be performed
BBB: number of items in the table of response alternatives (see 2)
Machine format: 980 FORMAT (I1, 1X, I3)

2.
Table of response alternatives for each item

This table contains the number of response alternatives for each item defining the cases to be examined. It is used by subroutine FACTOR to calculate the probabilistic correction factors in the corrected agreement scores. Each card contains the number of response alternatives for one item in the following format:

```
          A     B  B
Column 1 → 10  11 12
```

A: item number, punched in any format
BB: number of response alternatives
Machine format: 904 FORMAT (10X, I2)

For each run to be performed, the following deck setup is repeated:

3.
Comment card

This card describes the run to be performed in any manner desired; it is printed out at the beginning of the run for identification purposes.

COMMENT
Column 1 → 80

Machine format: 905 FORMAT (20A4)

4.
Parameter card

This card specifies the type (simple or compound) of agreement analysis to be performed, the number of cases, the number of items, and whether an extra case is to be included for comparison with the results of the analysis.

A , B B , C C C , D
Column 1 2 3 4 5 6 7 8 9 10

A: type of agreement analysis run
A = 0, simple agreement analysis
A = 1, compound agreement analysis
BB: number of cases to be included in the run
CCC: number of items defining each case
D: extra case option
D = 0, no extra case included
D = 1, extra case included
Machine format: 903 FORMAT (I1, 1X, I2, 1X, I3, 1X, I1)

5.
Data cards

These cards contain input data for a run, consisting of data cards describing (for compound agreement analysis) each party to each case to be included in the analysis and, if the option for an extra case has been specified, data cards describing both parties in the extra case. All the cards containing the response alternatives for one party to a case are read in, followed by all the cards containing the response alternatives for the other party. Each card is read in according to the following format:

A A B B B . . .
Column 1 2 11 12 13 . . .

AA: case identification number
B: response alternatives to codebook items for one party to a case; continued on other cards if necessary

Machine format: 902 FORMAT (I2, 8X, 70I1)

The input deck structure for a set of runs may be summarized as follows:

	Columns											
Set of runs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12 → 80**
1. No. of runs, no. of items	**A**		B	B	B							
2. No. of **response alternatives**											B	B
Each run												
3. Run description	**COMMENT**											
4. **Type, no. of** cases, no. of items, extra case	**A**	,	B	B		C	C	C	,	D		
5. Data	**A**	A									B	B
6. Extra case (if any)	**A**	A									B	B
3. Run description	**COMMENT**											
4. Type, no. of cases, no. of items, extra case	**A**	,	B	B		C	C	C		D		
and so on												

The output is performed by two subroutines, OUTPUT and OUTPC. Subroutine OUTPUT prints the results of the agreement analysis and punches the decks to be used as input to the translation program, and, if an extra case was included, cards

indicating the items for which it has the same response alternative as each of the category patterns derived in the analysis. The decks for any number of runs are read out consecutively and can be used as input to the translation program without any manipulation.

The output formats for each set of runs are as follows:

1.
Number of runs

```
        A
Column 2
```

A: total number of runs
Machine format: 380 FORMAT (1X, I1)

2.
Comment card

```
        COMMENT
Column 1 → 80
```

Machine format: 381 FORMAT (20A4)

3.
Parameter card

This card is the same as the input parameter cards and is punched in the following format:

```
        A , B B , C C C , D
Column 1 2 3 4 5 6 7 8 9 10
```

A: type of agreement analysis run
A = 0, simple agreement analysis
A = 1, compound agreement analysis
BB: number of cases in the run
CCC: number of items defining each case
D: extra case option
D = 0, no extra case included
D = 1, extra case included
Machine format: 382 FORMAT (I1, 1X, I2, 1X, I3, 1X, I1)

For each level of classification established in a run, the output formats are

4.
Description cards

A number of cards specifying the category number and level of classification are punched at this point. These cards are read by the translation program and are read out together with the translated cases and patterns.

5.
Cases in a category

The numbers of the cases included in a category are read out as follows:

```
          A A B B
Column 2  3 4 5
```

AA: identification number of case in the category
BB: identification number of case in the category
and so on
Machine format: 950 FORMAT (1X, 25I2)

6.
Adjuncts to a category

If in the analysis a case is adjuncted to a category, its identification number is read out on a separate card.

```
          A D J U N C T   A A B B . . .
Column 2  3 4 5 6 7 8 9 10 11 12 13
```

AA: identification number of an adjuncted case
BB: identification number of another adjuncted case
and so on
Machine format: 194 FORMAT (9H, ADJUNCT, 25I2)

7.
Category pattern

The response alternatives to the items defining each category are output. A column is allocated to each item that defines the cases, using the same format as the input data. A 9 is punched in the columns of the items that are not included in the category; for the items that are included, the column corresponding to the item contains the number of the response alternative contributing to the category pattern. As many cards as necessary to contain all the items are read out consecutively.

```
          C A T   A A       B B B . . .
Column 2  3 4 5 6 7 8 9 10 11 12 13
```

AA: category number
BBB: response alternatives to items in the category (a 9 is punched if an item does not form part of the category pattern)
Machine format: 951 FORMAT (1X, 4HCAT, I2, 3X, 70I1)

If an extra case is included in the run, cards describing the items in each category pattern to which it has the same response alternatives are read out in this same format.

Once all the punched output for a level of classification within a run has been performed, subroutine OUTPC is called to produce a printed table of the percentile comparisons of each case (and the extra case, if included) to each category at that level of classification. The table has the following format:

	Category 1	Category 2	. . .
Case 1	AA	BB	
Case 2			
⋮			
Extra case			

AA: percentile comparison of the individual case with the category pattern (number of item agreements between the case and the category/ number of items in the category)
BB: same as AA for the next category pattern

Subroutine Definitions

INPTR
Reads in information for calculating the correction factors; reads the number of runs to be done, the parameters for each run, and the data for each run.

FACTOR
Calculates the probabilistic correction factors used in the corrected agreement scores. These correction factors are determined by the structure of the data base and are calculated from a list of the number of response alternatives for each item in the codebook.

SCORE 1
Calculates the uncorrected and corrected agreement scores for each possible pair of cases and

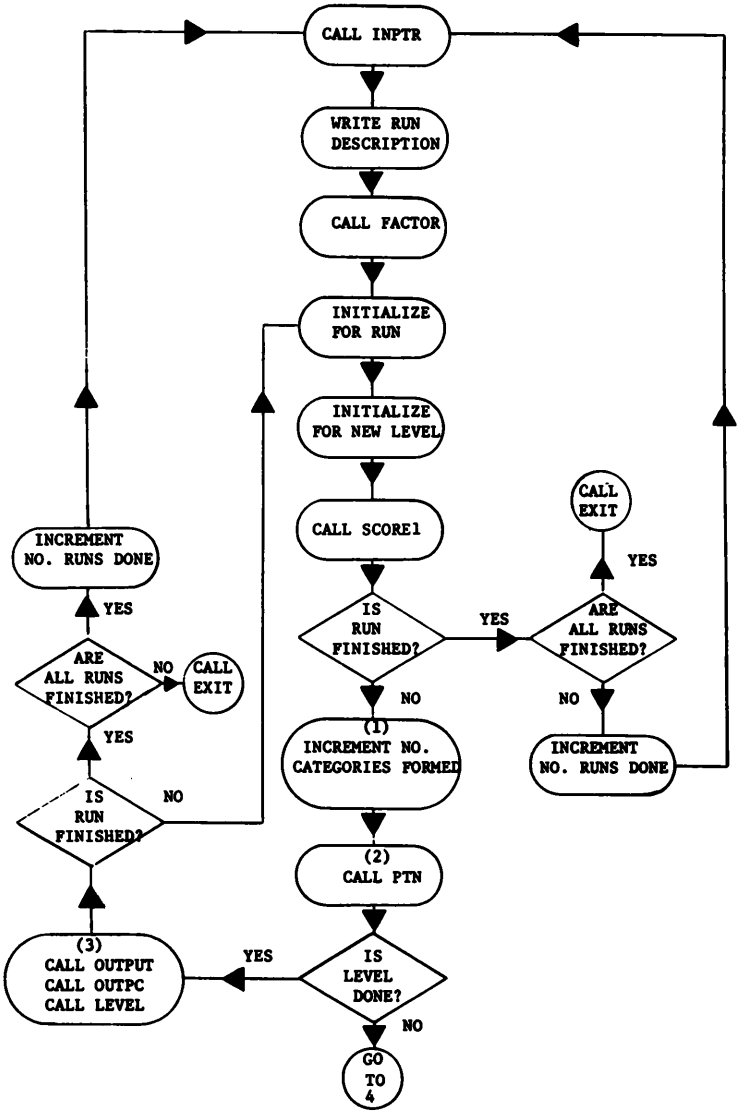
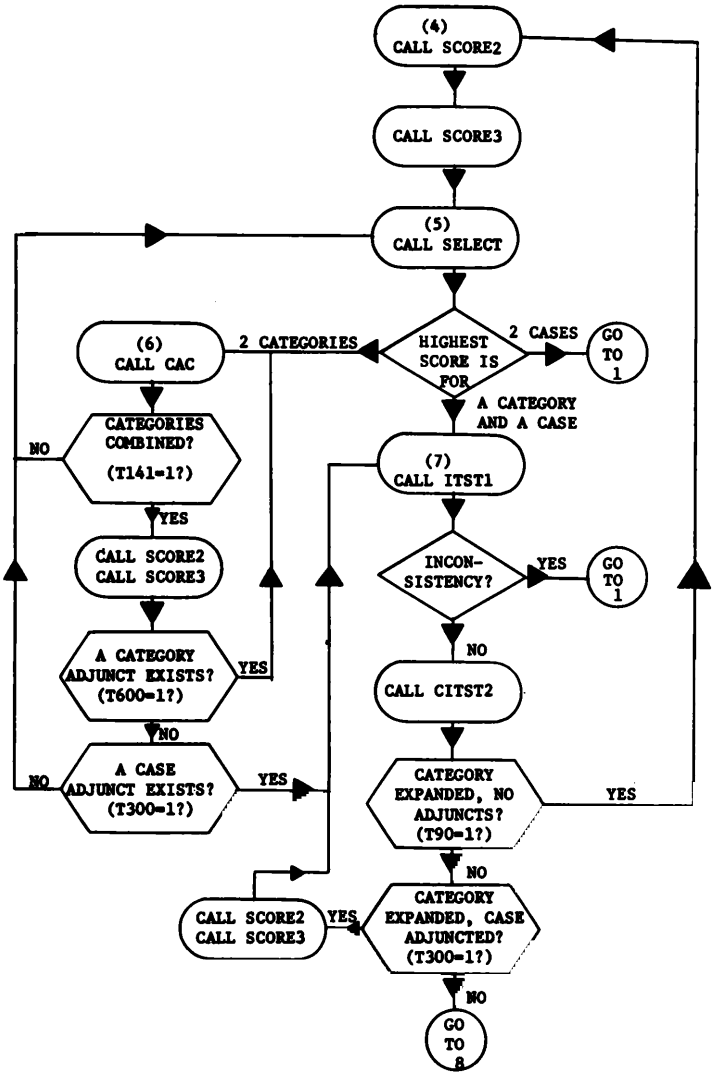
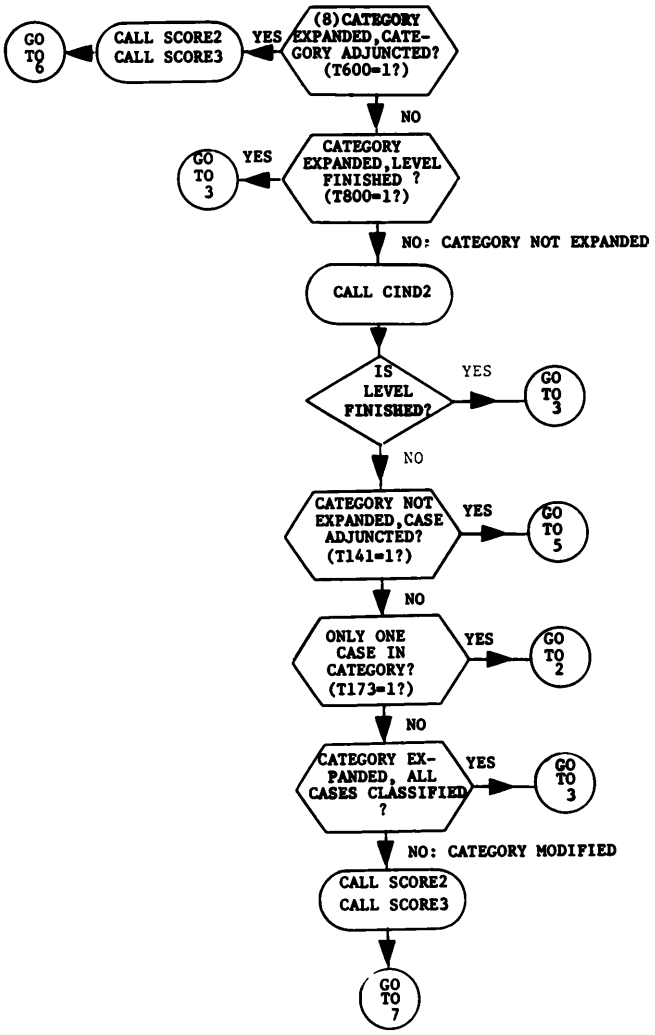


Figure 1.1
Flowchart for Main Program


(4)
CALL SCORE2
CALL SCORE3
(5)
CALL SELECT
HIGHEST SCORE IS FOR
2 CASES
GO TO 1
A CATEGORY AND A CASE
2 CATEGORIES
(6)
CALL CAC
CATEGORIES COMBINED? (T141=1?)
NO
YES
CALL SCORE2
CALL SCORE3
A CATEGORY ADJUNCT EXISTS? (T600=1?)
YES
NO
A CASE ADJUNCT EXISTS? (T300=1?)
NO
YES
(7)
CALL ITST1
INCON-SISTENCY?
YES
GO TO 1
NO
CALL CITST2
CATEGORY EXPANDED, NO ADJUNCTS? (T90=1?)
YES
NO
CATEGORY EXPANDED, CASE ADJUNCTED? (T300=1?)
YES
CALL SCORE2
CALL SCORE3
NO
GO TO 8


(8)CATEGORY EXPANDED,CATEGORY ADJUNCTED? (T600=1?)
YES
CALL SCORE2
CALL SCORE3
GO TO 6
NO
CATEGORY EXPANDED,LEVEL FINISHED ? (T800=1?)
YES
GO TO 3
NO: CATEGORY NOT EXPANDED
CALL CIND2
IS LEVEL FINISHED?
YES
GO TO 3
NO
CATEGORY NOT EXPANDED,CASE ADJUNCTED? (T141=1?)
YES
GO TO 5
NO
ONLY ONE CASE IN CATEGORY? (T173=1?)
YES
GO TO 2
NO
CATEGORY EXPANDED, ALL CASES CLASSIFIED ?
YES
GO TO 3
NO: CATEGORY MODIFIED
CALL SCORE2
CALL SCORE3
GO TO 7

selects the highest corrected agreement score. For compound agreement analysis it computes the scores between cases for both possible juxtapositions of the parties with respect to one another. The uncorrected scores are computed by summing the items for which two cases have precisely the same response pattern; this integer figure is then multiplied by the appropriate probabilistic correction factor to obtain the corrected score.

PTN
Forms a category pattern from two cases at any level of classification. The pattern consists of the item responses on which the two agree precisely.

SCORE 2
Computes the uncorrected and corrected agreement scores between the latest category pattern formed and all individual patterns (or cases), classified or unclassified. The uncorrected score consists of the number of items to which the category pattern and the individual pattern have the same response alternative; the corrected score is obtained by multiplying this figure by a probabilistic correction factor.

SCORE 3
Computes the corrected agreement scores between the latest category formed and all existing category patterns. The number of items for which all cases in both categories have the same response alternative is multiplied by a correction factor to obtain the corrected score.

SELECT
This routine searches through the three corrected agreement score matrices and selects the following three scores: the highest corrected score between two unclassified individual patterns; the highest corrected score between any category and an unclassified individual pattern; and the highest corrected score between two category patterns. These cases and categories are saved for use in the rest of the program.

ITST 1
This routine is called when the highest corrected agreement score (of the three determined by sub-

routine SELECT) is between a category pattern and an unclassified individual pattern. It performs the first test of consistency of classification on the category and unclassified pattern: whether the unclassified case has a higher corrected score with the category when it is actually brought into the category than it would have if it were made into a category with another unclassified case.

CITST 2
This routine is called if the first consistency test (ITST 1) is passed successfully (i.e., if it is found that it is still best to combine the unclassified individual pattern with the category). In this routine the second consistency test is performed to see if bringing the unclassified case into the category would so alter the category pattern that one of the individual cases in the category would be better classified with any other case (classified or unclassified) or with any other category.

CIND 2
This subroutine is called when an inconsistency is found to exist in the second test of consistency (CITST 2), namely, when it has been determined that some case in the category pattern would have a higher corrected agreement score with a case outside the category or with another category if the unclassified pattern were made a part of this category. This routine determines whether the unclassified case or the inconsistent case would now be better classified in the category, using the uncorrected agreement scores of each with the category to determine the best fit.

CAC
When the highest corrected agreement score (of the three determined by subroutine SELECT) is between two categories, this routine is called. Its purpose is to determine whether the two categories can be combined without causing an inconsistency of classification.

OUTPUT
This subroutine is used when all the individual cases have been classified at a level of classification. It produces in printed and punched card form the cases in each category, the category patterns,

and, if the extra case option has been specified, the items for which the extra case and the category have the same response alternatives.

OUTPC
At each level of classification this routine produces the percentile comparison of each individual pattern with each category pattern formed. If the option for an extra case is included, the percentile fit of this case with each category pattern is also produced.

LEVEL
This subroutine is called after the output has been performed at each level of classification. It makes the necessary adjustments, such as redefining each category and adjunct as an individual case, for classification at the next hierarchical level of the agreement analysis.

Variable Definitions

ANQST
The real (as opposed to integer) name for the number of items in any given agreement analysis run.

BGCCAT
The current highest corrected agreement score between two categories as determined by subroutine SELECT.

BGICAT
The current highest corrected agreement score between an unclassified individual pattern and a category pattern as determined by subroutine SELECT.

BIGIND
The current highest corrected agreement score between two unclassified individual patterns as determined by subroutine SELECT.

ICAUSE
An identification word containing the number of the case or category causing an inconsistency; used in subroutine CITST 2.

IEXTRA
A parameter word used to determine whether the option for an extra case is to be used. (IEXTRA=1, an extra case will be used.)

INCONS
An identification word containing the number of the case that was found to be inconsistent (subroutine CITST 2).

IORC
An identification word indicating whether the pattern causing the inconsistency is a category or an individual case (subroutine CITST 2; IORC=1, an individual case; IORC=2, a category).

ITORB1
A variable used in compound agreement analysis to indicate whether the agreement score of a case with another case or category was obtained by keeping the responses of the parties in the case in their original order or inverting them. (ITORB1=1, parties in original order; ITORB1=2, parties inverted.)

ITORB2
Same meaning as ITORB1 but used for the other individual case when the agreement score being considered is between two individual cases.

ITYPE
A parameter word indicating whether a particular run is to be a compound agreement analysis or a simple agreement analysis.

IVN
An index indicating the location of the data for the extra case in the stored data arrays (used only if the option for an extra case is chosen).

IXSPCR
A counter word containing the number of the latest category formed at any level of classification.

KD
A word containing the number of individual cases contained in a category undergoing the second test of consistency (subroutine CITST 2).

KSPCTR
The same as IXSPCR; a dummy variable containing the number of the latest category formed.

LVL
A counter word containing the number of levels of classification that have been achieved at any moment.

N
The number of individual cases in the analysis, minus one. It is used as an index in several DO loops.

NCASE1
An identification word containing the identification number of one of the cases in the pair with the highest corrected agreement score between two individual cases.

NCASE2
The other individual case of the pair having the highest corrected agreement score.

NCASES
The number of cases existing at any level of classification. At the first level, it is the number of individual cases on which the agreement analysis is being performed.

NCAT1
A word containing the identification number of one of the categories in the pair with the highest corrected agreement score between two category patterns.

NCAT2
The other category pattern of the pair having the highest corrected agreement score.

NCCPTR
A pointer used in compound agreement analysis to indicate the order of the parties in the categories having the highest corrected agreement score. (NCCPTR=1, all the parties in both categories are in their original order; NCCPTR=2, the parties in one of the categories are inverted.)

NCIPTR
A pointer word indicating the order of the parties in the case having the highest corrected agreement score with any category. (NCIPTR=1, the

parties in the case are in their original order; NCIPTR=2, the parties are inverted.)

NCSCSE
A constant for each run, containing at any time the number of cases originally submitted to the analysis.

NCSCTR
A counter containing the number of individual cases that have at any moment been classified at the current level of classification.

NHOLES
A word indicating how many slots in the array containing the categories have been filled.

NNCAT
An identification word containing the number of the category pattern with which an individual case has its highest corrected agreement score.

NNCSE
An identification word containing the number of the case with which a category has its highest corrected agreement score.

NPTR
A pointer used in compound agreement analysis to indicate whether the highest agreement score between two individual cases was obtained with all parties upright or with the parties in one case inverted. (NPTR=1, all parties upright; NPTR=2, parties in one case inverted.)

NQST
An input parameter for each run indicating the number of items in terms of which the cases are defined.

NRNCTR
A counter word containing the number of separate agreement analysis runs that have been completed in the current set.

NRUNS
A parameter indicating the total number of separate agreement analysis runs to be performed in the set.

NSPCTR
A counter word containing the number of categories currently formed at a given level of classification.

One-Dimensional Arrays

A = case number (set dimension equal to maximum number of cases to be considered)
B = item number (set dimension equal to maximum number of items to be considered)

DTBLK(50)
Contains the number of items having each possible number of response alternatives listed in DTBLN (50); also used by subroutine FACTOR to calculate correction factors.

DTBLN(50)
A dummy table listing the different numbers of possible response alternatives among all the items; this information is used by subroutine FACTOR to calculate correction factors.

ICOMNT(20)
Twenty four-character words representing a comment read in and printed out for each agreement analysis run.

ICTAG(A)
An array containing a tag for each category that is formed to indicate which correction factor should be used when calculating corrected agreement scores with that category.

IDCS(A)
An identification array containing the original identification number of each case submitted to the agreement analysis.

INADJ(A)
An array containing a location for each case, at any level, to indicate whether it is currently an adjunct of a category and, if it is, to show the number of the category to which it is adjuncted.

INADR(A)
Used in compound agreement analysis to indicate the order of the parties in any case that is adjuncted to a category. If contents are 1, parties

are in their original order; if contents are 2, parties are inverted.

INCSE(A)
Used in the second test of consistency for the identification numbers of the individual cases in the category formed.

INDUM(A)
A dummy array used in subroutine LEVEL for identification numbers of individual cases in each category formed.

IQTBL(B)
Contains the number of response alternatives for each item considered; this information is used in calculating the correction factors.

IRLCSE(A)
A working array used in subroutine OUTPUT for identification numbers of the individual cases in each category.

ITAG(A)
Contains a tag for each case to indicate the correction factor to be used when computing the corrected agreement score between this case and another case or category.

KATAJ1(A)
Contains a location for each category formed to indicate whether the category is adjuncted to another category.

KODAJ1(A)
Used in compound agreement analysis to indicate, for each category that has a case as an adjunct, the order of the parties in the case. It contains a 1 if the parties in the adjuncted case are in their original order, a 2 if they are inverted.

KODAJ2(A)
Used in compound agreement analysis to indicate the order of the parties in the category that is adjuncted to another category. It contains a 1 if the parties in the adjuncted category are in their original order, a 2 if they are inverted.

NIDCAT(A)
For each category formed at any level of classification, it contains the number of individual cases included in that category.

NUM(A)
Contains a series of integers, from 1 to the number of cases included in the agreement analysis.

NUMIND(A)
Contains the number of original, individual cases included in each category pattern at any level.

NXBBB(B)
If the option for an extra case is specified, this array contains the items for which the extra case has the same response alternative as a given category derived at any level of classification.

NXTTT(B)
Used in compound agreement analysis, it performs the same function as NXBBB(B), but the parties in the extra case are inverted before being compared with the categories.

TBLK(50)
Contains the number of items having each of the number of response alternatives listed in TBLN(50). This information is put into DTBLK(50).

TBLN(50)
A table containing the different numbers of possible response alternatives to all the items under consideration. This information is put into DTBLN(50) to calculate the correction factors.

VHOKY(A)
If the option for an extra case is chosen, this array contains the percentile comparison of that extra case with the categories formed at any level of classification.

Two-Dimensional Arrays

DFCTR(A, 50)
A buffer array containing the correction factors established for each case by subroutine FACTOR.

FCTR(A, 50)
An array containing the final version of the correction factors to be used for each case.

IBUFR(A, A)
A buffer array used by subroutine OUTPUT to determine the original case names in each category at the higher levels of classification.

IDPY(A, 2)
Contains the identification numbers of the parties in each case; used in compound agreement analysis where each case consists of two parties.

IORDER(A, A)
For compound agreement analysis, it contains the order of the original parties in each category formed at higher levels of classification.

ISPPAR(A, A)
Used by subroutine OUTPUT, this array contains the original case numbers in each category at the higher levels of classification. As each level is completed, the cases in each category at that level are translated into the original case numbers and saved in this array.

ISVBOT(A, B)
A storage array containing a permanent copy of the input data for one of the parties to all the cases submitted to a run.

ISVTOP(A, B)
A storage array containing a permanent copy of the input data for the other party to each case submitted to the run.

ITPATB(1, B)
A working array used to contain the dummy pattern formed in the second test of consistency (subroutines CITST 2 and CIND 2).

ITPATT(1, B)
A working array used to contain the other half of the dummy pattern formed in the second test of consistency.

NDATAB(A, B)
The main data array containing the data for one of the parties to each case analyzed in any given run.

NDATAT(A, B)
Same as NDATAB(A, B) for the other party.

NORDER(A/2, A)
The first dimension identifies the category number; and, in compound agreement analysis, the array contains the order of the parties in each case in a given category. If the contents are 1, the parties in the corresponding case are in their original order; if the contents are 2, the parties are inverted.

NSPPAR(A/2, A)
The first dimension identifies the category number; the array contains the cases that have been placed in each category formed at any level of classification.

NSPATB(A/2, B)
The first dimension identifies the category number; the array contains part of the category pattern of each category formed.

NSPATT(A/2, B)
Contains the other part of the category pattern of each category formed.

PRCENT(A, A/2)
At any given level of classification, contains the percentile comparison of each of the original cases with each of the categories formed at that level.

RSCR1T(A, A)
Contains the raw agreement scores between every possible pair of individual cases. In compound agreement analysis it contains the scores computed with the parties in each case in their original order.

RSCR1B(A, A)
Contains the raw agreement scores between every possible pair of individual cases, with the parties of the second case inverted.

RSCR2B(A, A)
Contains the raw agreement scores between each case and each category formed at any given level of classification. In compound agreement analysis the parties in the case involved are inverted.

RSCR2T(A, A)
Contains the raw agreement scores between each case and each category formed at a given level, with the parties in the case in their original order.

SCR1B(A, A)
Contains the corrected agreement scores between each possible pair of cases at any given level of classification, with the parties of the second case inverted.

SCR1T(A, A)
Contains the corrected agreement scores between each possible pair of cases at any level, with the parties to both cases in their original order.

SCR2B(A, A)
Contains the corrected agreement scores between each case and each category formed at any given level, with the parties in the case in inverted order.

SCR2T(A, A)
Contains the corrected agreement scores between each case and each category formed at any level, with the parties to the case in their original order.

SCR3B(A, A)
Contains the corrected agreement scores between each pair of categories formed at any given level of classification. In compound agreement analysis the parties of the cases in one of the categories are in inverted order.

SCR3T(A, A)
Contains the corrected agreement scores between each pair of categories at any level, with the parties of the cases in each category in the original order in which they entered the categories.

Program Listing

Main Program

```
C
C
C
C
C        VARIABLES IN COMMON
C
      COMMON ANOST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCONS,IOPC
      COMMON ITORB1,ITORB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      COMMON N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHOLES,NCSCTR,NCIPTR
      COMMON NNCAT,NNCSE,NPTR,NSPCTR,NOST

         ONE DIMENSIONAL ARRAYS

      COMMON DTBLK(50),DTBLN(50),ICOMNT(20),ICTAG(25),IDCS(25)
      COMMON INADJ(25),INADR(25),INCSE(25),INDUM(25),IOST(50)
      COMMON IOTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      COMMON KODAJ1(25),KODAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      COMMON NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHOKY(50)
C
C        TWO DIMENSIONAL ARRAYS
C
      COMMON DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      COMMON IORDER(25,25),ISPPAR(25,25),ISVBOT(25,300),ISVTOP(25,300)
      COMMON ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      COMMON NORDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      COMMON PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      COMMON RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      COMMON SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      NRNCTR=0
C
C        INPUT OF DATA
C
1     CALL INPTR(NRUNS,NRNCTR)
C
C         WRITE OUT RUN DESCRIPTION
      WRITE(6,981)
981   FORMAT(//,40X,22HAGREEMENT ANALYSIS RUN,//)
      WRITE(6,982)(ICOMNT(IZ),IZ=1,20)
982   FORMAT(/,20A4,//)
      NRNCTR=NRNCTR+1
C
C        SUBROUTINE TO CALCULATE CORRECTION FACTORS
C
      CALL FACTOR
C
C         INITIALIZATION FOR BEGINNING OF EACH RUN
C
      ZERO=0.
      IZERO=0
      ONE=1.
      IONE=1
      ITWO=2
      LVL=IONE
      T57=ZERO
      TTCII=ZERO
      T90=ZERO
      T300=ZERO
      T600=ZERO
      T800=ZERO
      T141=ZERO
      TT141=ZERO
      TT73=ZERO
      TT800=ZERO
      ANONEG=-ANOST
      NINE=9
      DO 3 IA7=1,NCASES
      NUMIND(IA7)=1
3     CONTINUE
C
C        INITIALIZATION FOR EACH LEVEL WITHIN A RUN
C
5     N=NCASES-1
      IEND=IZERO
      NCSCTR=IZERO
      NSPCTR=IZERO
      NHOLES=IONE
      DO 9 IY=1,NCSCSE
      ICTAG(IY)=IZERO
      NIDCAT(IY)=IZERO
      INADJ(IY)=IZERO
      INADR(IY)=IZERO
      KATAJ1(IY)=IZERO
      KODAJ1(IY)=IZERO
      KATAJ2(IY)=IZERO
      KODAJ2(IY)=IZERO
      DO 8 IX=1,NCSCSE
      SCR1T(IX,IY)=ANONEG
      SCR1B(IX,IY)=ANONEG
      SCR2T(IX,IY)=ANONEG
      SCR2B(IX,IY)=ANONEG
      SCR3T(IX,IY)=ANONEG
      SCR3B(IX,IY)=ANONEG
      RSCR1T(IX,IY)=ZERO
```

```
      RSCR1B(IX,IY)=ZERØ
      RSCR2T(IX,IY)=ZERØ
      RSCR2B(IX,IY)=ZERØ
8     CØNTINUE
9     CØNTINUE
      KIT=(NCSCSF-11/2
      DØ 160 JAG=1,KIT
      DØ 150 JØG=1,NCSCSF
      NSPPAR(JAG,JØG)=IZERØ
      NØRDER(JAG,JØG)=IZERØ
150   CØNTINUE
160   CØNTINUE
C
C                    BEGIN WØRKING PRØGRAM
C
C
C        CØMPUTE AGREEMENT SCØRES BETWEEN ALL PØSSIBLE PAIRS
C              ØF CASES AND SELECT HIGHEST SCØRE TØ FØRM FIRST SPECIES
C
18    CALL SCØRE1(IEND)
      IF(IEND-1)53,56,56
56    IF(NCSCSF-NIDCAT(1))53,53,57
C
C        SEE IF ALL RUNS HAVE BEEN DØNE--IF SØ, CALL EXIT
C
53    IF(NRUNS-NRNCTR)1,24,1
24    CALL EXIT
C
C        INCREMENT NUMBER ØF CASES CLASSIFIED AT THIS LEVEL BY 2
C
57    NCSCTR=NCSCTR+2

C        INCREMENT NUMBER ØF SPECIES FØRMED AT THIS LEVEL BY 1
C
      NSPCTR=NSPCTR+1
      IXSPCR=NSPCTR
      NHØLES=NSPCTR
73    CALL PTN
C
C        IF ALL CASES HAVE BEEN CLASSIFIED AT THIS LEVEL, ØUTPUT
C
      IF(NCASES-NCSCTR)800,800,79
79    KSPCTR=NSPCTR
90    CALL SCØRE2
91    IF(NSPCTR-1)141,141,105
105   CALL SCØRE3
C
C        SELECT THE HIGHEST SCØRES BETWEEN INDIV. CASES,
C                 CASES AND CATEGØRIES, AND TWØ CATEGØRIES
C
141   CALL SELECT
      IF(BIGIND-ANONEG)280,275,280
275   IF(BGICAT-ANONEG)280,276,280
276   IF(BGCCAT-ANONEG)280,800,280
280   IF(BIGIND-BGICAT)284,282,282
282   IF(BIGIND-BGCCAT)287,285,285
284   IF(BGICAT-BGCCAT)287,286,286
C
C        CURRENT LARGEST SCØRE IS BETWEEN TWØ INDIVIDUAL CASES
C
285   BGICAT=-ANØST
      BGCCAT=-ANØST
      WRITE(6,920)
920   FØRMAT(33HØBIGGEST SCØRE BETWEEN IND. CASES,//)
      GØ TØ 57
C
C        CURRENT LARGEST SCØRE IS BETWEEN AN INDIV. CASE AND A CATEGØRY
C
286   BIGIND=-ANØST
      BGCCAT=-ANØST
      WRITE(6,921)
921   FØRMAT(40HØBIGGEST SCØRE BETWEEN IND. CASE AND CAT,//)
      GØ TØ 300
C
C        CURRENT LARGEST SCØRE IS BETWEEN TWØ CATEGØRIES
C
287   BIGIND=-ANØST
      BGICAT=-ANØST
      WRITE(6,922)
922   FØRMAT(21HØBIG SCØRE IS CAT-CAT,//)
      GØ TØ 600
C
C     FIRST INCØNSISTENCY TEST
C
300   CALL ITST1(T57,TTCI1)
      IF(T57-ØNE)500,57,500
C
C        SECØND INCØNSISTENCY TEST
C
500   CALL CITST2(T90,T300,T600,TB00,TTCI1)
      IF(T90-1.)305,90,305
305   IF(T300-1.)306,120,306
120   KSPCTR=NNCAT
```

```
      CALL SCØRE2
      CALL SCØRE3
      GØ TØ 300
306   IF(T600-1.)503,124,503
124   KSPCTR=NNCAT
      CALL SCØRE2
      CALL SCØRE3
      GØ TØ 600
503   IF(T800-1.)504,800,504
C
C        AN INCØNSISTENCY EXISTS.
C        CHECK WHETHER INCØNSISTENT PTN ØR PTN BEING CLASSIFIED GØES BETTER
C        IN CATEGØRY
C
504   CALL CIND2(TT141,TT73,TT800)
      IF(NCASES-NCSCTR)800,800,510
510   IF(TT141-1.)351,141,351
351   IF(TT73-1.)352,128,352
128   CALL PTN
      IF(NCASES-NCSCTR)800,800,90
352   IF(TT800-1.)353,800,353
353   CALL SCØRE2
      IF(NSPCTR-1)13,13,12
12    CALL SCØRE3
13    GØ TØ 300
C
C        HIGHEST SCØRE WAS BETWEEN TWØ CATEGØRIES---
C        ATTEMPT TØ CØMBINE TWØ CATEGØRIES INTØ ØNE
C
600   CALL CAC(TT41,T300,T600)
      IF(T141-1.)675,141,675
675   CALL SCØRE2
      IF(NSPCTR-1)678,678,676
676   CALL SCØRE3
678   IF(T300-1)680,300,680
680   IF(T600-1)141,600,141
C
C        ØUTPUT ØF THE CATEGØRIES AND THEIR PATTERNS
C
800   CALL ØUTPUT(NRUNS,NRNCTR)
C
C        ØUTPUT ØF THE PERCENTAGE FITS ØF EACH CASE INTØ EACH CATEGØRY
C
      CALL ØUTPC
C
C        ADJUSTMENTS IN PREPARATIØN FØR NEXT LEVEL ØF CLASSIFICATIØN
C
      CALL LEVEL
C
C        SEE IF RUN IS FINISHED--WHEN ØNLY ØNE CASE EXISTS AT
C            CURRENT LEVEL
C
32    IF(NCASES-1)33,33,5
33    IF(NRUNS-NRNCTR)35,24,35
35    GØ TØ 1
      END
```

Subroutine INPTR

```
      SUBRØUTINE INPTR(NRUNS,NRNCTR)
C
C
C        READING ØF INPUT DATA FØR EACH RUN
C
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANØST,BGCCAT,BGICAT,BIGIND,ICAUSE,IFXTRA,INCØNS,IØPC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NØST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INAJR(25),INCSE(25),INDUM(25),IØST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBR(300),NXTTT(300),TBLK(50),TBLN(50),VHØRY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IPUFR(25,25),IDDX(25,2)
      CØMMØN IJRDER(25,25),ISPPAR(25,25),ISVPAT(25,300),ISVTAR(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IF(NRNCTR-1)60,1,1

         READ IN NUMBER ØF RUNS TØ BE MADE
```

```
C
60    READ(5,980)NRUNS,NQST
980   FORMAT(I1,1X,I3)
C
C        READ IN NUMBER OF RESPONSE ALTERNATIVES FOR EACH QUESTION
C
      READ(5,904)(IQTBL(KT),KT=1,NQST)
C
C        READ IN COMMENT CARD  --  ANY FORMAT
C
1     READ(5,905)(ICOMNT(KQ),KQ=1,20)
C
C        READ IN LIST OF PARAMATERS FOR THIS RUN
C
      READ(5,903)ITYPE,NCASES,NQST,IEXTRA
      NCSCSE=NCASES
      ANQST=NQST
      IVN=NCSCSE+1
C
C                        READ IN DATA
C
C        CHECK FOR SIMPLE OR COMPOUND AGREEMENT ANALYSIS---
C           IF SIMPLE,JUST READ IN TOP
C
      IF(ITYPE-1)30,28,30
C
C        SIMPLE VERSION -- READ IN TOP, MAP TOP INTO BOTTOM
C
30    DO 40 NEX=1,NCASES
      READ(5,902)IDCS(NEX),(NDATAT(NEX,J07),J07=1,NQST)
      DO 50 IEX=1,NQST
      NDATAB(NEX,IEX)=NDATAT(NEX,IEX)
50    CONTINUE
40    CONTINUE
      GO TO 29
C
C        COMPOUND VERSION TO BE USED
C
28    DO 16 NZ=1,NCASES
      READ(5,902)IDCS(NZ),(NDATAT(NZ,NX),NX=1,NQST)
      READ(5,901)(NDATAB(NZ,NR),NR=1,NQST)
16    CONTINUE
C
C        SEE WHETHER AN EXTRA PARTY IS TO BE READ IN
C
29    IF(IEXTRA-1)21,20,21
C
C        READ IN DATA ON THE EXTRA PARTY
C
20    READ(5,902)IDCS(IVN),(ISVTOP(IVN,KP),KP=1,NQST)
      READ(5,901)(ISVBOT(IVN,KQ),KQ=1,NQST)
C
C        STORE DATA READ IN INTO A PERMANENT ARRAY
C        THIS DATA IS NEEDED TO CALCULATE PERCENTAGE FIT OF
C        ALL CASES INTO ALL CATEGORIES AT EACH LEVEL OF CLASSIFICATION
C
21    DO 710 IREP=1,NCASES
      DO 705 JOREP=1,NQST
      ISVTOP(IREP,JOREP)=NDATAT(IREP,JOREP)
      ISVBOT(IREP,JOREP)=NDATAB(IREP,JOREP)
705   CONTINUE
710   CONTINUE
C
C        INPUT FORMAT STATEMENTS
C
901   FORMAT(10X,7011)
902   FORMAT(I2,8X,7011,/,1(10X,7011))
903   FORMAT(I1,1X,I2,1X,I3,1X,I1)
904   FORMAT(10X,I2)
905   FORMAT(20A4)
      RETURN
      END
```

Subroutine FACTOR

```
      SUBROUTINE FACTOR
C
C        CALCULATION OF THE PROBABILISTIC CORRECTION FACTORS NEEDED
C                        FOR THIS RUN
C
C
C        VARIABLES IN COMMON
C
      COMMON ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCONS,IORC
      COMMON ITORB1,ITORB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      COMMON N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHOLES,NCSCTR,NCIPTR
      COMMON NNCAT,NNCSE,NPTR,NSPCTR,NQST

         ONE DIMENSIONAL ARRAYS

      COMMON DTPLK(50),DTPLN(50),ICOMNT(20),ICTAG(25),IDCS(25)
      COMMON INADJ(25),INADP(25),INCSE(25),INDUM(25),IQST(50)
      COMMON IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
```

```
      COMMON KODAJ1(25),KODAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      COMMON NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHOKY(50)
C
C        TWO DIMENSIONAL ARRAYS
C
      COMMON DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      COMMON IORDER(25,25),ISPPAR(25,25),ISVBOT(25,300),ISVTOP(25,300)
      COMMON ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      COMMON NORDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      COMMON PRCENT(25,12),RSCR1T(25,25),RSCR1P(25,25),RSCR2T(25,25)
      COMMON RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      COMMON SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IZERO=0
      NFCTR=2*NCASES
C
C        INITIALIZE N AND K TABLES
C
      DO 200 NP=1,50
      TBLN(NP)=0.
      TBLK(NP)=0.
200   CONTINUE
C
C        CREATE AN N AND K TABLE FROM THE NUMBER OF RESPONSE ALTERNA-
C                FOR EACH QUESTION
C
      DO 40 KA=1,NOST
      NKO=IOTBL(KA)
      TBLK(NKO)=NKO
      TBLN(NKO)=TBLN(NKO)+1.
40    CONTINUE
C
C     PUT N-K TABLE INTO DUMMY TABLE
C
      DO 90 IG=1,NCASES
      DO 15 IF=1,50
      DTBLN(IF)=TBLN(IF)
      DTBLK(IE)=TBLK(IF)
15    CONTINUE
C
C        CALCULATE THE N-K TABLE FOR EACH RUN
C        BEFORE COMPUTING CORRECTION FACTORS FOR EACH RUN,
C        ELIMINATE QUESTIONS ANSWERED AS UNKNOWN (9) OR AS
C                        NOT APPLICABLE (8)
C
      NOCTR=IZERO
      DO 50 IH=1,NOST
      IF(NDATAT(IG,IH)-9)18,17,18
18    IF(NDATAB(IG,IH)-9)19,17,19
19    IF(NDATAT(IG,IH)-8)50,20,50
20    IF(NDATAB(IG,IH)-8)50,17,50
C
C     SUBTRACT APPROPRIATE QUESTIONS FROM DUMMY TABLE OF N-K
C
17    NOK=IOTBL(IH)
      NOCTR=NOCTR+1
      DTBLN(NOK)=DTBLN(NOK)-1.
50    CONTINUE
      IOST(IG)=NOST-NOCTR
C
C     COMPUTE CORRECTION FACTORS WITH N AND K IN DUMMY TABLES
C
      DO 60 IJ=1,NFCTR
      DUM1=0.
      DUM2=0.
      DO 55 IK=1,50
      IF(DTBLN(IK)-0.)55,55,51
51    DUM1=DUM1+DTBLN(IK)/(DTBLK(IK)**IJ)
      DUM2=DUM2+(DTBLN(IK)*((DTBLK(IK)**IJ)-1.))/DTBLK(IK)**IJ
55    CONTINUE
      DFCTR(IG,IJ)=DUM1/DUM2
      IF(DFCTR(IG,IJ)-0.0)775,775,60
775   DFCTR(IG,IJ)=.0000001
60    CONTINUE
90    CONTINUE
C
C        DETERMINE TAGS FOR CORRECTION FACTORS SO AS TO ARRANGE
C                FACTORS FROM SMALLEST NO. OF Q TO LARGEST
C
      NINE=999
      DO 38 KX=1,NCASES
      ISM=MINF
      DO 35 K7=1,NCASES
      IF(IOST(K7)-ISM)32,35,35
32    ISM=IOST(K7)
      NSV=K7
35    CONTINUE
      ITAG(NSV)=KX
      IOST(NSV)=NINE
38    CONTINUE
C
C        ASSIGN CORRECTION FACTORS TO PROPER CASES
C
```

```
      DØ 5 MMZ=1,NCASES
      JACK=ITAG(MM7)
      DØ 210 MZA=1,NFCTR
      FCTR(JACK,MZA)=DFCTR(MM7,MZA)
210   CØNTINUE
5     CØNTINUE
      RETURN
      END
```

Subroutine SCORE1

```
      SUBRØUTINE SCØRE1(IEND)
C
C        CALCULATIØN ØF CØRRECTED AND UNCØRRECTED AGREEMENT SCØRES
C        BETWEEN EACH PØSSIBLE PAIR ØF INDIVIDUAL CASES
C        AND SELECTIØN ØF HIGHEST CØRRECTED SCØRE
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NMØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IØTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KLDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12 300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      ITWØ=2
      IØNE=1
      IZERØ=0
      ØNE=1.
      ZERØ=0.
      ACTR1=ZERØ
      ACTR2=ZERØ
      IEND=IZERØ
      DBIG1=-ANQST
      DBIG2=-ANQST
18    DØ 50 I=1,N
      J=I+1
      DØ 40 L=J,NCASES
      DØ 30 M=1,NQST
      IF(NDATAT(I,M)-9)60,30,60
60    IF(NDATAB(I,M)-9)61,30,61
61    IF(NDATAT(I,M)-8)19,62,19
62    IF(NDATAB(I,M)-8)19,30,19
19    IF(NDATAT(I,M)-NDATAT(L,M))24,20,24
20    IF(NDATAB(I,M)-NDATAB(L,M))24,21,24
21    ACTR1=ACTR1+1.
24    IF(NDATAT(I,M)-NDATAB(L,M))30,25,30
25    IF(NDATAB(I,M)-NDATAT(L,M))30,26,30
26    ACTR2=ACTR2+1.
30    CØNTINUE
      RSCR1T(I,L)=ACTR1
      RSCR1B(I,L)=ACTR2
      RSCR1T(L,I)=ACTR1
      RSCR1B(L,I)=ACTR2
34    NPAQ=NUMIND(I)+NUMIND(L)-1
C
C        CHØØSE CØRRECTIØN FACTØR ØF CASE HAVING SMALLEST
C                NUMBER ØF QUESTIØNS
C
      IF(ITAG(I)-ITAG(L))64,64,65
64    NT1=ITAG(I)
      GØ TØ 67
65    NT1=ITAG(L)
67    SCR1T(I,L)=ACTR1-(ANQST-ACTR1)*FCTR(NT1,NPAQ)
      SCR1B(I,L)=ACTR2-(ANQST-ACTR2)*FCTR(NT1,NPAQ)
      SCR1T(L,I)=SCR1T(I,L)
      SCR1B(L,I)=SCR1B(I,L)
      ACTR1=ZERØ
      ACTR2=ZERØ
      IF(SCR1T(I,L)-DBIG1)38,37,37
37    DBIG1=SCR1T(I,L)
      NCSE11=I
      NCSE12=L
38    IF(SCR1B(I,L)-DBIG2)40,39,39
39    DBIG2=SCR1B(I,L)
      NCSE21=I
      NCSE22=L
```

```
      IF(RSCR1T(I,L)-ØNE)51,52,52
51    IF(RSCR1B(I,L)-ØNE)40,52,52
52    IEND=10,C
40    CØNTINUE
50    CØNTINUE
55    IF(DBIG2-DBIG1)56,56,54
54    NPTR=ITWC
      NCASE1=NCSE21
      NCASE2=NCSE22
      ITØRB1=IØNE
      ITØRB2=ITWØ
      T3PSC=DBIG1
      RAWTØP=RSCR1T(NCASE1,NCASE2)
      GØ TØ 57
56    NPTR=IØNE
      NCASE1=NCSE11
      NCASE2=NCSE12
      ITØRB1=IØNE
      ITØRB2=IØNE
      TØPSC=DBIG1
      RAWTØP=RSCR1T(NCASE1,NCASE2)
57    WRITE(6,944)TØPSC,IDCS(NCASE1),IDCS(NCASE2)
      WRITE(6,945)RAWTØP
944   FØRMAT(10X,27HHIGHEST CØRRLCTED SCØRL IS ,F8.3,14HBETWEEN CASES ,
     112,5H AND ,I2)
945   FØRMAT(14X,23HRAW AGREEMENT SCØRL IS ,F8.3,//)
      RETURN
      END
```

Subroutine PTN

```
      SUBRØUTINE PTN
C
C
C        FØRMATIØN ØF A CATEGØRY PATTERN FRØM TWØ INDIVIDUAL CASES
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST

         ØNE DIMENSIØNAL ARRAYS

      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBØB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IØNE=1
      NINE=9
      IF(IXSPCR-NNCAT)5,6,5
5     DØ 720 ICA=1,NHØLES
      IF(NIDCAT(ICA)-IØNE)719,720,720
719   IXSPCR=ICA
720   CØNTINUE
6     NHØLES=NSPCTR
73    NIDCAT(IXSPCR)=NUMIND(NCASE1)+NUMIND(NCASE2)
      WRITE(6,914)IXSPCR,NIDCAT(IXSPCR)
914   FØRMAT(10H CAT. NØ. ,I2,5H HAS ,I2,12H INDIV. PTNS,//)
45    IF(NPTR-1)66,60,66
60    DØ 65 IA=1,NQST
      IF(NDATAT(NCASE1,IA)-9)61,64,61
61    IF(NDATAB(NCASE1,IA)-9)81,64,81
81    IF(NDATAT(NCASE1,IA)-8)80,82,80
82    IF(NDATAB(NCASE1,IA)-8)80,64,80
80    IF(NDATAT(NCASE1,IA)-NDATAT(NCASE2,IA))64,62,64
62    IF(NDATAB(NCASE1,IA)-NDATAB(NCASE2,IA))64,63,64
63    NSPATT(IXSPCR,IA)=NDATAT(NCASE1,IA)
      NSPATB(IXSPCR,IA)=NDATAB(NCASE1,IA)
      GØ TØ 65
64    NSPATT(IXSPCR,IA)=NINE
      NSPATB(IXSPCR,IA)=NINE
65    CØNTINUE
      NØRDER(IXSPCR,NCASE1)=ITØRB1
      NØRDER(IXSPCR,NCASE2)=ITØRB2
      GØ TØ 77
66    DØ 76 IC=1,NQST
      IF(NDATAT(NCASE1,IC)-9)67,75,67
67    IF(NDATAB(NCASE1,IC)-9)86,75,86
```

```
86    IF(NDATAT(NCASE1,IC)-8)85,88,85
88    IF(NDATAB(NCASE1,IC)-8)85,75,85
85    IF(NDATAT(NCASE1,IC)-NDATAB(NCASE2,IC))75,68,75
68    IF(NDATAB(NCASE1,IC)-NDATAT(NCASE2,IC))75,69,75
69    NSPATT(IXSPCR,IC)=NDATAT(NCASE1,IC)
      NSPATB(IXSPCR,IC)=NDATAB(NCASE1,IC)
      GØ TØ 76
75    NSPATT(IXSPCR,IC)=NINE
      NSPATB(IXSPCR,IC)=NINE
76    CØNTINUE
      NØRDER(IXSPCR,NCASE1)=ITØRB1
      NØRDER(IXSPCR,NCASE2)=ITØRB2
77    NSPPAR(IXSPCR,NCASE1)=NCASE1
      NSPPAR(IXSPCR,NCASE2)=NCASE2
      WRITE(6,947)IXSPCR,NCASE1,NCASE2
947   FØRMAT(1ØX,9HCATEGØRY ,I2,16H CØNTAINS CASES ,I2,5H AND ,I2,//)
      WRITE(6,946)
946   FØRMAT(2ØX,36HTHE CATEGØRY PATTERN IS AS FØLLØWS--,///)
      IF(ITYPE-2)97,99,99
97    WRITE(6,905)(NSPATT(IXSPCR,LP),LP=1,NQST)
      GØ TØ 92
99    WRITE(6,905)(NSPATT(IXSPCR,LZZ),LZZ=1,NQST)
      WRITE(6,905)(NSPATB(IXSPCR,LZQ),LZQ=1,NQST)
905   FØRMAT(1ØX,7ØI1)
C
C     DETERMINE TAG FØR NEW CATEGØRY FØRMED
C
92    IF(ITAG(NCASE1)-ITAG(NCASE2))9Ø,9Ø,93
9Ø    ICTAG(IXSPCR)=ITAG(NCASE1)
      GØ TØ 98
93    ICTAG(IXSPCR)=ITAG(NCASE2)
98    RETURN
      END
```

Subroutine SCORE2

```
      SUBRØUTINE SCØRE2
C
C
C        CALCULATIØN ØF CØRRECTED AGREEMENT SCØRES BETWEEN EACH
C        CATEGØRY AND EACH INDIVIDUAL CASE
C
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST

         ØNE DIMENSIØNAL ARRAYS

      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ1(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IØTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IZERØ=0
      ZERØ=0.
      IØNE=1
      NINE=9
      BCTR1=ZERØ
      BCTR2=ZERØ
      NPAQ2=IZERØ
      NQ2=NIDCAT(KSPCTR)
90    DØ 100 JB=1,NCASES
      DØ 87 JE=1,NQST
      IF(NSPATT(KSPCTR,JE)-NINE)93,87,93
93    IF(NDATAB(JB,JE)-9)94,87,94
94    IF(NDATAT(JB,JE)-8)110,95,110
95    IF(NDATAB(JB,JE)-8)110,87,110
110   IF(NDATAT(JB,JE)-NINE)81,87,81
81    IF(NSPATT(KSPCTR,JE)-NDATAT(JB,JE))84,82,84
82    IF(NSPATB(KSPCTR,JE)-NDATAB(JB,JE))84,83,84
83    BCTR1=BCTR1+1.
84    IF(NSPATT(KSPCTR,JE)-NDATAB(JB,JE))87,85,87
85    IF(NSPATB(KSPCTR,JE)-NDATAT(JB,JE))87,86,87
86    BCTR2=BCTR2+1.
87    CØNTINUE
      NP2=NUMIND(JB)
      NPAQ2=NP2+NQ2-IØNE
```

```
      RSCR2T(KSPCTR,JB)=BCTR1
      RSCR2B(KSPCTR,JB)=BCTR2
      IF(ICTAG(KSPCTR)-ITAG(JB))99,99,96
99    ICS2=ICTAG(KSPCTR)
      GØ TØ 92
96    ICS2=ITAG(JB)
92    SCR2T(KSPCTR,JB)=BCTR1-(ANQST-BCTR1)*FCTR(ICS2,NPAQ2)
      SCR2B(KSPCTR,JB)=BCTR2-(ANQST-BCTR2)*FCTR(ICS2,NPAQ2)
      BCTR1=ZERØ
      BCTR2=ZERØ
100   CØNTINUE
      RETURN
      END
```

Subroutine SCORE3

```
      SUBRØUTINE SCØRE3
C
C
C        CALCULATIØN ØF CØRRECTED AGREEMENT SCØRES BETWEEN ALL
C        PØSSIBLE PAIRS ØF CATEGØRIES
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(75),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(3C0),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      ZERØ=0.
      NINE=9
      CCTR1=ZERØ
      CCTR2=ZERØ
      KSPCTR=NSPCTR
105   NP3=NIDCAT(KSPCTR)
106   DØ 140 IG=1,NHØLES
      IF(NIDCAT(IG)-1)118,107,107
107   IF(KSPCTR-IG)110,118,110
110   DØ 125 IE=1,NQST
      IF(NSPATT(IG,IE)-NINE)176,125,176
176   IF(NSPATT(IG,IE)-NSPATT(KSPCTR,IE))113,111,113
111   IF(NSPATB(IG,IE)-NSPATB(KSPCTR,IE))113,112,113
112   CCTR1=CCTR1+1.
113   IF(NSPATT(IG,IE)-NSPATB(KSPCTR,IE))125,114,125
114   IF(NSPATB(IG,IE)-NSPATT(KSPCTR,IE))125,115,125
115   CCTR2=CCTR2+1.
125   CØNTINUE
      GØ TØ 128
118   SCR3T(IG,KSPCTR)=-ANQST
      SCR3B(IG,KSPCTR)=-ANQST
      GØ TØ 140
128   NQ3=NIDCAT(IG)
129   NPAQ3=NP3+NQ3-1
      IF(ICTAG(KSPCTR)-ICTAG(IG))138,138,139
138   NCS3=ICTAG(KSPCTR)
      GØ TØ 149
139   NCS3=ICTAG(IG)
C     SEE IF LATEST CATEGØRY IS A NEW ØNE ØR AN ØLD MØDIFIED ØNE
149   IF(NSPCTR-KSPCTR)131,130,131
C        IT IS A NEW ØNE
130   SCR3T(IG,KSPCTR)=CCTR1-(ANQST-CCTR1)*FCTR(NCS3,NPAQ3)
      SCR3B(IG,KSPCTR)=CCTR2-(ANQST-CCTR2)*FCTR(NCS3,NPAQ3)
      GØ TØ 135
131   IF(IG-KSPCTR)132,140,134
132   SCR3T(IG,KSPCTR)=CCTR1-(ANQST-CCTR1)*FCTR(NCS3,NPAQ3)
      SCR3B(IG,KSPCTR)=CCTR2-(ANQST-CCTR2)*FCTR(NCS3,NPAQ3)
      GØ TØ 135
134   SCR3T(KSPCTR,IG)=CCTR1-(ANQST-CCTR1)*FCTR(NCS3,NPAQ3)
      SCR3B(KSPCTR,IG)=CCTR2-(ANQST-CCTR2)*FCTR(NCS3,NPAQ3)
135   CCTR1=ZERØ
      CCTR2=ZERØ
140   CØNTINUE
      RETURN
      END
```

Subroutine SELECT

```
      SUBRØUTINE SELECT
C
C
C        SELECTIØN ØF HIGHEST CØRRECTED AGREEMENT SCØRE BETWEEN
C        TWØ UNCLASSIFIED CASES, BETWEEN AN UNCLASSIFIED CASE AND
C        A CATEGØRY, AND BETWEEN TWØ CATEGØRIES
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN I ,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NICAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      ZERØ=0.
      IZERØ=0
      NLTST1=IZERØ
      IØNE=1
      ITWØ=2
      NINE=9
      NLTST2=IZERØ
      BIGIND=-ANQST
      BGICAT=-ANQST
      BGCCAT=-ANQST
      AQNEG=-ANQST
      III=IZERØ
      BIG1T=-ANQST
      BIG1B=-ANQST
      DBIG2T=-ANQST
      DBIG2B=-ANQST
      DBIG3T=-ANQST
      DBIG3B=-ANQST

      SEARCH FØR HIGHEST SCØRE BETWEEN TWØ INDIVIDUAL PATTERNS

      DØ 190 IJ=1,N
      IF(INADJ(IJ)-1)145,190,190
145   DØ 150 IL=1,NHØLES
      IF(NIDCAT(IL)-1)150,126,126
126   IF(NSPPAR(IL,IJ)-IJ)150,146,150
146   NLTST1=IJ
150   CØNTINUE
      IF(NLTST1-IJ)142,189,142
142   III=IJ+1
      DØ 170 IK=III,NCASES
      IF(INADJ(IK)-1)147,170,170
147   DØ 153 IØ=1,NHØLES
      IF(NIDCAT(IØ)-1)153,58,58
58    IF(NSPPAR(IØ,IK)-IK)153,151,153
151   NLTST2=IK
153   CØNTINUE
      IF(NLTST2-IK)156,169,156
156   IF(SCR1T(IJ,IK)-BIG1T)160,158,158
158   BIG1T=SCR1T(IJ,IK)
      IND1TX=IJ
      IND1BX=IK
160   IF(SCR1B(IJ,IK)-BIG1B)170,163,163
163   BIG1B=SCR1B(IJ,IK)
      IND2TX=IJ
      IND2BX=IK
169   NLTST2=ZERØ
170   CØNTINUE
189   NLTST1=ZERØ
190   CØNTINUE
      IF(BIG1T-AQNEG)193,191,193
191   IF(BIG1B-AQNEG)193,196,193
193   IF(BIG1T-BIG1B)194,195,195
194   NPTR=ITWØ
      BIGIND=BIG1B
      NCASE1=IND2TX
      NCASE2=IND2BX
      ITØRB1=IØNE
      ITØRB2=ITWØ
      GØ TØ 199
```

```
195   NPTR=IØNE
      BIGIND=BIG1T
      NCASE1=IN_1TX
      NCASE2=INI1BX
      ITØRB1=IØNE
      ITØRB2=IØNE
      GØ TØ 199
196   BIGIND=-ANQST
199   BIG1T=-ANQST
      BIG1B=-ANQST
      WRITE(6,924)BIGIND,IDCS(NCASE1),IDCS(NCASE2)
924   FØRMAT(1ØX,51HHIGHEST CØRRECTED SCØRE FØR UNCLASSIFIED INDIVIDUAL,
     110H CASES IS ,F8.3,15H BETWEEN CASES ,I2,5H AND ,I2,/)
C
C     SEARCH FØR HIGHEST SCØRE BETWEEN AN INDIV. PTN AND A CAT. PTN
C
200   DØ 225 IR=1,NHØLES
      MATST=IZERØ
      IF(NIDCAT(IR)-1)225,201,201
201   DØ 224 ISS=1,NCASES
      IF(INADJ(ISS)-1)202,223,223
202   DØ 204 MAA=1,NHØLES
      IF(NSPPAR(MAA,ISS)-ISS)204,203,204
203   MATST=ISS
204   CØNTINUE
      IF(MATST-ISS)205,223,205
205   IF(SCR2T(IR,ISS)-DBIG2T)208,208,207
207   DBIG2T=SCR2T(IR,ISS)
      IDCAT1=IR
      IDPAT1=ISS
208   IF(SCR2B(IR,ISS)-DBIG2B)224,224,213
213   DBIG2B=SCR2B(IR,ISS)
      IDCAT2=IR
      IDPAT2=ISS
      MATST=IZERØ
      GØ TØ 224
223   BGICAT=-ANQST
224   CØNTINUE
225   CØNTINUE
      IF(DBIG2T-AQNEG)233,235,233
235   IF(DBIG2B-AQNEG)233,310,233
233   IF(DBIG2T-DBIG2B)236,234,234
310   BGICAT=-ANQST
      GØ TØ 237
234   BGICAT=DBIG2T
      NNCAT=IDCAT1
      NNCSE=IDPAT1
      NCIPTR=IØNE
      GØ TØ 237
236   BGICAT=DBIG2B
      NNCAT=IDCAT2
      NNCSE=IDPAT2
      NCIPTR=ITWØ
237   DBIG2T=-ANQST
      DBIG2B=-ANQST
      WRITE(6,925)BGICAT,IDCS(NNCSE),NNCAT
925   FØRMAT(1ØX,51HHIGHEST CØRRECTED SCØRE FØR A CATEGØRY AND AN INDIV,
     115H IDUAL CASE ,I2,14H AND CATEGØRY ,I2,/)
240   IF(NSPCTP-1)260,260,241
C
C     SELECT HIGHEST VALID SCØRE BETWEEN TWØ CATEGØRIES
C
241   DØ 255 JF=1,N
      IF(JF-NCASES)446,255,446
446   IF(NIDCAT(JF)-1)255,243,243
243   IF(KATAJ2(JF)-1)246,255,255
246   JJJ=JF+1
      DØ 250 JG=JJJ,NCASES
      IF(JF-JG)445,250,250
445   IF(NIDCAT(JG)-1)250,242,242
242   IF(KATAJ2(JG)-1)247,250,250
247   IF(SCR3T(JF,JG)-DBIG3T)245,244,244
244   DBIG3T=SCR3T(JF,JG)
      ICAT11=JF
      ICAT12=JG
245   IF(SCR3B(JF,JG)-DBIG3B)250,250,248
248   DBIG3B=SCR3B(JF,JG)
      ICAT21=JF
      ICAT22=JG
250   CØNTINUE
255   CØNTINUE
256   IF(DBIG3T-AQNEG)263,257,263
257   IF(DBIG3B-AQNEG)263,260,263
260   BGCCAT=-ANQST
      GØ TØ 270
263   IF(DBIG3T-DBIG3B)268,265,265
265   BGCCAT=DBIG3T
      NCAT1=ICAT11
      NCAT2=ICAT12
      NCCPTR=IØNE
      GØ TØ 270
268   BGCCAT=DBIG3B
      NCAT1=ICAT21
```

```
      NCAT2=ICAT22
      NCCPTR=ITWØ
270   DBIG3T=-ANQST
      BDIG3B=-ANQST
      WRITE(6,953)BGCCAT,NCAT1,NCAT2
953   FØRMAT(10),50HH1GHEST CØRRECTED SCØRE BETWEEN TWØ CATEGØRIES IS ,
     1F8.3,18H BETWEEN CATEGØRY ,I2,13H AND CATEGØRY,1X,I2,//)
      RETURN
      END
```

Subroutine ITST1

```
      SUBRØUTINE ITST1(T57,TTCI1)
C
C
C                          FIRST INCØNSISTENCY TEST
C
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN LTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN K2DAJ1(25),K0DAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IORDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
C
C        FØRM A TENTATIVE CATEGØRY CØNSISTING ØF C AND U, THEN SEE
C        IF U HAS A HIGHER CØRRECTED AGREEMENT SCØRE WITH CU ØR WITH SØME
C        UNCLASSIFIED INDIVIDUAL PATTERN
C
7     IØNE=1
      ITWØ=2
      ØNE=1.
      ZERØ=0.
      IZERØ=0
      NINE=9
      QNEG=-ANQST
      ITST=IZERØ
      TSTU=ZERØ
      TBGØ=-ANQST
      TBSV=-ANQST
      TBGI11=-ANQST
      TBGCS1=-ANQST
      TBIG11=-ANQST
      TBIG1T=-ANQST
      T57=ZERØ
C
C     CØMPUTE CØRRECTIØN FACTØR,U-CU
C
      NPP=NUMIND(NNCSE)
      NQQ=NIDCAT(NNCAT)
      NPQT1=NPP+NPP+NQQ-1
C
C     IS INDIV PTN INVERTED ØR UPRIGHT
C
      IF(ITAG(NNCSE)-ICTAG(NNCAT))130,130,133
130   ICS5=ITAG(NNCSE)
      GØ TØ 306
133   ICS5=ICTAG(NNCAT)
306   IF(NCIPTR-1)308,308,310
C
C     CØMPUTE CØRRECTED SCØRE
C
308   TTCI1=RSCR2T(NNCAT,NNCSE)-(ANQST-RSCR2T(NNCAT,NNCSE))*FCTR(ICS5,
     1NPQT1)
      GØ TØ 311
310   TTCI1=RSCR2B(NNCAT,NNCSE)-(ANQST-RSCR2B(NNCAT,NNCSE))*FCTR(ICS5,
     1NPQT1)
311   ITST=IZERØ
C
C     CHECK FØR ALL CASES CLASSIFIED EXCEPT THIS ØNE (NNCSE)
C
      IF(NCSCTR-N)312,380,312
C
C     CHECK SCØRE ØF NNCSE WITH CAT AGAINST NNCSE WITH ALL UNCLASS.
```

```
C     CASES TØ SEE IF ANY A HAS A SCØRE GREATER THAN U-CU
C
312   DØ 330 JK=1,NCASES
      IF(ITST-1)211,209,260
260   TSTU=ØNE
9     FØRMAT(12H U-U1 LØØPED,//)
      WRITE(6,9)
      GØ TØ 330
209   IF(TBSV-SCR1T(NNCSE,JK))330,330,210
210   IF(TBSV-SCR1B(NNCSE,JK))330,330,211
211   IF(NNCSE-JK)313,330,313
313   IF(INAD.(JK)-1)314,330,330
314   DØ 319 JL=1,NCASES
      IF(NSPPAR(JL,JK)-JK)319,317,319
317   IZLAS1=JK
319   CØNTINUE
      IF(IZLAS1-JK)321,329,321
321   IF(SCR1T(NNCSE,JK)-TBIG11)327,327,325
325   TBIG11=SCR1T(NNCSE,JK)
      ITØRD1=IØNE
      NTSCS1=JK
327   IF(SCR1B(NNCSE,JK)-TBIG11)330,328,328
328   TBIG11=SCR1B(NNCSE,JK)
      NTSCS1=JK
      ITØRD1=ITWØ
329   IZLAS1=IZERØ
330   CØNTINUE
      IF(TSTU-1)10,380,380
10    IF(TBIG11-ONEG)335,380,335
335   IPQT1=NUMIND(NNCSE)+NUMIND(NTSCS1)+NUMIND(NNCSE)-1
      IF(ITAG(NNCSE)-ITAG(NTSCS1))150,150,155
150   JCS6=ITAG(NNCSE)
      GØ TØ 336
155   JCS6=ITAG(NTSCS1)
336   IF(ITØRD1-1)337,337,338
337   MIJ=NNCSE
      IJZ=NTSCS1
      TTII1=RSCR1T(MIJ,IJZ)-(ANQST-RSCR1T(MIJ,IJZ))*FCTR(JCS6,IPQT1)
C     TTII1 IS C SCØRE ØF U(NNCSE) WITH U1
      GØ TØ 340
338   MIJ=NNCSE
      IJZ=NTSCS1
      TTII1=RSCR1B(MIJ,IJZ)-(ANQST-RSCR1B(MIJ,IJZ))*FCTR(JCS6,IPQT1)
C
C     CØMPARE U-UU1 TØ U-CU
C
340   IF(TTCI1-TTII1)332,380,380
332   TBGØ=-ANQST
C
C     U-UU1 IS HIGHER( CHECK U1 WITH ALL ØTHER PATTERNS
C
      DØ 350 JØ=1,N
      IF(NNCSE-JØ)341,350,341
341   IF(NTSCS1-JØ)342,350,342
342   IF(SCR1T(.TSCS1,JØ)-TBGØ)344,344,343
343   TBGØ=SCR1T(NTSCS1,JØ)
344   IF(SCR1B(NTSCS1,JØ)-TBGØ)350,350,346
346   TBGØ=SCR1B(NTSCS1,JØ)
350   CØNTINUE
      IF(TTII1-TBGØ)363,356,356
C     U WITH U1 GREATER THAN UUUU( CHECK U-UU1 WITH U1CI
356   TBGCS1=-ANQST
      DØ 361 JP=1,NHØLES
      IF(NNCAT-JP)358,361,358
358   IF(SCR2T(JP,NTSCS1)-TBGCS1)359,357,357
357   TBGCS1=SCR2T(JP,NTSCS1)
359   IF(SCR2B(JP,NTSCS1)-TBGCS1)361,361,360
360   TBGCS1=SCR2B(JP,NTSCS1)
361   CØNTINUE
      IF(TTII1-TBGCS1)560,370,370
560   TBSV=TTII1
      TBIG11=-ANQST
      ITST=ITST+1
      TBGCS1=-ANQST
      GØ TØ 312
363   ITST=ITST+1
255   TBSV=TTII1
      TBIG11=-ANQST
      GØ TØ 312
370   IF(NCIPTR-ITØRD1)373,372,371
372   IF(ITØRD1-1)402,402,404
402   NPTR=1
      NCASE1=NNCSE
      NCASE2=NTSCS1
      ITØRB1=IØNE
      ITØRB2=IØNE
      T57=ØNE
      GØ TØ 815
371   NCASE2=NNCSE
      NCASE1=NTSCS1
      NPTR=2
      ITØRB1=IØNE
```

```
      ITØRB2=ITWØ
      T57=ØNE
      GØ TØ 815
404   NPTR=1
      NCASE1=NNCSE
      NCASE2=NTSCS1
      ITØRB1=ITWØ
      ITØRB2=ITWØ
      ITØRB2=IØNE
      T57=ØNE
      GØ TØ 815
373   NCASE2=NTSCS1
      NCASE1=NNCSE
      NPTR=2
      ITØRB1=ITWØ
      ITØRB2=IØNE
      T57=ØNE
      GØ TØ 815
380   T57=ZERØ
815   WRITE(6,157)
157   FØRMAT(20X,34HFIRST INCØNSISTENCY TEST COMPLETED,//)
      RETURN
      END
```

Subroutine CITST2

```
      SUBRØUTINE CITST2(T90,T300,T600,T800,TTCI1)
C
C        SECØND INCØNSISTENCY TEST
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANGST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN NAJCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN AFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IØNE=1
      ØNE=1.
      ZERØ=0.
      IZERØ=0
      NINE=9
      QNEG=-ANQST
      ITST=IZERØ
      ICAUSE=IZERØ
      INCØNS=IZERØ
      T90=ZERØ
      T300=ZERØ
      T600=ZERØ
      T300=ZERØ
C
C        SEE IF ANY CASE IN THE EXPANDED CATEGØRY HAS A
C        HIGHER CØRRECTED AGREEMENT SCØRE WITH ANY ØTHER CASE
C        THAN THE CASE TØ BE CLASSIFIED HAS WITH THE EXPANDED
C        CATEGØRY INTØ WHICH IT IS BEING CLASSIFIED
C
380   ANSCNS=ZERØ
      DØ 599 JS=1,NCASES
      IF(NSPPAR(NNCAT,JS)-1)599,396,396
396   ICL=NSPPAR(NNCAT,JS)
6     DØ 406 JT=1,NCASES
      IF(NSPPAR(NNCAT,JT)-JT)397,406,397
397   IF(NNCSE-JT)8,406,8
8     IF(INADJ(JT)-NNCAT)9,406,9
9     IF(TTCI1-SCR1T(ICL,JT))401,503,503
401   IF(ANSCNS-SCR1T(ICL,JT))402,503,503
402   ANSCNS=SCR1T(ICL,JT)
      INCØNS=ICL
      ICAUSE=JT
      IØRC=IØNE
503   IF(TTCI1-SCR1B(ICL,JT))504,406,406
504   IF(ANSCNS-SCR1B(ICL,JT))505,406,406
505   ANSCNS=SCR1B(ICL,JT)
      ICAUSE=JT
      INCØNS=ICL
```

```
      IØRC=IØNE
406   CØNTINUE
      DØ 413 JU=1,NHØLES
      IF(NIDCAT(JU)-IØNE)413,393,393
393   IF(JU-NNCAT)407,413,407
407   IF(TTCI1-SCR2T(JU,ICL))409,516,516
409   IF(ANSCNS-SCR2T(JU,ICL))410,516,516
410   ANSCNS=SCR2T(JU,ICL)
      INCØNS=ICL
      ICAUSE=JU
      IØRC=ITWØ
516   IF(TTCI1-SCR2B(JU,ICL))517,413,413
517   IF(ANSCNS-SCR2B(JU,ICL))518,413,413
518   ANSCNS=SCR2B(JU,ICL)
      INCØNS=JS
      IØRC=ITWØ
      ICAUSE=JU
413   CØNTINUE
599   CØNTINUE
      IF(ANSCNS-1.)415,603,603
415   NCSCTR=NCSCTR+1
      WRITE(6,956)
956   FØRMAT(20X,25H NØ INCØNSISTENCY EXISTS.)
418   NIDCAT(NNCAT)=NIDCAT(NNCAT)+NUMIND(NNCSE)
419   IF(NCIPTR-1)426,420,426
420   DØ 425 KA=1,NQST
      IF(NSPATT(NNCAT,KA)-NINE)421,424,421
421   IF(NSPATT(NNCAT,KA)-NDATAT(NNCSE,KA))424,422,424
422   IF(NSPATB(NNCAT,KA)-NDATAB(NNCSE,KA))424,425,424
424   NSPATT(NNCAT,KA)=NINE
      NSPATB(NNCAT,KA)=NINE
425   CØNTINUF
      NØRDER(NNCAT,NNCSE)=IØNE
      GØ TØ 437
426   DØ 436 KB=1,NQST
      IF(NSPATT(NNCAT,KB)-NINE)427,435,427
427   IF(NSPATT(NNCAT,KB)-NDATAB(NNCSE,KB))435,428,435
428   IF(NSPATB(NNCAT,KB)-NDATAT(NNCSE,KB))435,436,435
435   NSPATT(NNCAT,KB)=NINE
      NSPATB(NNCAT,KB)=NINE
436   CØNTINUE
      NØRDER(NNCAT,NNCSE)=ITWØ
437   NSPPAR(NNCAT,NNCSE)=NNCSE
      WRITE(6,957)NNCAT,IDCS(NNCSE),NIDCAT(NNCAT)
957   FØRMAT(10X,10HCATEGØRY ,I2,29H IS EXPANDED TØ INCLUDE CASE ,I2,//,
     110X,22HCATEGØRY NØW CØNTAINS ,I2,5HCASES.//)
      IF(ITYPE-1)320,325,325
320   WRITE(6,958)(NSPATT(NNCAT,MAØ),MAØ=1,NQST)
      GØ TØ 326
325   WRITE(6,958)(NSPATT(NNCAT,MA),MA=1,NQST)
      WRITE(6,958)(NSPATB(NNCAT,NA),NA=1,NQST)
958   FØRMAT(10X,7011)
326   IF(ICTAG(NNCAT)-ITAG(NNCSE))110,110,101
101   ICTAG(NNCAT)=ITAG(NNCSE)
110   IF(NCASES-NCSCTR)439,814,439
814   T800=ØNE
      GØ TØ 815
439   IF(KATAJ1(NNCAT)-1)440,448,448
440   IF(KATAJ2(NNCAT)-1)442,454,454
442   KSPCTR=NNCAT
      T90=ØNE
      GØ TØ 815
448   NNCSE=KATAJ1(NNCAT)
      IF(KØDAJ1(NNCSE)-1)450,449,450
449   NCIPTR=IØNE
      GØ TØ 451
450   NCIPTR=ITWØ
451   INADJ(NNCSE)=IZERØ
      KATAJ1(NNCAT)=IZERØ
      DØ 446 KKC=1,NHØLES
      IF(INADJ(KKC)-NNCAT)446,444,446
444   KATAJ1(NNCAT)=KKC
446   CØNTINUE
      T300=ØNE
      GØ TØ 815
454   NCAT1=NNCAT
      NCAT2=KATAJ2(NNCAT)
      NCCPTR=KØDAJ2(NNCAT)
      KATAJ2(NCAT1)=IZERØ
      KATAJ2(NCAT2)=IZERØ
      DØ 459 KKD=1,NCASES
      IF(KATAJ2(KKD)-NNCAT)459,456,459
456   KATAJ2(NNCAT)=KKD
459   CØNTINUE
      T600=ØNE
      GØ TØ 815
603   WRITE(6,962)INCØNS,ICAUSE
962   FØRMAT(29H AN INCØNS EXISTS BECAUSE ØF ,I2,2X,I2)
      KD=IZERØ
      ANSCNS=IZERØ
      DØ 465 KC=1,NCASES
      IF(NSPPAR(NNCAT,KC)-IZERØ)461,465,461
```

```
461   IF(NSPPAR(NNCAT,KC)-INCONS)462,465,462
462   KD=KD+1
      INCSE(KD)=KC
465   CONTINUE
      IQTST=IZERO
      IN1=INCSE(1)
      IF(KD-1)560,560,466
C
C        FORM A DUMMY PATTERN OF ALL CASES IN CATEGORY EXCEPT
C        INCONSISTENT ONE
C
560   DO 565 IBAG=1,NQST
      ITPATT(1,IBAG)=NDATAT(IN1,IBAG)
      ITPATB(1,IBAG)=NDATAB(IN1,IBAG)
565   CONTINUE
      GO TO 815
466   DO 485 KF=1,NQST
      IQTST=IZERO
      DO 480 KE=2,KD
      IN2=INCSE(KE)
      IF(IQTST-1)578,480,578
578   IF(NDATAT(IN1,KF)-NINE)468,474,468
468   IF(NDATAT(IN2,KF)-NINE)469,474,469
469   IF(NDATAB(IN1,KF)-9)122,474,122
122   IF(NDATAB(IN2,KF)-9)123,474,123
123   IF(NDATAT(IN1,KF)-8)120,124,120
124   IF(NDATAB(IN1,KF)-8)120,474,120
120   IF(NORDER(NNCAT,IN2)-1)487,470,487
470   IF(NORDER(NNCAT,IN1)-1)477,473,477
487   IF(NORDER(NNCAT,IN1)-1)473,477,473
473   IF(NDATAT(IN1,KF)-NDATAT(IN2,KF))474,471,474
471   IF(NDATAB(IN1,KF)-NDATAB(IN2,KF))474,480,474
474   IQTST=IONE
      ITPATT(1,KF)=NINE
      ITPATB(1,KF)=NINE
      GO TO 480
477   IF(NDATAT(IN1,KF)-NDATAB(KE,KF))478,479,478
478   IF(NDATAB(IN1,KF)-NDATAT(KE,KF))480,479,480
479   IQTST=IONE
      ITPATT(1,KF)=NINE
      ITPATB(1,KF)=NINE
480   CONTINUE
      IF(IQTST-1)482,485,483
483   ITPATT(1,KF)=NDATAT(IN1,KF)
      ITPATB(1,KF)=NDATAB(IN1,KF)
485   CONTINUE
815   ITST=IZERO
      RETURN
      END
```

Subroutine CIND2

```
      SUBROUTINE CIND2(TT141,TT73,TT800)
C
C        FINISH SECOND INCONSISTENCY TEST
C
C
C
C        VARIABLES IN COMMON
C
      COMMON ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCONS,IORC
      COMMON ITORB1,ITORB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      COMMON N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHOLES,NCSCTR,NCIPTR
      COMMON NNCAT,NNCSE,NPTR,NSPCTR,NQST

         ONE DIMENSIONAL ARRAYS

      COMMON DTBLK(50),DTBLN(50),ICOMNT(20),ICTAG(25),IDCS(25)
      COMMON IJADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      COMMON IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      COMMON KODAJ1(25),KODAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      COMMON NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHOKY(50)

         TWO DIMENSIONAL ARRAYS

      COMMON DF(TR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      COMMON IORDER(25,25),ISPPAR(25,25),ISVBOT(25,300),ISVTOP(25,300)
      COMMON ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      COMMON NORDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      COMMON PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      COMMON RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      COMMON SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IZERO=0
      ZERO=0.
      NINE=9
      ONE=1.
      IONE=1
      TWO=2.
      ITWO=2
      TT800=ZERO
      TT141=ZERO
      TT73=ZERO
      RSUT=ZERO
      RSUB=ZERO
```

```
      RSISB=ZERØ
      RSIST=ZERØ
      IXSPCR=NNCAT
      KSPCTR=NNCAT
      IF(KD-1)200,200,210
200   IØTA=INCSE(1)
      IF(IØTA-0)221,210,221
221   RSUT=RSCR1T(NNCSE,IØTA)
      RSUB=RSCR1B(NNCSE,IØTA)
      RSIST=RSCR1T(INCØNS,IØTA)
      RSISB=RSCR1B(INCØNS,IØTA)
      IF(RSUT-RSUB)211,212,212
211   BU=RSUB
      GØ TØ 216
212   BU=RSUT
216   IF(RSIST-RSISB)217,218,218
217   BINCNS=RSISB
      GØ TØ 220
218   BINCNS=RSIST
      GØ TØ 220
210   DØ 495 KG=1,NQST
C
C     CØMPUTE RAS ØF U WITH T
C
      IF(ITPATT(1,KG)-NINE)529,495,529
529   IF(NDATAT(NNCSE,KG)-NINE)488,495,488
488   IF(NDATAT(NNCSE,KG)-ITPATT(1,KG))491,489,491
489   IF(NDATAB(NNCSE,KG)-ITPATB(1,KG))491,492,491
492   RSUT=RSUT+ØNE
491   IF(NDATAT(NNCSE,KG)-ITPATB(1,KG))495,493,495
493   IF(NDATAB(NNCSE,KG)-ITPATT(1,KG))495,494,495
494   RSUB=RSUB+1.
495   CØNTINUE
C
C     CØMPUTE RAS ØF P WITH T
C
      DØ 505 KH=1,NQST
      IF(ITPATT(1,KH)-NINE)497,505,497
497   IF(NDATAT(INCØNS,KH)-NINE)498,505,498
498   IF(NDATAT(INCØNS,KH)-ITPATT(1,KH))501,499,501
499   IF(NDATAB(INCØNS,KH)-ITPATB(1,KH))501,500,501
500   RSIST=RSIST+ØNE
501   IF(NDATAT(INCØNS,KH)-ITPATB(1,KH))505,503,505
503   IF(NDATAB(INCØNS,KH)-ITPATT(1,KH))505,504,505
504   RSISB=RSISB+1.
505   CØNTINUE
      IF(RSIST-RSISB)508,508,509
508   BINCNS=RSISB
      IØRBX1=ITWØ
      GØ TØ 510
509   BINCNS=RSIST
C
C     IS P WITH T(BINCNS) ØR U WITH T(BU) HIGHER
C
      IØRBX1=IØNE
510   IF(RSUT-RSUB)511,511,512
511   BU=RSUB
      IØRBY2=ITWØ
      GØ TØ 514
512   BU=RSUT
      IØRBY2=IØNE
514   IADX=1
220   IF(BINCNS-BU)520,515,515
C     CASE IN C IS HIGHER(  MAKE U AN ADJUNCT ØF C
515   INADJ(NNCSE)=NNCAT
      INADR(NNCSE)=IØRBY2
516   KATAJ1(NNCAT)=NNCSE
      KØDAJ1(NNCAT)=IØRBY2
      NCSCTR=NCSCTR+IØNE
      IF(NCASES-NCSCTR)325,800,325
325   TT141=ØNE
      WRITE(6,4)IDCS(NNCSE),NNCAT
4     FØRMAT(6H CASE ,I2,27H IS MADE AN ADJUNCT ØF CAT ,I2)
      GØ TØ 350
800   TT800=ØNE
      GØ TØ 350
C     UNCLASS CASE IS HIGHER, REMØVE INCØNSISTENT PTN FRØM C, RELEASE
C     ALL ADJUNCTS
520   KATAJ1(NNCAT)=IZERØ
      KØDAJ1(NNCAT)=IZERØ
      KATAJ2(NNCAT)=IZERØ
      KØDAJ2(NNCAT)=IZERØ
      DØ 525 KJ=1,NCASES
      IF(INADJ(KJ)-NNCAT)523,521,523
521   INADJ(KJ)=IZERØ
      NCSCTR=NCSCTR-1
523   IF(KATAJ2(KJ)-NNCAT)525,518,525
518   KATAJ2(KJ)=IZERØ
525   CØNTINUE
      NSPPAR(NNCAT,INCØNS)=IZERØ
      NØRDER(NNCAT,INCØNS)=IZERØ
      NIDCAT(NNCAT)=NIDCAT(NNCAT)-NUMIND(INCØNS)
      NCSCTR=NCSCTR-1
```

```
      IF(IØRC-1)545,527,545
C
C     WAS ITEM CAUSING INCØNS AN INDIV PTN ØR A CATEGØRY PTN
C
527   KTST=IZERØ
      DØ 530 KL=1,NHØLES
      IF(NSPPAR(KL,ICAUSE)-1)530,528,528
528   KTST=IØNE
      INCAT=KL
530   CØNTINUE
      IF(KTST-1)531,535,531
531   DØ 534 KM=1,NCASES
      IF(KATAJ1(KM)-ICAUSE)534,532,534
532   KATAJ1(KM)=IZERØ
      NCSCTR=NCSCTR-1
534   CØNTINUE
      INADJ(ICAUSE)=IZERØ
      GØ TØ 545
C
C     INDIV PAT CAUSING INCØNSISTENCY WAS CLASSIFIEC IN INCAT
C
535   DØ 537 KN=1,NCASES
      IF(INADJ(KN)-INCAT)537,536,537
536   INADJ(KN)=IZERØ
      NCSCTR=NCSCTR-1
537   CØNTINUE
      KATAJ1(INCAT)=IZERØ
      JDUMXY=KATAJ2(INCAT)
      KATAJ2(INCAT)=IZERØ
      KATAJ2(JDUMXY)=IZERØ
      DØ 550 KKN=1,NHØLES
      IF(KATAJ2(KKN)-INCAT)550,549,550
549   KATAJ2(KKN)=IZERØ
550   CØNTINUE
      DØ 540 KL=1,NCASES
      SCR3T(INCAT,KL)=ANØNEG
      SCR3B(INCAT,KL)=ANØNEG
      SCR2T(INCAT,KL)=ANØNEG
      SCR2B(INCAT,KL)=ANØNEG
      RSCR2T(INCAT,KL)=ZERØ
      RSCR2B(INCAT,KL)=ZERØ
      IF(NSPPAR(INCAT,KL)-1)540,538,538
538   NSPPAR(INCAT,KL)=IZERØ
      NØRDER(INCAT,KL)=IZERØ
      NCSCTR=NCSCTR-1
540   CØNTINUE
      NIDCAT(INCAT)=IZERØ
      NSPCTR=NSPCTR-1
C     IF CAT CAUSED INCØNSISTENCY, DØ NØTHING
545   IØRC=IZERØ
C     SEE IF MØRE THAN ØNE INDIV PAT IN T
      IF(KD-1)566,546,566
C     ØNLY 1 PAT IN T, FØRM A CATEGØRY ØF T AND U
546   IØDZZ=NØRDER(NNCAT,KD)
      I1ZZ=INCSE(KD)
      IXSPCR=NNCAT
      NCSCTR=NCSCTR+1
      NIDCAT(NNCAT)=IZERØ
      NSPPAR(NNCAT,I1ZZ)=IZERØ
      IF(NCIPTR-IØDZZ)558,559,563
558   NPTR=ITWØ
      ITØRB1=IØNE
      ITØRB2=ITWØ
      NCASE1=NNCSE
      NCASE2=I1ZZ
      TT73=ØNE
      GØ TØ 350
559   IF(NCIPTR-1)560,560,561
560   NPTR=IØNE
      ITØRB1=IØNE
      ITØRB2=IØNE
      TT73=ØNE
      GØ TØ 350
561   ITØRB1=ITWØ
      ITØRB2=ITWØ
      NPTR=IØNE
      TT73=ØNE
      GØ TØ 350
563   NPTR=ITWØ
      NCASE2=NNCSE
      NCASE1=I1ZZ
      ITØRB1=IØNE
      ITØRB2=ITWØ
      TT73=ØNE
      GØ TØ 350
566   KD=IZERØ
      DØ 574 KQ=1,NQST
      NSPATT(NNCAT,KQ)=ITPATT(1,KQ)
      NSPATB(NNCAT,KQ)=ITPATB(1,KQ)
574   CØNTINUE
      KSPCTR=NNCAT
      IF(ICTAG(NNCAT)-ITAG(INCØNS))350,600,600
600   ISMTAG=99
```

```
      DØ 620 IDAD=1,NCASES
      IF(NSPPAR(NNCAT,IDAD)-IDAD)620,610,610
610   IF(ITAG(IDAD)-ISMTAG)611,620,620
611   ISMTAG=ITAG(IDAD)
620   CØNTINUE
      ICTAG(NNCAT)=ISMTAG
350   RETURN
      END
```

Subroutine CAC

```
      SUBRØUTINE CAC(T141,T300,T600)
C
C
C        CØMBINATIØN ØF TWØ CATEGØRIES AND THEIR PATTERNS
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANQST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN IT_RB1,IT_RB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NQST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IQST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATE(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IZERØ=0
      ZERØ=0.
      NINE=9
      ØNE=1.
      IØNE=1
601   T141=ZERØ
      T600=ZERØ
      T300=ZERØ
      T91=ZERØ
      RCTTR=ZERØ
C
C        FØRM DUMMY CATEGØRY PATTERN FRØM TWØ CATEGØRY PATTERNS
C
      DØ 622 LA=1,NQST
      IF(NSPATT(NCAT1,LA)-NINE)603,623,603
603   IF(NSPATB(NCAT1,LA)-NINE)605,623,605
605   IF(NCCPTR-1)606,606,609
606   IF(NSPATT(NCAT1,LA)-NSPATT(NCAT2,LA))623,607,623
607   IF(NSPATB(NCAT1,LA)-NSPATB(NCAT2,LA))623,612,623
609   IF(NSPATT(NCAT1,LA)-NSPATB(NCAT2,LA))623,610,623
610   IF(NSPATB(NCAT1,LA)-NSPATT(NCAT2,LA))623,612,623
612   ITPATT(1,LA)=NSPATT(NCAT1,LA)
      ITPATB(1,LA)=NSPATB(NCAT1,LA)
      RCTTR=RCTTR+ØNE
      GØ TØ 622
623   ITPATT(1,LA)=NINE
      ITPATB(1,LA)=NINE
622   CØNTINUE
C
C        CØUNT NUMBER ØF CASES IN CØMBINED CATEGØRY
C
      KDKD=IZERØ
      DØ 628 LB=1,NCASES
      IF(NSPPAR(NCAT1,LB)-LB)625,624,625
624   KDKD=KDKD+IØNE
      INCSE(KDKD)=LB
625   IF(NSPPAR(NCAT2,LB)-LB)628,626,628
626   KDKD=KDKD+IØNE
      INCSE(KDKD)=LB
628   CØNTINUE
      JINCNS=IZERØ

         CHECK FØR AN INCØNSISTENCY

      DØ 645 LC=1,KDKD
      IF(JINCNS-0)629,629,645
629   NCSP=INCSE(LC)
      NP3=NUMIND(NCSP)
      KTTPQ=NIDCAT(NCAT1)+NIDCAT(NCAT2)+NP3-1
      IF(ICTAG(NCAT1)-ICTAG(NCAT2))510,510,512
510   ICS4=ICTAG(NCAT1)
```

```
      GØ TØ 515
512   ICS4=ICTAG(NCAT2)
C
C        SCØRE ?F INDIVIDUAL PATTERN IN CATEGØRY WITH THE CØMBINED
C                          CATEGØRY
C
515   TS3=RCCTR-(ANQST-RCCTR)*FCTR(ICS4,KTTPQ)
C
C        CØMPARE SCØRE ØF EACH INDIVIDUAL PATTERN IN THE CØMBINED
C                  CATEGØRY WITH ALL UNCLASSIFIED CA  PATTERNS
C
      DØ 638 LD=1,NCASES
      IF(NSPPAR(NCAT1,LD)-LD)630,638,630
630   IF(NSPPAR(NCAT2,LD)-LD)631,638,631
631   IF(INADJ(LD)-0)690,638,690
690   IF(NCSP-LD)691,638,691
691   IF(TS3-SCR1T(NCSP,LD))635,633,633
633   IF(TS3-SCR1B(NCSP,LD))635,638,638
635   JINCNS=IØNE
638   CØNTINUE
C
C        IF JINCNS=1, AN INCØNSISTENCY EXISTS
C
      IF(JINCNS-0)639,639,645
C
C        CHECK FØR INCØNSISTENCIES WITH ØTHER CATEGØRIES
C
639   DØ 644 LE=1,NHØLES
      IF(NIDCAT(LE)-C)644,644,640
640   IF(NCAT1-LE)692,644,692
692   IF(NCAT2-LE)693,644,693
693   IF(TS3-SCR2T(LE,NCSP))641,642,642
641   JINCNS=IØNE
642   IF(TS3-SCR2B(LE,NCSP))643,644,644
643   JINCNS=IØNE
644   CØNTINUE
645   CØNTINUE
C
C        IF AN INCØNSISTENCY EXISTS, MAKE CATEGØRIES ADJUNCTS ØF
C                          EACH ØTHER
C
      IF(JINCNS-IØNE)650,647,650
647   KATAJ2(NCAT1)=NCAT2
      KATAJ2(NCAT2)=NCAT1
      KØDAJ2(NCAT1)=IØNE
      KØDAJ2(NCAT2)=NCCPTR
      T141=ØNE
      WRITE(6,901)NCAT1,NCAT2
901   FØRMAT(20X,9HCATEGØRY ,I2,14H AND CATEGØRY ,I2,
     132H ARE MADE ADJUNCTS ØF EACH ØTHER,//)
      GØ TØ 700
C
C        NØ INCØNSISTENCY EXISTS--CØMBINE THE CATEGØRIES
C
650   NIDCAT(NCAT1)=NIDCAT(NCAT1)+NIDCAT(NCAT2)
      NIDCAT(NCAT2)=IZERØ
      KSPCTR=NCAT1
      NSPCTR=NSPCTR-1
      IF(ICTAG(NCAT1)-ICTAG(NCAT2))518,518,520
520   ICTAG(NCAT1)=ICTAG(NCAT2)
518   DØ 655 LG=1,NCASES
      IF(NSPPAR(NCAT2,LG)-1)655,652,652
652   NSPPAR(NCAT1,LG)=LG
      NSPPAR(NCAT2,LG)=IZERØ
      NØRDER(NCAT1,LG)=NØRDER(NCAT2,LG)
      NØRDER(NCAT2,LG)=IZERØ
655   CØNTINUE
      DØ 660 LH=1,NQST
      NSPATT(NCAT1,LH)=ITPATT(1,LH)
      NSPATB(NCAT1,LH)=ITPATB(1,LH)
660   CØNTINUE
      WRITE(6,902)NCAT1,NCAT2,NCAT1
902   FØRMAT(20X,9HCATEGØRY ,I2,14H AND CATEGØRY ,I2,
     126H ARE CØMBINED AS CATEGØRY ,I2,//)
      WRITE(6,904)
904   FØRMAT(20X,26HCATEGØRY PATTERN FØLLØWS--,/)
      IF(ITYPE-1)920,920,922
920   WRITE(6,903)(NSPATT(NCAT1,IP),IP=1,NQST)
      WRITE(6,903)(NSPATB(NCAT1,IQ),IQ=1,NQST)
      GØ TØ 930
922   WRITE(6,903)(NSPATT(NCAT1,IZ),IZ=1,NQST)
903   FØRMAT(10X,70I1)
      IJTST=IZERØ
C
C        TWØ CATEGØRIES CØMBINED INTØ ØNE--CHECK FØR ADJUNCTS
C                    ØF ØRIGINAL CATEGØRIES
C
930   DØ 665 LJ=1,NCASES
695   IF(INADJ(LJ)-NCAT1)665,696,665
696   IF(INADJ(LJ)-NCAT2)665,697,665
697   IJTST=INADJ(LJ)
665   CØNTINUE
      IF(IJTST-1)675,669,669
```

```
C
C        A CATEGØRY HAD AN ADJUNCT--PREPARE TØ TRY TØ CLASSIFY
C              THE ADJUNCT INTØ THE NEW CATEGØRY
C
669   NNCAT=NCAT1
      NNCSE=IJTST
      KATAJ1(NCAT1)=IZERØ
      KATAJ1(NCAT2)=IZERØ
      NCIPTR=INADR(IJTST)
      DØ 720 MI=1,NCASES
      IF(INADJ(MI)-NCAT1)723,740,723
740   INADJ(MI)=IZERØ
723   IF(INADJ(MI)-NCAT2)720,722,720
722   INADJ(MI)=IZERØ
720   CØNTINUE
      T300=ØNE
      GØ TØ 700
C
C        SEE IF EITHER ØRIGINAL CATEGØRY HAD A CATEGØRY AS AN ADJUNCT
C
675   IJTST=KATAJ2(NCAT1)
      NCCPTR=KØDAJ2(NCAT1)
      IJTST=KATAJ2(NCAT2)
      NCCPTR=KØDAJ2(NCAT2)
      IF(KATAJ2(NCAT1)-NCAT2)725,721,725
725   IF(KATAJ2(NCAT2)-NCAT1)726,721,726
721   KATAJ2(NCAT1)=IZERØ
      KATAJ2(NCAT2)=IZERØ
      T300=ZERØ
      GØ TØ 700
726   IF(IJTST-1)680,676,676
680   T300=ZERØ
      KATAJ2(NCAT1)=IZERØ
      KATAJ2(NCAT2)=IZERØ
      GØ TØ 700
676   NCAT2=IJTST
      KATAJ2(NCAT1)=IZERØ
      KATAJ2(NCAT2)=IZERØ
      T600=ØNE
700   IAD=1
      RETURN
      END
```

Subroutine OUTPUT

```
      SUBRØUTINE ØUTPUT(NRUNS,NRNCTR)
C
C
C        ØUTPUT ØF CATEGØRY PATTERNS
C
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANØST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NØST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDUM(25),IØST(50)
      CØMMØN IQTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      ZERØ=0.
      IØNE=1
      IZERØ=0
      IF(LVL-1)200,200,220
C
C        SAVE ADJUNCTS AT THIS LEVEL AS NEW CASES FØR NEXT LEVEL
C
C        FIRST LEVEL ØF CLASSIFICATIØN
C
200   IXR=IZERØ
      DØ 308 IBD=1,NCASES
      IF(INADJ(IBD)-1)308,304,304
304   IXR=IXR+1
      IØRDER(IXR,IBD)=INADR(IBD)
      IBUFR(IXR,IBD)=IBD
308   CØNTINUE
```

```
C
C        SAVE ORIGINAL CASES IN CATEGORIES, TO BE NAMED AS
C                CASES IN NEXT LEVEL
C
      DO 210 LB=1,NCASES
      IF(NIDCAT(LB)-1)210,203,203
203   IXR=IXR+1
      DO 204 LC=1,NCASES
      IBUFR(IXR,LC)=NSPPAR(LB,LC)
      IORDER(IXR,LC)=NORDER(LB,LC)
204   CONTINUE
210   CONTINUE
      GO TO 35)
C
C        SUBSTITUTE CASES IN EACH CATEGORY AT HIGHER LEVELS FOR
C                THE ORIGINAL FIRST LEVEL CASE NUMBERS
C
220   DO 260 LD=1,NCASES
      IF(NIDCAT(LD)-1)260,212,212
212   DO 240 LE=1,NCASES
      IF(NSPPAR(LD,LE)-1)240,215,215
215   DO 230 LF=1,NCSCSE
      IF(IBUFR(LE,LF)-LF)301,218,301
218   ISPPAR(LD,LF)=LF
      IORDER(LD,LF)=IORDER(LE,LF)
      GO TO 230
301   ISPPAR(LD,LF)=0
230   CONTINUE
240   CONTINUE
260   CONTINUE
C
C        OUTPUT OF PARTIES IN CATEGORIES AND CATEGORY PATTERNS
C
      IF(NRNCTR-1)350,501,350
501   WRITE(7,502)NRUNS
502   FORMAT(1X,I1)
350   IF(LVL-1)310,310,325
310   WRITE(6,380)NRNCTR
C
C        WRITE OUT COMMENT CARD NAMING RUN
C
380   FORMAT(30H TRANSLATION DECK FOR RUN NO. ,I2)
      WRITE(6,381)(ICOMNT(IX),IX=1,20)
      WRITE(7,381)(ICOMNT(IX),IX=1,20)
381   FORMAT(20A4)
      WRITE(6,382)ITYPE,NCASES,NOST,IEXTRA
      WRITE(7,382)ITYPE,NCASES,NOST,IEXTRA
382   FORMAT(1X,I1,1X,I2,1X,I3,1X,I1)
      WRITE(6,383)
      WRITE(7,383)
383   FORMAT(23H LEVEL NO. 1 -- SPECIES)
C
C
C        PRINTOUT LOOP -- PARTIES, ADJUNCTS, PATTERNS, EXTRA CASE
C
      IPCTR=IZERO
325   DO 809 MA=1,NCASES
      IF(NIDCAT(MA)-0)809,809,803
803   IPCTR=IPCTR+1
C
C        PRINTED AND PUNCHED OUTPUT OF CASES A CATEGORY AND ORDER
C
      IF(LVL-1)320,320,8
320   WRITE(6,384)IPCTR
      WRITE(7,384)IPCTR
384   FORMAT(17H SPECIES PATTERN ,I2)
      GO TO 340
8     IF(LVL-2)320,321,326
321   IF(IPCTR-1)322,322,324
322   WRITE(6,385)
      WRITE(7,385)
385   FORMAT(21H LEVEL NO. 2 -- GENUS)
324   WRITE(6,386)IPCTR
      WRITE(7,386)IPCTR
386   FORMAT(15H GENUS PATTERN ,I2)
      GO TO 766
326   IF(LVL-3)6,327,330
327   IF(IPCTR-1)329,328,329
328   WRITE(6,387)
      WRITE(7,387)
387   FORMAT(22H LEVEL NO. 3 -- FAMILY)
329   WRITE(6,388)IPCTR
      WRITE(7,388)IPCTR
388   FORMAT(15H FAMILY PATTERN,I2)
      GO TO 766
330   IF(LVL-4)327,332,160
332   IF(IPCTR-1)333,333,335
333   WRITE(6,389)
      WRITE(7,389)
389   FORMAT(21H LEVEL NO. 4 -- ORDER)
335   WRITE(6,390)IPCTR
      WRITE(7,390)IPCTR
```

```
390   FORMAT(15H ORDER PATTERN ,I2)
      GO TO 766
160   IF(LVL-5)332,162,766
162   IF(IPCTR-1)164,164,165
164   WRITE(6,180)
      WRITE(7,180)
180   FORMAT(21H LEVEL NO. 5 -- CLASS)
165   WRITE(6,181)IPCTR
      WRITE(7,181)IPCTR
181   FORMAT(15H CLASS PATTERN ,I2)
      GO TO 766
C
C        FIRST LEVEL -- PRINT OUT PARTIES IN PATTERN
C
340   WRITE(6,950)(NSPPAR(MA,MB),MB=1,NCASES)
      WRITE(6,950)(NORDER(MA,MC),MC=1,NCASES)
C
C        GET REAL CASE NUMBERS FROM MACHINE CASE NUMBERS
C
      NREAL=0
      DO 360 IRT=1,NCASES
      IF(NSPPAR(MA,IRT)-1)359,358,358
358   NREAL=NREAL+1
      JMACH=NSPPAR(MA,IRT)
      IRLCSE(NREAL)=IDCS(JMACH)
      GO TO 360
359   IRLCSE(IRT)=0
360   CONTINUE
C
C        PUNCH OUT REAL CASE NUMBERS
C
      WRITE(6,394)(IRLCSE(NOT),NOT=1,NCASES)
      WRITE(7,394)(IRLCSE(NOT),NOT=1,NCASES)
394   FORMAT(1X,3512)
      IF(ITYPE-1)399,21,21
21    JDR=IZERO
      DO 25 IGO=1,NCSCSE
      IF(NORDER(MA,IGO)-1)23,24,24
24    JDR=JDR+1
      IRLCSE(JDR)=NORDER(MA,IGO)
      GO TO 25
23    IRLCSE(IGO)=0
25    CONTINUE
      WRITE(7,394)(IORDER(IV),IV=1,NCSCSE)
      GO TO 399
766   WRITE(6,950)(ISPPAR(MA,LH),LH=1,NCSCSE)
3     WRITE(6,950)(IORDER(MA,LJ),LJ=1,NCSCSE)
950   FORMAT(1X,2512,/)
C
C        AFTER FIRST LEVEL--GET REAL CASES FROM MACHINE CASES
C
      MREAL=0
      DO 370 JGO=1,NCASES
      IF(ISPPAR(MA,JGO)-1)185,369,369
369   MREAL=MREAL+1
      MACH=ISPPAR(MA,JGO)
      IRLCSE(MREAL)=IDCS(MACH)
      GO TO 370
185   IRLCSE(JGO)=0
370   CONTINUE
      WRITE(6,394)(IRLCSE(IMZ),IMZ=1,NCSCSE)
      WRITE(7,394)(IRLCSE(IMZ),IMZ=1,NCSCSE)
      WRITE(7,394)(IRLCSE(JJ),JJ=1,NCSCSE)
C
C        PRINTED AND PUNCHED OUTPUT OF ADJUNCTS TO A CATEGORY AND ORDER
C
399   DO 120 JX=1,NCASES
      IF(INADJ(JX)-MA)120,102,120
102   IF(LVL-1)992,992,125
C
C        PRINT OUT REAL CASE NUMBERS OF ADJUNCTS
C
992   WRITE(6,189)IDCS(JX)
      WRITE(7,189)IDCS(JX)
189   FORMAT(9H ADJUNCT ,I2)
      GO TO 199
125   NADJ=0
      DO 195 JCT=1,N
      NADJ=NADJ+1
      IF(IPUER(JX,JCT)-1)193,191,191
191   IDJNCT=IPUER(JX,JCT)
      IRLCSE(NADJ)=IDCS(IDJNCT)
      GO TO 195
193   IRLCSE(JCT)=0
195   CONTINUE
      WRITE(6,194)(IRLCSE(I),I=1,NCSCSE)
      WRITE(7,194)(IRLCSE(I),I=1,NCSCSE)
194   FORMAT(9H ADJUNCT ,2512)
199   IF(KATAJ2(JX)-MA)120,100,120
100   WRITE(6,410)MA,JX
      WRITE(7,410)MA,JX
410   FORMAT(10H CATEGORY ,I2,26H IS ADJUNCTED TO CATEGORY ,I2)
```

```
      GØ TØ 120
120   CØNTINUE
C
C        PRINTED AND PUNCHED ØUTPUT ØF CATEGØRY PATTERN
C
      WRITE(6,951)IPCTR,(NSPATT(MA,MD),MD=1,NOST)
      WRITE(7,951)IPCTR,(NSPATT(MA,MD),MD=1,NOST)
C
C        IF SIMPLE AGREEMENT ANALYSIS, JUST PRINT ØUT TØP ØF PATTERN
C
      IF(ITYPE-1)197,196,196
196   WRITE(6,951)IPCTR,(NSPATB(MA,ME),ME=1,NOST)
      WRITE(7,951)IPCTR,(NSPATB(MA,ME),ME=1,NOST)
951   FØRMAT(1X,4HCAT ,I2,3X,70I1,/,1(10X,70I1))
C
C        SEE IF EXTRA PARTY EXISTS TØ CØMPUTE PERCENTAGES
C
197   IF(IEXTRA-1)809,51,51
51    DØ 10 IBAT=1,NOST
      NXTTT(IBAT)=9
      NXBBB(IBAT)=9
10    CØNTINUE
C
C        AN EXTRA PARTY EXISTS--CØMPUTE PERCENTAGES
C
      QCAT=ZERØ
      ATCTR=ZERØ
      BKYCTR=ZERØ
      DØ 55 NEX=1,NOST
      IF(NSPATT(MA,NEX)-9)719,55,719
719   QCAT=QCAT+1.
      IF(NSPATT(MA,NEX)-ISVTØP(IVN,NEX))720,721,720
721   IF(NSPATB(MA,NEX)-ISVBØT(IVN,NEX))720,722,720
722   ATCTR=ATCTR+1.
      NXTTT(NEX)=NSPATT(MA,NEX)
720   IF(NSPATT(MA,NEX)-ISVBØT(IVN,NEX))55,723,55
723   IF(NSPATB(MA,NEX)-ISVTØP(IVN,NEX))55,724,55
724   BKYCTR=BKYCTR+1.
      NXBBB(NEX)=NSPATB(MA,NEX)
55    CØNTINUE
      IF(ATCTR-BKYCTR)730,732,732
730   FRHØ=BKYCTR/QCAT
98    WRITE(6,92)MA,(NXBBB(KT),KT=1,NOST)
      WRITE(7,92)MA,(NXBBB(KT),KT=1,NOST)
      GØ TØ 740
732   FRHØ=ATCTR/QCAT
99    WRITE(6,92)(NXTTT(KX),KX=1,NOST)
      WRITE(7,92)(NXTTT(KX),KX=1,NOST)
92    FØRMAT(9H CASE FIT,1X,70I1)
740   VHØKY(IPCTR)=FRHØ
809   CØNTINUE
      RETURN
      END
```

Subroutine OUTPC

```
      SUBRØUTINE ØUTPC
C
C
C        CALCULATIØN AND ØUTPUT ØF PERCENTAGE FIT ØF EACH CASE
C                    INTØ EACH CATEGØRY AT THIS LEVEL
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANOST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØRC
      CØMMØN ITØRB1,ITØRB2,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NOST
C
C        ØNE DIMENSIØNAL ARRAYS
C
      CØMMØN DTBLK(50),DTELN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADR(25),INCSE(25),INDIM(25),IOST(50)
      CØMMØN IOTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25 50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAØ(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCR1B(25,25),RSCR2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      ZERØ=0.
      IZERØ=0
      BCTR=ZERØ
      TCTR=ZERØ
      DØ 550 IRA=1,NCSCSE
      IØK=IZERØ
```

```
      DØ 540 IRB=1,NHØLES
      OCAT=ZERØ
      IF(NIDCAT(IRB)-0)521,540,521
521   IØK=IØK+1
C
C        CØMPUTE PERCENTAGES ØF EACH ØRIGINAL CASE IN EACH CATEGØRY
C                AT THIS LEVEL
C
      DØ 530 IRC=1,NØST
      IF(NSPATT(IRB,IRC)-9)529,530,529
529   OCAT=OCAT+1.
522   IF(NSPATT(IRB,IRC)-ISVTØP(IRA,IRC))526,523,526
523   IF(NSPATB(IRB,IRC)-ISVBØT(IRA,IRC))526,524,526
524   TCTR=TCTR+1.
526   IF(NSPATT(IRB,IRC)-ISVBØT(IRA,IRC))530,527,530
527   IF(NSPATB(IRB,IRC)-ISVTØP(IRA,IRC))530,528,530
528   BCTR=BCTR+1.
530   CØNTINUE
50    IF(TCTR-BCTR)532,533,533
532   FRA=BCTR/OCAT
      GØ TØ 535
533   FRA=TCTR/OCAT
C
C        SAVE FRACTIØNS ØF EACH CASE RUN ACRØSS ALL CATEGØRIES
C
535   PRCENT(IRA,IØK)=FRA
      OCAT=ZERØ
      BCTR=ZERØ
      TCTR=ZERØ
      ATCTR=ZERØ
      BKYCTR=ZERØ
540   CØNTINUE
550   CØNTINUE
C     GET AN ARRAY ØF INTEGERS
      DØ 552 JØFF=1,18
      NUM(JØFF)=JØFF
552   CØNTINUE
C
C        ØUTPUT ØF CASES RUN ACRØSS CATEGØRIES
C
      WRITE(6,585)(NUM(NXØ),NXØ=1,NSPCTR)
585   FØRMAT(11X,9(5H CAT ,I2,3X))
586   FØRMAT(8X,9(4HCAT ,I2,2X))
      DØ 560 IRD=1,NCSCSE
      WRITE(6,582)IDCS(IRD),(PRCENT(IRD,IRE),IRE=1,NSPCTR)
      WRITE(6,760)
760   FØRMAT(1X,/)
587   FØRMAT(5H CSE ,I2,1X,9(F5.2,3X))
582   FØRMAT(6H CASE ,I2,3H = ,2X,10(F5.2,5X))
560   CØNTINUE
C
C        IF EXTRA PARTY EXISTS PRINT ØUT PERCENTAGES
C
      IF(IEXTRA-1)810,81,810
81    WRITE(6,750)(VHØKY(KH),KH=1,NSPCTR)
750   FØRMAT(6H EXTRA,9(F5.2,3X))
810   RETURN
      END
```

Subroutine LEVEL

```
      SUBRØUTINE LEVEL
C
C
C     BEGIN READJUSTMENTS FØR NEW LEVEL
C
C
C        VARIABLES IN CØMMØN
C
      CØMMØN ANØST,BGCCAT,BGICAT,BIGIND,ICAUSE,IEXTRA,INCØNS,IØPC
      CØMMØN ITØRB1,ITØP32,ITYPE,IVN,IXSPCR,KD,KSPCTR,LVL,NCASE1,NCASE2
      CØMMØN N,NCASES,NCAT1,NCAT2,NCCPTR,NCSCSE,NHØLES,NCSCTR,NCIPTR
      CØMMØN NNCAT,NNCSE,NPTR,NSPCTR,NØST

         ØNE DIMENSIØNAL ARRAYS

      CØMMØN DTBLK(50),DTBLN(50),ICØMNT(20),ICTAG(25),IDCS(25)
      CØMMØN INADJ(25),INADP(25),INCSE(25),INDUM(25),IØST(50)
      CØMMØN IØTBL(300),IRLCSE(25),ITAG(25),KATAJ1(25),KATJJ2(25)
      CØMMØN KØDAJ1(25),KØDAJ2(25),NIDCAT(25),NUM(25),NUMIND(25)
      CØMMØN NXBBB(300),NXTTT(300),TBLK(50),TBLN(50),VHØKY(50)
C
C        TWØ DIMENSIØNAL ARRAYS
C
      CØMMØN DFCTR(25,50),FCTR(25,50),IBUFR(25,25),IDPY(25,2)
      CØMMØN IØRDER(25,25),ISPPAR(25,25),ISVBØT(25,300),ISVTØP(25,300)
      CØMMØN ITPATB(1,300),ITPATT(1,300),NDATAB(25,300),NDATAT(25,300)
      CØMMØN NØRDER(12,25),NSPPAR(12,25),NSPATB(12,300),NSPATT(12,300)
      CØMMØN PRCENT(25,12),RSCR1T(25,25),RSCP1B(25,25),RSCP2T(25,25)
      CØMMØN RSCR2B(25,25),SCR1B(25,25),SCR1T(25,25),SCR2T(25,25)
      CØMMØN SCR2B(25,25),SCR3B(25,25),SCR3T(25,25)
      IZERØ=0
```

```
C
C        SAVE REAL NUMBER ØF CASES IN EACH ARTIFICIAL CASE
C
      DØ 105 I=1,NCASES
      INDUM(I)=NUMIND(I)
105   CØNTINUE
810   JZZ=0
      DØ 880 MØX=1,NCASES
      IF(INADJ(MØX)-1)880,845,845
845   JZZ=JZZ+1
430   DØ 860 LØX=1,NØST
      NDATAT(JZZ,LØX)=NDATAT(MØX,LØX)
      NDATAB(JZZ,LØX)=NDATAB(MØX,LØX)
860   CØNTINUE
859   ITAG(JZZ)=ITAG(MØX)
      IF(LVL-1)795,795,777
795   NUMIND(JZZ)=1
      GØ TØ 880
777   IAJCTR=0
      DØ 780 LP=1,NCSCSE
      IF(IBUFR (MØX,LP)-LP)780,782,780
782   ISPPAR(JZZ,LP)=IBUFR(MØX,LP)
      IØRDER(JZZ,LP)=IØRDER(MØX,LP)
      IAJCTR=IAJCTR+1
780   CØNTINUE
      NUMIND(JZZ)=IAJCTR
880   CØNTINUE
      DØ 830 MH=1,NHØLES
      IF(NIDCAT(MH)-0)830,830,812
812   JZZ=JZZ+1
      IF(LVL-1)106,106,107
106   NUMIND(JZZ)=NIDCAT(MH)
      GØ TØ 111
107   ISVIND=IZERØ
      DØ 110 K=1,NCASES
      IF(NSPPAR(MH,K)-1)110,108,108
108   M=NSPPAR(MH,K)
      ISVIND=INDUM(M)+ISVIND
110   CØNTINUE
      NUMIND(JZZ)=ISVIND
111   ITAG(JZZ)=ICTAG(MH)
      DØ 840 MJ=1,NØST
      NDATAT(JZZ,MJ)=NSPATT(MH,MJ)
      NDATAB(JZZ,MJ)=NSPATB(MH,MJ)
840   CØNTINUE
830   CØNTINUE
      IF(LVL-1)140,140,150
150   DØ 400 NBUF=1,NCASES
      DØ 405 JBUF=1,NCSCSE
      IBUFR(NBUF,JBUF)=ISPPAR(NBUF,JBUF)
405   CØNTINUE
400   CØNTINUE
140   LVL=LVL+1
      NCASES=JZZ
      JZZ=JZZ+1
      DØ 899 IUFF=JZZ,NCASES
      NIDCAT(IUFF)=0
      ICTAG(IUFF)=0
      DØ 890 MUFF=1,NØST
      NDATAT(IUFF,MUFF)=9
      NDATAB(IUFF,MUFF)=9
890   CØNTINUE
899   CØNTINUE
      RETURN
      END
```