TECHNICAL REPORT

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ORGANIZATIONAL DIAGNOSIS: A REVIEW AND A PROPOSED METHOD

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EXECUTIVE SUMMARY

One of the tasks proposed in the research effort from which this report has stemmed was to "...explore the feasibility of developing a computerized diagnostic report generator." As the body of the report indicates, we have been able to go considerably beyond simple feasibility exploration. Presented here is a description of CANOPUS (a computerized diagnostic and prescription software system), together with an account of progress made to date in its construction. We anticipate that, when complete, it will form a useful, serviceable tool for HRM consultants and their client units.

STATEMENT OF THE PROBLEM

An organization is an open social system, which means that it functions by receiving inputs of resources and energy from the outside world, converts them by a throughput process to a commodity or service which it then exports into the environment in return for replenishment of its resource input. In greatly oversimplified form, one might view the Navy in social systems terms as receiving inputs from American society in the form of manpower from the civilian population and money appropriated by its Congress. The Navy by its functioning converts these resources into an output of defense of the nation, which it "exports," in the sense that it makes it visible, present, and useful in the world.

In the Navy, as in any system, not all of the input appears at the end of the cycle in the form of output. Some of the input must necessarily be consumed in the throughput process itself; that is, some proportion must be diverted to maintain the organization. The more of the input that must be so diverted, in relation to a given output, the less effective the organization is.

The efficiency of the throughput process therefore largely determines the organization's effectiveness, and it is to the improvement of this ratio that organizational development activities such as the Navy's Human Resources Management effort are directed.

In general, development (in the view of those who study living systems) is a function of the appropriate combination of two kinds of things: (1) characteristics of the system which predispose it to experience certain kinds of change (such as particular leadership practices) and (2) events external to it which cause or "trigger" the change to occur when it does (such as training or intervention activities). Characteristics such as leadership practices exist before the consultant arrives on the scene and are necessarily quite varied in form and style. Any specific thing that the consultant does by way of training or intervention is unlikely to be appropriate to all (or even any large number) of such situations. To affect the functioning of the unit constructively, therefore, requires that one carefully match the intervention activity to the needs of each client unit. This, then, is the problem of diagnosis in organizational development--describing organizational characteristics in sufficient detail and with enough accuracy to permit one to match available intervention activities to diagnosed conditions in ways likely to improve effectiveness.

THE PROPOSED PROCEDURE

It is to this set of issues that CANOPUS is addressed. As a procedure, its unique features are the following:

(1) It is almost entirely computerized, which permits it to take account of a wider array of information with greater reliability, validity, and speed than would be possible by methods which rely upon more "clinical" procedures.

(2) It prioritizes problems for attention by the manager or consultant, not only in terms of the level of goodness or badness of the characteristics, but in terms of their relationships to performance criteria as well.

(3) It goes beyond the simple description of strengths and problems to an assessment of their causes (situational factors, information needs, skill deficiencies, and values conflicts).

(4) It recommends possible training or intervention steps which accumulated experience suggests are optimal for situations like the one in hand.

(5) It summarizes both conditions and treatment steps across organizational entities and generates, by computerized text-writing, a written report for managers and their consultants.

Not all of the steps are at present constructed. Two of the initial and most difficult are, however, and it is our hope that the remaining ones will be completed within the next few months.

CONTENTS OF THE REPORT

From this brief overview, the reader may turn, if he chooses, to the body of the report. The first section contains a review of the problems and issues present in organizational diagnosis. We anticipate that this section will be especially useful to consultants, who face almost daily the problems involved in diagnosis and action planning. The second section describes in some detail the CANOPUS procedure and its components, while the appendices provide documentation of the first two such components. These sections, we feel, will be of special interest to those who must handle and analyze survey data for development purposes.

A CONCLUDING NOTE

In designing and beginning the construction of CANOPUS, it has been our intention to provide a tool, not a straightjacket. Like any tool which depends upon systematically stored experience, this one should grow in strength and usefulness as it is used. It is our hope, therefore, that it will be not only useful, but used.

ORGANIZATIONAL DIAGNOSIS: CONCEPTS, ISSUES, AND METHODS

The research proposal stated the following:

> An indicator-based development program such as the Navy Human Goals Plan is only as good as the information system upon which it is based. Data bank storage, retrieval, analysis, and processing capabilities (similar, in at least some aspects to those already in place in the civilian sector in our own data bank) must be established, tested, and subjected to at least a preliminary evaluation...as part of this we would explore the feasibility of developing a computerized diagnostic report generator. (p.3)

The purpose of this present technical report is to fulfill the intent of that concluding phrase. As the reader will soon see, we have been able to go considerably beyond the simple feasibility exploration proposed at the outset. A computer software package has been developed which provides a basic capability of computerized diagnostic report generation most particularly geared to the organizational development process.

In the sections which follow, we shall review first of all the issues, methods, and problems of diagnosis in organizational development, and then in later sections, describe the form and substance of the procedure which has been developed in the present instance. Documentation of the computer software is attached as Appendix A followed by sample printout produced by that software as Appendix B.

The Problem of Diagnosis in Organizational Development

An organization is an open social system. In its most rudimentary form this means that it functions by receiving inputs of resources and energy from the outside world, converts them by a throughput process to a commodity or a service which it then exports into the environment in

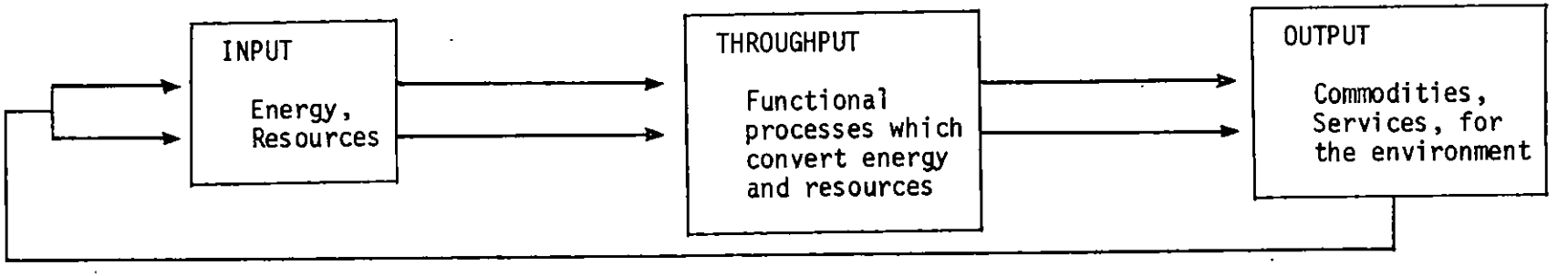
return for the replenishment of its resource input. Thus, the cycle repeats and continues. The process is illustrated in Figure 1 both in its general form of an input-throughput-output sequence, and more specifically as it applies to the Navy. In greatly oversimplified form, one might view the Navy in social system terms as receiving inputs from American society in the form of manpower from the civilian population, and money appropriated by its Congress. The Navy by its functioning converts these resources, the energy and talents of the people, and the financial resources appropriated by legislation into an output of defense of the nation, which it "exports," in the sense that it makes it visible, present, and useful in the world. In return for that output, more manpower accrues, new financial resources are appropriated, and thus the cycle repeats itself. In abstract terms the Navy's effectiveness as an organization is represented by the amount of such national defense output which it is able to generate for the inputs received.

In any system, not all of the input appears at the end of the cycle in the form of output. Some of the input must necessarily be consumed in the throughput process itself. Organizations live and exist, and must be maintained. A portion of the input in any system, therefore, is diverted to the maintenance of its internal functioning. The more of the input that must be so diverted, in relation to a given output, the less effective the organization is. Stated in more dynamic terms, an increase in effectiveness amounts to attaining more and/or better output for the same input, or of attaining the same output with less input.

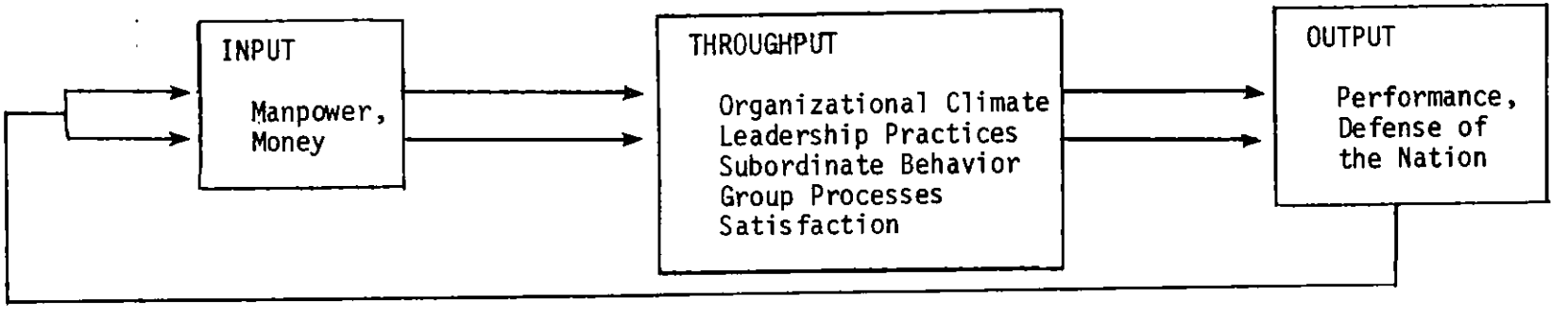
As the only remaining variable, the efficiency of the throughput process itself largely determines this characteristic. It is to this

Figure 1

The Organization as a Social System



The Navy as a Social System



problem that organizational development addresses itself, since it represents a systematic planned attempt to upgrade aspects of the throughput process. These upgrading attempts are basically instances of planned, purposeful, constructive change. Change, in the view of those who study living systems is in turn a function of the appropriate combination of two kinds of things: (1) characteristics of the system itself which predispose it to experience certain kinds of change, and (2) events external to it which cause or "trigger" the change to occur when it does. A simple illustration may suffice--jet fuel is combustible, that is, it has a propensity to burn. For a fire to occur aboard ship involving aviation fuel requires a combination of that fuel itself and an appropriate trigger, for example, a flaming match. A flaming match, or a lit cigarette, in a pool of loose fuel will trigger a fire. A biscuit, or a handkerchief, dropped in that same pool of fuel, will not trigger combustion.

Simple and perhaps absurd as this illustration is, it describes in many ways the issue lying at the heart of organizational development. Organizations have characteristics which comprise their functioning, for example, the climate present in the organization, the supervisory behavior of its managers, the mutual behavior of subordinates in the work setting, and the processes of the groups that make it up. For any particular subordinate unit, its particular combination of behaviors and conditions predispose it toward being affected by certain external conditions, not by others. Organizational development interventions, training, and even changes in the external world in which it lives, vary in the impact which they have on different combinations of such conditions. To affect the throughput process of an organizational unit constructively, what one

must do is be certain that an appropriate set of interventions inpinge upon the conditions in that unit. Necessarily, no intervention, training activity, or external event, is relevant to all situations. Rather by their very nature, particular interventions selectively influence organizations with certain characteristics rather than others. Matching the intervention to the organization and its configuration of behaviors, strengths, and problems, requires that one understand what that configuration of strengths and problems is. This is in effect, a problem of diagnosis in organizational development--describing organizational characteristics in sufficient detail, and with enough accuracy to permit one to match available intervention activities in ways likely to produce constructive change.

As a discernible field, organizational development is comparatively young. Burke (1973) has indicated that it is barely 15 years old, although various elements that currently are viewed as comprising it date from an earlier period. As a whole--let alone an integrated whole--it seems indisputable that the field is still in its infancy. As a field, it traces its lineage in two related, but different, directions: (1) the world of the practitioner, as, for example, adult education, clinical practice, and the like, and (2) the utilization of scientific research findings in organizational behavior. From the former has stemmed an action orientation, together with a growing concern for accomplishing action objectives more expeditiously and in higher quality fashion. From the latter (scientific research), the field has inherited from the cannons of science a concern for accuracy, along with an awareness of the importance of implementing research findings.

Melded and interwoven, these dual sets of concerns have led to the general recognition that at least two major processes (not just one) are involved in the O.D. field--diagnosis and treatment (Bowers & Norman, 1969). The result is that diagnosis has received increasing attention in recent years. Prominent writers in the field have talked at moderate length about the necessity for a solid diagnosis as a basis for action. Practitioners, similarly, have talked repeatedly about the role played in their efforts by a process that they see as diagnostic. Despite this increased attention, much would appear to constitute less than a satisfactory approach to the problem. While increasingly talked about, diagnosis would appear more often to be paid lip-service than to receive serious attention. The following quotation from Levinson illustrates the nature of the problem:

> That brings us to the problem of diagnosis...I do not yet see that kind of diagnostic process in the literature or in practice which leads to intervention of choice: given an organization of a given kind, at a given point in its development, with given kinds of constituencies and groups of employees, with a given kind of leadership and a given set of problems, what should the strategy of intervention be? toward what anticipated outcome? (Levinson, 1973, p. 201)

To serve the purposes which its name, and its role, intends, a diagnosis should constitute an analysis of the current functional state of a particular system for purposes of determining appropriate treatments (action steps, or interventions). Both the name and this brief definition imply a number of characteristics which should be reflected in any methodologically sound diagnostic effort:

(1) Comprehensiveness - since problems may originate and occur in any part or aspect of a system, any diagnostic effort worthy of the name should treat comprehensively the properties of the system as such, that is, it should not look selectively at a few aspects

of system functioning, ignoring the rest. It should, instead, make as complete an effort as possible at assessing the total functional state of the system.

(2) Theoretical Anchorage - a good diagnosis should look, not merely at an arbitrary array of properties, but at an array of constructs which reflect an underlying scheme that is itself sensible, and which has been derived from the real world by a process of solid research. This framework serves to provide explanatory power by indicating how in general (that is, in most such organizations) various aspects of functioning should relate to one another. Without this, the problem becomes an assessment based upon a somewhat haphazard collection of readings.

(3) Precedence - both its name and its role imply that diagnosis precede and, in part at least, determine which particular treatment from an array of possible treatments should be used in the situation at hand.

(4) Orientation - diagnosis implies an orientation on the part of the consultant primarily toward the client system's well-being rather than simply toward his own.

(5) Differential - diagnosis implies a differential, that is, that there are different states of nature which the employed assessment techniques distinguish from one another, and which ultimately have different action implications.

By way of contrast, there are several things that a diagnosis should not be. It should not be a simple benchmark against which to measure progress. Used in this way, diagnosis would amount to little more than

an evaluation, since it would carry the implication that treatment is determined on some basis other than system assessment. Despite this fact, there would appear to be, at least, some instances in which practitioners welcome measurement, not for the treatment guidance which it provides, but simply to provide possibilities for "proof positive."

Similarly, a diagnosis should not be merely a "map of pitfalls" which permit the consultant to do what he always does anyway, but with minimum risk to himself and others. Using it as a map of pitfalls means that its role in determining treatment is denied it. This use biases as well, to some extent at least, against an orientation toward the client system's well-being first and foremost, and even perhaps negates a bit the differential character which is so necessary for effective guidance of the treatment process.

Finally, differential diagnosis is not simply a matter of variety among consultants. Occasionally writers and practitioners cite the variety of things done by different consultants, or change agents, as evidence for the eclecticism present in the field, and infer from this that treatments are indeed differentially selected on a diagnostic basis. Levinson, in the article previously cited, correctly describes the misleading nature of such a representation. The fact that different consultants employ different techniques says nothing about the extent to which any one of them selects, from among a wide array of quite different treatments, the one which he will in fact use in a specific instance upon the basis of a solid diagnosis of that system's own functioning. The eclecticism, in other words, is not a matter of simple variety in methods and practices among consultants, each of whom may well be highly consistent in what he does from one situation to the next.

We thus arrive at a view that solid, rigorous diagnosis, differential in character, comprehensive against a theoretical framework, is an essential step in determining which treatment to use for purposes of enhancing a particular client system's well-being. It is not a simple benchmark; it is not merely a map of pit-falls; nor is it a matter simply of pointing to the practice differences among consultants. Its usefulness depends upon the care which has been used in doing it, and it is to this issue that we now turn our attention.

Collecting Diagnostic Data

Although an infinite number of data collection methods may be possible, generically they would appear to fall into a quite limited number of categories. Each has its strengths and its weaknesses, and across the lot cut a number of potentially difficult issues. In this section we will first examine the various methods and then look at issues and problems which relate to them.

Methods

The methods of collecting diagnostic data fall basically into two general classifications: (a) those which rely upon the diagnostician's collecting the perceptions of others, and (b) those which rely upon the diagnostician's own more or less direct perceptions. Within the first of these two categories (collecting the perceptions of others) two principal methods have widespread currency - the interview and the questionnaire. These two are not as different in theory as they may appear to be in practice. In the interview, one human being poses to others in verbal form a

series of questions and records their responses. In form, then, it relies upon a human interviewer, and the questions are likely to be relatively open-ended (that is, calling for an expressed view which is recorded as nearly as possible in the respondent's own words). Interviews may be relatively unstructured, in the sense that the questions may be highly general ones whose purpose is to trigger a response recorded verbatim in the respondents own words, or a relatively structured set of questions and probes targeted toward specific pieces of information. The interviewer may, in fact, serve the function in highly structured interviews of simply reading a questionnaire to the respondent and making his checkmarks for him. Included within the general bailiwick of the interview for diagnostic purposes we would include group process meetings. One example of this is cited by Delbecq and Van de Ven (1971). In the particular instance which they describe, a number of members of a client system were brought together for a meeting to discuss their individual and common problems. The process employed was highly structured, with relatively pre-programmed sequences of posting, digestion, analysis, decision making, and the like. The substance of the diagnosis, however, was provided by the participants and was generated from their discussions in the phased meetings. Another example, closer to the Navy's operations, is the Command Action Planning Seminar (CAPS). Somewhat different from this might be the group interview where a series of questions, structured or unstructured, are posed by an interviewer to a group of people, and their collected responses, or perhaps their various individual responses, are noted.

The paper-and-pencil questionnaire is a second of the "indirect" methods. In this instance, the questions are highly structured, specified in advance, duplicated or printed in booklet form, and ordinarily designed to permit largely closed-end responses. Normally, the permitted responses take the form of multiple-choice categories using some form of Likert scale. An alternative to this procedure, proposed in the literature by Jenks (1970), is a Q-sort in which a number of statements are sorted by the respondent to an order corresponding to, for example, their description of him, their description of his supervisor, of the organization, of some part of its processes, or of his fellow employees.

The methods which rely upon the perceptions of the data collector himself encompass both observation and records retrieval, the latter perhaps a marginal member of this category. Observation may take the form of direct reading, or of indirect inference. Direct readings may be person-mediated; for example, an individual observer notes the activities, behavior, or reactions of members of the client system during a particular period of time. The resulting data are subsequently used in diagnosis. In somewhat different form, observations may be instrument-mediated as, for example, when audio or video tapes are made of behavior or reaction segments in the client system, and these tapes are then submitted to a diagnostic analysis.

In all of these direct observation instances, the purpose is to assess the functioning of the system by a procedure which records the contents of that functioning. Somewhat different from this is

indirect inference, also based upon observation, which assumes some of the characteristics of projective techniques. In such an instance, the observer would record, not the substance of what was said or done, but the expressions used to say it or the manner in which it was done. He might then infer various functional characteristics, not from the direct observation of their presence or absence, but from the words, terms, and manners by which the material had been related. For example, non-verbal cues, facial expressions, or posture during the interview, might be noted, whether the interviewee attributed problems to himself or others (perhaps regardless of their content), or blames factors outside the system might be seen as indicating his defensiveness. The extent to which the interviewee uses evaluative or emotion-laden terms might be noted and seen as indicative of one or another functional state. The respondent's degree of consistency might be taken into account, and the like. Although the questions asked by the interviewer might be identical to questions asked in a direct reading situation, the material recorded would be far different and would reflect more the respondent's manner of answering than the substance of his answer. (c.f., Alderfer, 1968)

Finally, diagnostic material may be retrieved directly from the operating records of the organization itself. Although most organizations do not maintain updated files of information directly concerned with the behavior of members and organizational processes such as, decision-making, motivation, and the like, in many instances material appropriate to a diagnosis of these aspects of system functioning may be obtained from memoranda, policy statements, and

the accounting and control records maintained by the organization. Although the material entered into such records has been, at one stage or another, perceived by a person other than the diagnostician, we class them here in the direct perception category because they comprise, in most instances, fundamental operating data which are then directly perceived by the diagnostician in the diagnostic process.

Although a number of variations on these methods may exist--in fact, the number may be infinite--there would appear to be at least reasonable ground for concluding that they may be categorized into one or another of these general classifications. Still, the goodness of the methods is affected by a number of considerations not directly discernible from a consideration of the methods themselves, and it is to these issues that our attention now turns.

Issues and Problems

Cost and Complexity

In general, observational techniques are the most costly, followed by interviews, with questionnaires the least costly of the proposed techniques (records retrieval is omitted from this comparison because the cost issues are determined in this instance largely by the issue of accessibility to which we will turn our attention shortly). Cost is, in this comparison, rather directly determined by the amount of "chaff" which must be sorted, covered, or sifted through to obtain a given amount of useable, relevant material. Since observation focuses its attention necessarily upon events as they occur, all events,

both those relevant and those irrelevant, must be observed, although the latter may be discarded. The interview, on the other hand, focuses attention upon germane issues, at least to some extent, and, hopefully by that process, eliminates much of the extraneous material, recording instead the useable and relevant. It is still more costly than the questionnaire, however, because for each word spoken, another person must consume time in the listening. The questionnaire, since it does not require a one-to-one human relationship for its completion, and since it prespecifies the material to be collected rather closely, is certainly the least costly of the three.

Training and Skill Required

Diagnostic data are only as useful as they are reliable and valid, and the obtaining of reliable, valid data hinges largely upon the training and skill brought to bear in the collection process. When observational methods are employed, the observers must obviously be highly skilled and trained. If they observe the functioning situation directly, they must know how to record their observations, know the appropriate amount of detail to register, and know how to distinguish one event sequence from the next, that is, how to know when one activity has stopped and another has begun. They must know both how not to be distracted from relevant ongoing activity by peripheral stimuli, and at the same time, know which

peripheral stimuli are in fact relevant to the process they are supposedly observing and which they wish to record. When the observation is instrument-mediated, an additional entire array of technical difficulties are encountered which the subsequent observer-user must know how to handle and solve. Needless to say, indirect inference--the use of semi-projective techniques--requires a high degree of competence and an extensive background in the projection process itself.

Since the observer, in addition to all of these difficulties, is ordinarily an outsider, unfamiliar with the history of the unit whose functioning he is observing, unaware of the double, hidden, and mutually understood meanings of particular phrases, behaviors, actions, and cues, it is likely that his readings will be less reliable and less valid than those which would be provided by familiar "insiders." By standardizing the stimuli in the form of the questions posed to the interviewee, and by relying upon the interviewee's perceptions and interpretations of ongoing functioning, the face-to-face interview removes, at least a part, if not most, of the principal sources of unreliability. To do this, however, requires carefully trained interviewers. It is not simply a matter of any person, with a reasonable degree of intelligence, traveling through the organization asking questions and noting responses. The problem of interviewer bias, as well as of interviewer-induced response bias, is simply too great for that. Yet, in many instances, O.D. practioners rely upon informal interviewing as a source of diagnostic data oblivious to the

pit-falls. The questionnaire, posing as it does the same question in the same form to all respondents and relying upon their familiarity over a period of time with events in the organization, goes the greatest distance, in our judgment, toward resolving the problems of reliability and validity.

Still, what each of these methods contributes in reliability and validity, it to some extent loses in flexibility. Clearly, since little if anything is prestructured, observation permits the greatest degree of flexibility in accounting for unique events in the setting. The interview, if it uses optional probe questions, may take at least some account of this. The structured questionnaire permits little, if any, of this, and its usefulness and validity in the larger sense rely upon the care and comprehensiveness which went into its construction at the outset. Administering questionnaires, of course, requires some training and acquired skill. In general, however, the degree of training and skill required for questionnaire administration is less than that required for interviewing or observation. However, it should be noted that the amount of training and skill going into questionnaire construction is fully as great as the skill required in the other two methods. The difference is that, in the case of the questionnaire, this has been done "once for all." It need not be repeated in each data collection instance, provided that a common or standard instrument is used.

The Problem of N

A diagnosis is as good as the data upon which it is based. To be adequate the data must therefore reflect a fairly large number of specific instances of each situation. In the case of the questionnaire, and to a lesser degree the interview, the data collector (the questionnaire itself, or the interviewer) asks the respondent to summarize, in formulating his response, some appropriate number of occasions in which a particular type of activity has transpired. In the observational instance, however, the number of instances of a particular functional property which may be taken into account are those which have occurred during the time-frame of the observation. This is directly a function of the method itself, and means that a much longer, and therefore more costly, period of information recording must go on in order to encompass the same number of behavioral "cases."

The Sampling of Events

Diagnostic data to be accurate must constitute a representative sample of the universe of behaviors or functional states which they are drawn to reflect. In the case of observational methods, the sample which occurs may reflect too limited a time period to make this possible, or the existence of the observer (the human being doing the observing or the instrument) may well itself distort the events which it is intended to monitor. The methods which rely upon the perceptions of the respondents

themselves rely for the representativeness of their sampling upon the respondent's memory and willingness to encompass a sufficiently broad range. In any specific instance distortions may occur. Nevertheless, the array of events which may at least potentially be taken into account would seem to be larger than in the case of observation. Still it should be kept in mind that the demeanor of the interviewer, or the wording of the questionnaire items, as well as the content encompassed in phrasing the items or questions, may well serve to distort the sample.

Accessibility Problems

All methods suffer to some extent from accessibility problems. Not all participants, nor all situations, may lend themselves to observation. Calendars and time schedules may make it difficult to interview all the necessary members, and potential respondents may absent themselves from questionnaire administration group sessions, or neglect to return distributed or mail-out questionnaires. Accessibility becomes the largest issue, however, in relation to operating records since in these instances, one is ordinarily relying for his information upon records and record keeping systems which were set up with other purposes than diagnosis in mind. Records may not exist, they may be tabulated or compiled in other forms, or they may in fact be considered confidential and denied to the diagnostician.

Time Lag as a Problem

Organizations are dynamic entities, and events move across them in time, creating waves or ripple effects in which a series of events at one time in one part of the system cause other events at other points in time in the same or other parts of the system. Thus, there is an issue to the extent that the data collection method used may not permit aggregation in the respondent's mind which is based upon his knowing precisely what the collected data are intended to represent. Today's events which are being observed, for example, may be the outcome of other events long since past. Operating records may reflect functional states which existed several years previously but which no longer remain. Solving this problem requires that the diagnostician not only know the nature of the constructs which he is measuring and their place in an appropriate cause-effect sequence, but also that he understand the relationship between the specific questions posed or items sought and that theoretical framework. Lacking these, he runs considerable risk of misreading the situation.

Analyzing and Integrating Diagnostic Data

Diagnostic data, once collected, are useless unless submitted to an analytic, synthetic process which integrates those data into an interpreted, coherent form. The methods, issues, and problems of this aspect of diagnosis are fully as important as the collection itself.

Methods

Both quantitative, and non-quantitative methods have currency in existing practice. Non-quantitative methods include narrative summaries of verbal material prepared in some form by the diagnostician or consultant and phrased in his own words or those of the respondents, participant group derivation sessions in which the material is viewed, reviewed, revised, and analyzed by the participants and a conclusion or interpretation generated by them, and the (expert) staff conference in which a group of professionals, perhaps differing in their backgrounds, review the same or substantively somewhat different portions of the data and pool through a discussion procedure their conclusions to a general and meaningful reading. By nature, these non-quantitative methods are largely descriptive; although some use may be made of quantitative material, the emphasis is instead upon the narrative description.

Quantitative methods, on the other hand, require that the data originally collected be converted to numerical scales, either through direct conversion (for example, by key punching or by an optical scanning scoring process) or by the content analysis of verbal material. In the latter case, trained content analysts read or listen to the original material and score each segment in terms of preestablished codes.

Issues and Problems

Time-sampling, Time-frame Problem

Time enters in the interpretation, as it did in the collection, as a potentially confounding issue. Great care must be

taken in the analysis and interpretation of diagnostic data to be certain that events are correctly attributed in the cause-effect sequence in terms of the time sample during which they were collected, or which was taken into account by the respondent in formulating his answers, as well as the historical time-frame which each functional reading represents. Lacking this, the picture which results may be a caricature rather than a reasonable likeness, and the tail may all too often be interpreted as wagging the dog. No handy rule-of-thumb is possible in handling this problem. It requires instead substantial background and technical expertise in the area of organizational data collection. Still, in part the problem may be solved by pre-programming the steps and relying upon computerized processes designed by those persons who do have the necessary expertise.

Expertise Versus Involvement

Persons are known to be more motivated by processes in which they are involved. At the same time, diagnosis of an organization and its functional state is a complex skill. To some extent, therefore, the analytic, interpretive aspects of diagnosis pose a dilemma between a necessity for bringing to bear the expertise of the technically trained without sacrificing the motivated involvement of the participants themselves. It is a tightrope which requires a careful tread. Most especially, it requires that the expertise requisite for the process not be delivered in a fashion which antagonizes, becomes overbearing,

or appears to denigrate the participants, their knowledge, and their importance.

The Confounding Problem - Horseback Revisions

Even the most accurate diagnosis may suffer from mid-stream or horseback revisions made by the consultant as he approaches its use. Basically, any data collection and analysis method treats with some degree of care and accuracy a portion, but not all, of the behaviors, events, and issues in the life space of the client system. Some portion is unique to that system, or to any group within it, or will have been excluded from the array of information categories designed in the diagnostic process at its inception. As the consultant approaches a particular unit or group of the client system, he will necessarily see other aspects of what he feels are its functioning not represented in the diagnosis which he has in hand. Since he is dealing with a real client, in a real world situation, the temptation is well nigh irresistable to revise the diagnosis on the basis of his current observation. Yet, he is one observer observing at best a limited and time-bound behavior sample. To the extent that he makes such revisions he, therefore, very likely reduces both the reliability and the validity of the diagnosis with which he works. Said otherwise, he approaches each group, or each setting, as a unique instance with live people and real problems. Yet in many ways the diagnosis and treatment problem in organizational development is a "large N" problem. Were he to work

on the basis of the diagnostic data provided to him and that alone, given that it is reliable and valid, he would, across a large number of cases, succeed in a high portion (assuming that the diagnostic and prescription processes are themselves high in quality, reliable, and valid). Yet he does not ordinarily approach his role with that degree of objective detachment, and each time that he yields to the temptation to revise on the basis of "current reality" he submits himself to a situation in which his action steps are based on less than acceptably reliable and valid data.

Multiple Methods and Redundancy

A persuasive case is made in the literature for the use of multiple data collection and interpretation methods in the diagnosis. To the extent that questionnaire data may be supplemented by interview and even observational data and the same reality discerned, one may have a greater degree of confidence in the diagnosis that results. This, of course, increases the cost, but it may in many instances, if not most, be judged worth the investment.

Norms and Their Relevance

Diagnostic data, whether quantitative or narrative, are at best descriptive until they are compared to a standard. The standard, of course, may be the wording of the response categories of the original items. More useful, perhaps, is the use of norms in which the behavior or responses, typical of a group

or person like that being diagnosed, are established as a comparison standard. Lacking norms, one runs a real risk of classifying as "good" behavior which, in fact, is less than acceptable, and classifying as "bad" behavior which is really not so. In all instances in which norms are used, however, one should recall that the norm is, at best, a description of the typical behavior of a person or group like that currently being diagnosed; it does not necessarily reflect an ideal--nor perhaps even a desirable--state.

Presenting Diagnostic Data

Diagnostic data obtain their usefulness when they are presented to persons with critical roles in the treatment or development process. In some instances, diagnostic data are digested only by the consultant or change agent himself and represent only his notes to himself, perhaps on tape, perhaps in memo form, perhaps simply retained in his memory. More often than not, however, presentation of the diagnostic data is made throughout the client system with which subsequent work is to be done. In such instances, the diagnostic data may be presented in written form (that is, in the form of a diagnostic report or "workup"), orally (that is, talked through with the client system or its key members), or by some combination of multi-media methods, perhaps a narrated report accompanied by a written summary, graphic displays, and the like. A number of issues arise in such instances, many of them subject to substantial disagreement among practitioners.

Amount of Interpretation Provided

For some practitioners, interpretation provided by a consultant or diagnostic expert is felt best kept to a minimum. Again, as in the analytic process, the supposition is that client motivation toward constructive change is greater when client participation in the interpretative process is maximal. In such instances, diagnoses would tend to be presented as "bare facts" in perhaps tabular or graphic form or in simple anecdotal or descriptive terms. For others, however, interpretation drawing upon the best available skills of diagnostician, scientist, and practitioner, is owed to the client system.

Complexity Versus Simplicity

Whatever the degree of interpretation provided, there would appear to be reasonable agreement that the diagnosis in its presentation to the client system must be kept simple enough to be readily understood by its members. Far from representing a patronizing stance, this represents a sensible commitment to minimize or, if possible eliminate, professional jargon, to avoid ambiguous wording, and to make the interpretive points which are presented as simple, clear, and straightforward as possible.

Transduction

Throughout this process the consultant is a tranducer, that is, an information link between a body of knowledge and a user system. It is his task to convert the information which comes as it does from

outside of the organization's immediate repertoire to a form in which it can be freely circulated and digested inside the organization. This requires a relatively active stance on the consultant's part, yet not one which is overbearing, pretentious, or oppressive. Process skills are required, but more than process skill is necessary. Substance in the form of the diagnosis is entering the organization as a social system, and to the consultant falls the task of being certain that that entering information is put to constructive uses, and that maximal benefit is gained from it.

Breadth and Geographical Dispersion

When the organization is geographically widely dispersed more use necessarily must be made of written presentation forms. In such instances, some use may be made of verbal presentations carefully spotted in key locations, but it is to the written word, its clarity and efficiency that greatest reliance falls.

Speed

A diagnosis which consumes months in the construction may be elegant, yet useless, since much hinges upon the currency of the diagnosed situation. In general, the faster the diagnosis can be returned, the more relevant and urgent it will be to the client system and to its efforts to improve. No definite turnaround time guidelines can be given, and the time will necessarily be longer for more complex systems, yet a period of a few weeks seems the maximum duration that may be safely allowed in most organizations.

Summary of the Field

In the pages thus far we have reviewed the problem of diagnosis in general, the methods of collecting data, the methods of analyzing and integrating diagnostic data, and the methods of presenting the data so analyzed and interpreted back to the client system. To reiterate what has been stated thus far, a diagnosis requires a comprehensive analysis of the current state of the system, an analysis which precedes, and in part determines, a treatment from a possible array of treatments. It must be differential, it must be oriented primarily toward the client system's well-being, and it ought not be a simple benchmark, a map of pitfalls for the change agent or consultant, nor a simple earmarking of the style differences among existing consultants. Data may be collected by interview, questionnaire, observation, or from the operating records of the organization itself. The data, once collected, may be analyzed quantitatively or summarized in non-quantitative descriptive form. The picture which emerges may be presented in writing, a method which is especially useful for subsequent retrieval and for circulation to geographically dispersed locations; or it may be presented orally, or by some combination of methods. Throughout, however, the diagnostician and his consultant counterpart have the responsibility for bringing into the organization and its operating situation an adequately interpreted, reliable, valid, body of data which in relation to known principles of management differentially assess the current states of organizational functioning. It is this professional, differential, analytic procedure which constitutes a genuine diagnosis and which unfortunately is all too seldom provided in the organizational development world. In the present

instance, we have undertaken to build a system to provide an accurate differential diagnosis for organizations and their component subsystems. As such, it relies heavily upon the computer, analyses data from paper-and-pencil questionnaires in relation to stored data from the operating records of organizations, and hopefully provides data with considerable speed at an acceptable level of accuracy and detail. In the remainder of the report we will describe the background, the general scheme and the procedures for this diagnostic system.

TOWARD A COMPUTERIZED DIAGNOSTIC REPORT GENERATOR

The computerized diagnostic procedure proposed in the remainder of this report attempts to fullfill the requirements stated at the outset. It is reasonably comprehensive, in that it assesses the total functional state of the organization insofar as our research has identified the properties of that functional state. Furthermore, it is sufficiently flexible to permit the addition, removal, or substitution of component characteristics and their measures. Used with the Navy Human Resource Management Survey, with our own Survey of Organizations, or with similar and derivative instruments, it reflects an explanatory scheme (i.e., a set of management principles) that has emerged from years of rigorous research.

It assumes, as we feel a good diagnostic procedure should, that its output will precede and help determine different treatments selected to fit the states of functioning that it describes. Finally, it has been constructed with the thought in mind that the purpose in the end is the client system's (not the diagnostician's, not the consultant's) greater well-being.

It further assumes that data have been collected from all, or at least a generous representative sample, of the members of the client organization, and is designed with the paper-and-pencil questionnaire in mind as its data source. It relies extensively upon norms (that is, stored measures typical of various kinds of client groups).

The procedure to be described draws heavily upon a design first formulated in general terms more than five years ago by members of the Organizational Development Research Program staff. The broader design was given by us the acronym "CANOPUS*," standing for Computerized Analysis of Organizational Problems in User Systems and was viewed as containing both computerized diagnostic and computerized prescriptive elements. While the elements were thus identified relatively early in the history of the research Program, the need was not recognized as urgent until organizational efforts on a massive scale emerged as a real and present fact in the Navy's human resource and manpower programs. Because diagnostic capability was a clear need of the Human Goals effort, it was judged most appropriate to propose that the diagnostic elements be developed under a contract closely tied thereto. The prescriptive elements, on the other hand, appeared to us to involve applied research in the manpower area, as well as development, and were therefore proposed for funding under the Manpower R & D program. Both were approved for initial work. Each makes greatest sense in combination with the other. Yet it should be clearly understood that the contract under which this particular report is prepared is that which funds the diagnostic-descriptive segments of the overall system.

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*Origin of the acronym: Canopus has multiple referents. In celestial terms, it is one of the brightest stars, found in the Corina (keel) portion of the constellation Argo (Jason's ship). In ancient mythology, Argo could utter prophecies because it contained a piece of wood from the sacred oak tree. Conopus was also the pilot of Menelaus, and the city in Egypt where he was buried assumed his name. This city was famous for its representation of Osiris in the form of a vessel or jar, containing the vital organs of the human system.

CANOPUS - Its Design and Functions

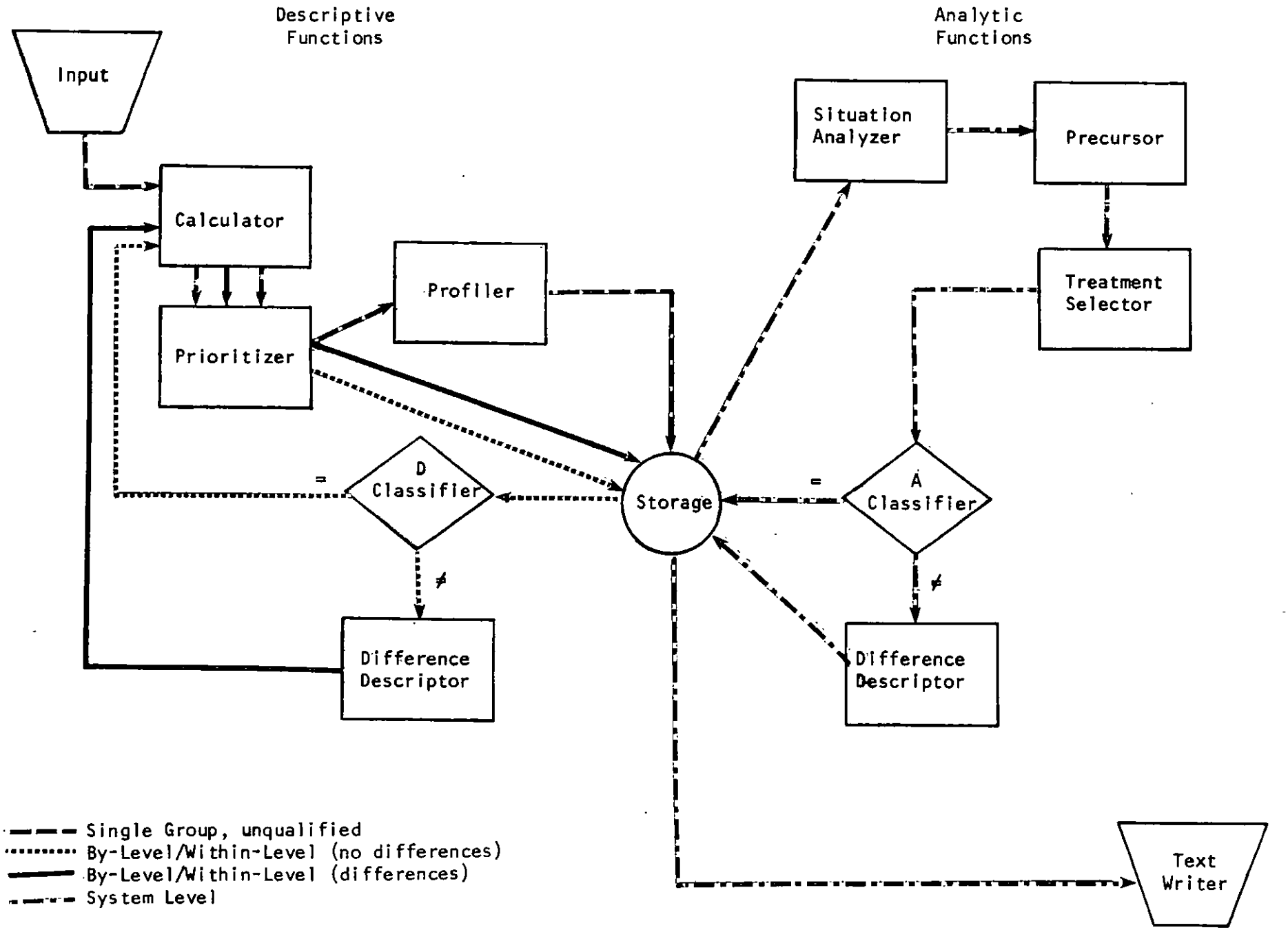
A functional layout of the CANOPUS Procedure, as it should ultimately develop, is presented in Figure 2. As this chart indicates, the entire sequence may be viewed as containing descriptive functions (those operations whose purpose is to generate summary statistics concerning existing conditions) and analytic functions (those operations whose purpose is to determine the reasons for, and recommended action steps to ameliorate, existing conditions). The components within these two broad functions, plus input, storage, and text-writing functions, form the basic steps of the procedure. Each is spelled out in somewhat greater detail in the paragraphs below:

INPUT - The input to the procedure are records containing the mean item and index scores of individuals in integral work groups in the organization. (A work group is defined as all persons who report immediately to a particular supervisor.)

CALCULATOR - Survey scores are relatively useless number sets until some comparison is made to a standard. Many such comparison standards are possible. Scores might, for example, be compared to the original wording of the response alternatives. If 75 per cent of the members of a group provide a "5" response and this alternative was worded "very satisfied," it conveys at least limited meaning. However, if most groups display 100 per cent in this "5" category and the group at hand does not, it means something quite different from what would be meant by comparison to a standard in which most groups show only 25 per cent as "very satisfied." Another approach

Figure 2

The CANOPUS System: Functional Components and Flow



would be to compare each group to the average of all groups in the particular organization surveyed. This also should be dismissed for some of the same reasons: no matter how excellent or atrocious the ship or shore station's record, half of the groups will be shown as comparatively "good" and half comparatively "bad." In the CANOPUS procedure we have opted for comparison to national (e.g., Navy-wide) norms representing a population of groups like the one in question (same level, same type of unit or function). The CALCULATOR component takes the group's mean score and converts it to a percentile score in the appropriate normative distribution.

PRIORITIZER - The percentile score is but one indicator of the seriousness of a particular problem or the contribution of a particular organizational strength. In simple terms, it indicates how low or how high the group stands in comparison to other, similar groups. Lacking any other information, both managers and consultants often assume that a high score (whether in raw or percentile form) indicates an area needing little or no attention. Conversely, a low score is, in itself, often interpreted as flagging a condition high on the priority list of matters demanding concern. Yet it may not be so. While, in general, the whole array of measures relates to effectiveness, for any particular group any single measure may have a low, not a high, impact upon satisfaction and performance. For this reason, it may often

occur that a measure of intermediate negativeness is more critical in its effect than is another, "worse" indicator. What this suggests is that the level of a survey measure must be prioritized for concern and attention in terms of its impact upon effectiveness. PRIORITIZER does this by weighting each measure in terms of its relationship to outcomes, as indicated by standard data in the normative array. The resulting predicted scores become the basis for prioritizing the percentile scores generated in the previous step.

PROFILER - From concurrent research under another contract, we have determined that a limited number of relatively "pure" types of groups exist in the Navy, as in civilian organizations. The findings (still in the report preparation stage) indicate furthermore that these types respond differentially to various action or development techniques. Both to generate additional diagnostic information for the group and its consultant and to provide one basis for treatment selection, it is necessary to match the group at hand to these stored profiles and identify the type with which it is most consistent. PROFILER makes this match, and by a set of preprogrammed decision rules, identifies the best-fit type for the group at hand.

D-CLASSIFIER - Descriptive data must be aggregated in some form if two requisite conditions are to be met: (a) a capability of grasping their meaning to the system, and (b) the

protection of confidentiality. D-Classifier initiates this process by deciding (according to pre-programmed rules) whether the groups in an entire level (e.g., groups under first-line supervision) of an organization or unit are homogeneous or heterogeneous in types identified by PROFILER. If the determination is that the groups are homogeneous, the entire array is looped back through CALCULATOR and PRIORITIZER to generate a whole-level reading similar to that for any group. On the other hand, if the determination is that they are different, the array is sent to D-DIFFERENCE DESCRIPTOR prior to its resubmission.

D-DIFFERENCE DESCRIPTOR - This component combines sub-sets of the array into type-homogeneous sets and submits each to CALCULATOR and PRIORITIZER for the generation of whole-set readings appropriate to the level. As a result, not one, but several composite readings are generated.

SITUATION ANALYZER - Description is but one phase of diagnosis; it provides the "what" of the situation. Why conditions occur is equally, if not more, important. Observable problems or deficiencies may, in theory, be caused by (a) constraining situations, (b) information deficiencies, (c) skill deficiencies, or (d) values conflicts. SITUATION ANALYZER examines the extent to which the first of these (constraining situation) is associated with diagnosed conditions. It does so by comparing conditions which would be predicted from our knowledge of constraints present in such things as the

group's organizational climate (and our knowledge of how this typically relates) with those conditions which actually exist. An absence of an appreciable difference between the actual and situation-predicted scores is viewed as evidence for substantial situational causation. The existence of an appreciable difference, on the other hand, is seen as reducing the plausibility of situational causation.

PRECURSOR - Once the effects of situational constraints are eliminated, attention necessarily turns to the other three categories (information deficiencies, skill deficiencies, and values conflicts) as potential causes of observed problems. Information regarding the degree to which each of these obtains in any current instance must come from sources largely external to the Human Resources Management Survey. Assuming that it is available and has been entered, however, PRECURSOR examines the extent to which diagnosed conditions (represented by residual scores from the SITUATION ANALYZER component) may be attributed to a lack of information, to a lack of skill, or to a conflict in values.

TREATMENT SELECTOR - From the knowledge bank underlying the earlier PROFILER component, and from stored history as it gradually accumulates, the results thus far form the basis for selecting one or more recommended action steps which have the highest probability of success.

A-CLASSIFIER - Although each group's results are ultimately printed out separately (presumably for the use by members and their supervisor), there remains a necessity of aggregating causal patterns and recommended action steps across whole levels of the organization. Both busy schedules and the requirements of action-planning make this step advisable. A-CLASSIFIER performs a function similar to D-CLASSIFIER, in that it decides (by pre-programmed rules) whether causal patterns and action recommendations are homogeneous or heterogeneous for groups within the level. If homogeneous, the results are transmitted to storage for ultimate printout. If heterogeneous, they move to A-DIFFERENCE DESCRIPTOR prior to going to storage.

A-DIFFERENCE DESCRIPTOR - By pre-programmed rules, this component combines sub-sets of groups within the level whose causal and action statements seem similar. It then transmits its results to storage.

STORAGE - As its name implies, this component serves as the in-process repository for original and processed data. All of the necessary results (for each group and level) flow from it to the final component in the process.

TEXT WRITER - Here are stored phrases, statements, and paragraphs germane to each of the condition-sets which may result. From the information transmitted to it from STORAGE, TEXT WRITER prints out a narrative statement for each group,

and for the system concerning its levels and overall functioning. Included are prioritized percentile scores, causal conditions, and recommended action steps.

The remainder of the main segment of this report will discuss the role played in this procedure by the norm matrix, will present questions which may have arisen in the reader's mind and hopefully answer them, and will end with a discussion of steps that remain to be taken.

The Norm Matrix

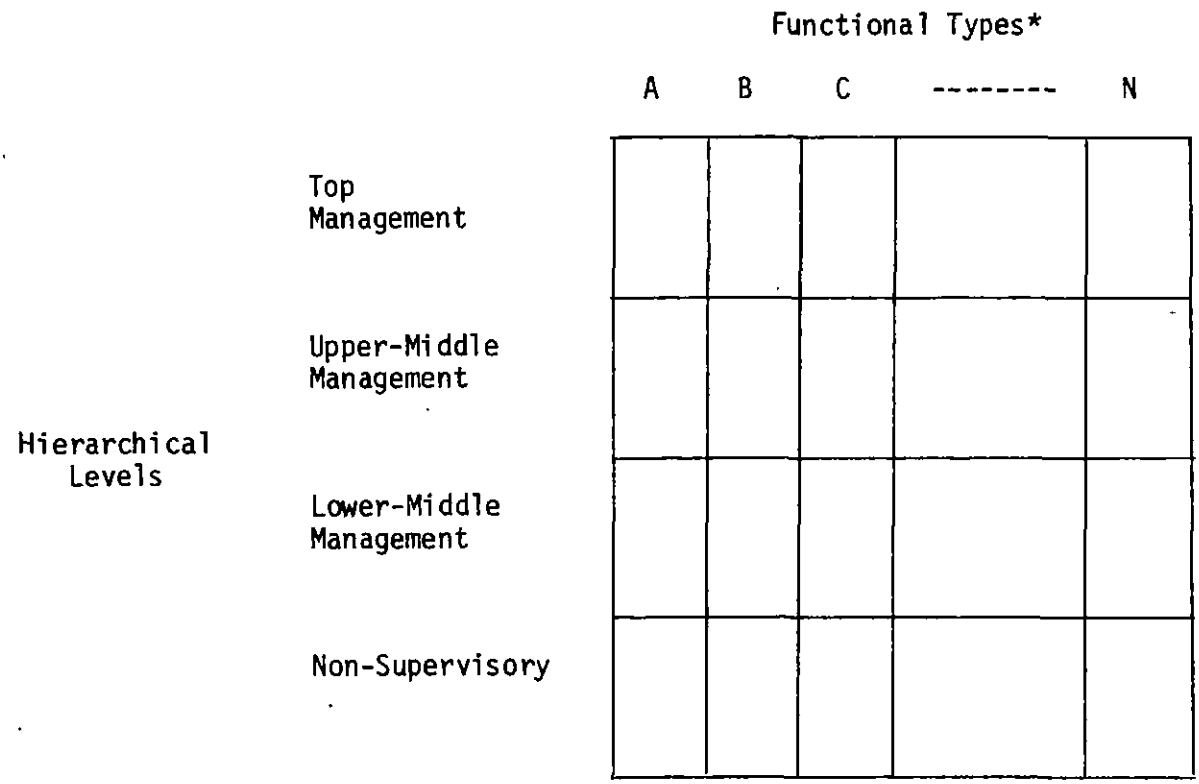
As an earlier section of the report stated, any set of measures, to be diagnostically useful, must be compared to some standard. A number are possible; in this instance we have elected to use normative data--i.e., stored data descriptive of a number of possible, "typical" client units--as the comparison standard.

Normative data are difficult to obtain, ordinarily accumulating in proportion to the frequency with which an instrument is used, the size of the client system and its coverage with the survey, and the like. Within any given body of normative data, some trade-off must be made between the usefulness which accrues from cross-cutting it into increasingly specific sets (e.g., all E-6's aboard destroyers) and numbers of cases (which decline in each set as the number of sets increases).

In this proposed procedure we have opted for an intermediate degree of stratification, one which we feel probably meets the needs of most organizational development practitioners and their client units. It is shown graphically in Figure 3.

Figure 3

The Norm Matrix



*Functional types may be distinguished on any convenient basis. Thus, for the Navy, it might consist of types of ships and shore-stations.

On the vertical axis are indicated rows representing level of the organization at which any group might fall. The basis for thus providing different norms for different levels is twofold:

(a) Extensive research shows that conditions simply are naturally "better" up the line than down below. In part, this reflects the fact that more capable persons are selected for advancement in any organization. In part, it also reflects the greater latitude and command of resources that exists at higher levels. Regardless of the causes, the condition makes it evident that it is in some degree inaccurate to compare groups to a common standard.

(b) Research findings, reported elsewhere, make it clear that, in the Navy, the quality of organizational practices which one experiences rises directly with the reporting level of one's group (Franklin, 1974).

The horizontal axis indicates functional distinctions. This refers to a differentiation among "kinds" of units--ship types, types of shore stations, and the like. Previous research has indicated that, in the Navy, ships and shore stations are substantially different from one another and that ship types are similarly quite varied. We anticipate that, for any organization like the Navy, it will be desirable to make the normative comparisons function-specific.

Within any cell of the norm matrix are stored two kinds of information useful to the diagnostic process:

(a) the normative values themselves, in the form of survey index values and their coordinate percentile equivalents;

(b) regression coefficients between each survey measure as a predictor variable and outcome measures appropriate to a unit representative of that cell.

As an accumulated, stored history indicates a need for revision, both the percentile values and the relationship of each measure to outcome variables (e.g., satisfaction, retention, health, or operating performance) may be modified to make them more current. Furthermore, since the procedure relies upon stored values typical of the cell, any values may be inserted, thus providing the potential for simulation studies to aid personnel policy-makers.

The judgment concerning how frequently to revise and update norms is arbitrary and the criteria necessarily somewhat vague. It must be sufficiently frequent to keep the normative array current, yet not so frequent as to disrupt the ability to make progress comparisons. Of course, as the array becomes larger, the addition of any new increment has less impact upon the stored values. As an arbitrary rule, perhaps a frequency of once per year might be considered an optimal interval at the outset.

Issues and Answers

Finally, there are certain issues and questions which doubtless have occurred to the reader which ought be addressed. They are posed below in the form of questions, followed by brief responses.

What measures form the basis for the diagnosis?

Although any measures having the same format could be used, in the present instance the procedure uses the items and indices from the Navy Human Resource Management Survey (or its civilian antecedent, the ISR Survey of Organizations). Thus the measures tap organizational (command) climate, supervisory leadership behavior, subordinate peer behavior, emergent group processes, and outcome measures, as well as special purpose measures in a number of areas.

What is the analysis unit for diagnostic purposes?

The face-to-face work group (defined as the immediate subordinates of a supervisor) is the analytic unit, since a considerable amount of research has indicated that groups, rather than individuals, are the basic building blocks of organizations. In this vein, the procedure uses the group mean score as indicative of the perception of the "average" or "typical" group member, and it is this measure for which a percentile score is generated.

What cause-and-effect assumptions are made in this procedure?

It assumes that the organization is an open social system, in which nothing really "exists" but the behavior of its members. These behaviors combine to form characteristics (called "emergent properties") that are different from (or perhaps greater or less than) the sum of the component

behaviors. Thus, group processes are seen as characteristics, above and beyond the behaviors of group members, which emerge from those behaviors. Organizational climate is similarly an emergent characteristic, resulting from the group processes of numerous groups and affecting (as a situational constraint) the functioning of some other group. Perhaps the most familiar emergent property of any group is its performance. Evidence reinforcing the validity of this sequence in both civilian and Navy settings has been provided in several recent technical reports (Franklin, 1973, 1974). Behaviors, themselves, are seen as caused by any of four kinds of factors: information, skill, values, and the situation. These antecedent characteristics are termed "precursors" and a comprehension of them is seen as adding to the diagnostician's ability to understand why behavior of a particular form occurs. (Bowers, Franklin and Pecorella, 1973).

Are the measures stored in the norm matrix taken from this group itself, or from some other source?

By definition, normative data are those presumed to be representative of a whole population or sub-population. Therefore, each cell of the norm matrix contains, at any given time, all of the data thus far collected from persons in groups identified as belonging to the cell. Unless previous waves of collected data have been entered into the matrix and the present group was previously surveyed, none of the data in the cell will have come from the group at hand.

Similarly, the relationships to outcomes (regression coefficients) stored in the cells of the matrix are those found to be typical for groups of this kind. Of course, in using the procedure, a large organization will want to accumulate its own values and coefficients from large numbers of its own groups. These values and coefficients will then serve the necessary normative functions.

Why must norms be external to the unit being diagnosed?

As the text indicates, "internal" comparisons--i.e., comparisons of each group to the average of groups in its own unit--forces half to be "bad," half to be "good," and can be quite misleading. Of course, the same situation occurs in theory when comparison is made to national norms: half of the national array is portrayed as good, half bad. Yet the difficulty declines in direct proportion to the breadth of the array. A group, aboard a destroyer, which is compared to the average group aboard that destroyer only, runs maximum risk of comparative distortion. When compared to all such groups aboard all destroyers, the distortion is vastly reduced.

What Has Been Accomplished and What Remains To Be Done

Of the components viewed at the outset as suitable for immediate work, two are presented in the appendices to this report as substantially complete (CALCULATOR and PRIORITIZER). Appendix A presents a general

description of the software contained in these two components, together with a copy of the computer program itself. Appendix B presents sample output from the two components.

Of the components which remain, some are viewed as relatively simple and straightforward, whereas others (such as SITUATION ANALYZER) are deemed more complex. In the months which remain, our effort will be directed toward these remaining steps, especially toward the more complex ones.

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Appendix A

Description and Computer Program for
the Calculator and Prioritizer Functions

PNORM

GENERAL DESCRIPTION

PNORM performs two basic functions utilizing data from two data sets, identified as MASTER NORMS and SITE NORMS. These functions are:

A. Percentile score construction and scanning for the SITE NORMS data based on (A1) MASTER NORMS deciles (A2) deciles computed from the SITE NORMS data set alone or (A3) deciles computed using a data set at some prior time.

B. Ranked predicted criterion score construction and scanning. Predicted criterion scores are constructed by a simple regression model relating functional measures to criterion, either using (B1) MASTER NORMS to establish regression coefficients and deciles for application to SITE NORMS or (B2) using SITE NORMS alone, or (B3) applying a set of regression coefficients and deciles computed using a data set at some prior time.

FUNCTION A. There are three "modes" in which function A. can be executed, A1, A2 and A3. A1 assumes that a MASTER NORMS data set is used currently to establish deciles for the SITE NORMS data, A2 assumes the SITE NORMS will be used to generate its own decile sets and A3 assumes that deciles have been computed by a prior computer run.

MODE A1. Here the MASTER NORMS data set is read and aggregated into groups ordered by stratum (see keywords (GVAR, SVAR) and deciles computed in STRATUM/VARIABLE order. They are written using unformatted FORTRAN on the permanent disk file FT04F001. Next, the SITE NORMS data set is read, aggregated and sorted into the same STRATUM/GROUP set and the MASTER NORMS deciles used to convert the aggregated data into percentile scores. These percentile scores are then scanned for "outlying" variables within groups defined by keywords PMIN, PMAX and the outliers are printed for each group. Keywords MASTER, NORM and INFI are used in this mode..

MODE A2. This is the same as A1 except that the SITE NORMS data set is used to compute its own deciles, rather than using those from a MASTER NORMS data set. The aggregation, sorting, percentizing and scanning remains the same. Keywords NOMA and INFI are relevant here.

MODE A3. Here the procedure is the same as in A1 except that the MASTER NORMS data set has been used at some prior point in time and only the decile sets (residing in permanent disk FY04F001) are used. Again the aggregation, sorting, percentizing and scanning is the same. Keywords NORM and INFI are relevant.

FUNCTION B. This function can again be implemented through three alternative modes, depending on whether the MASTER NORMS data set is used currently, or was used in a prior computer job, to estimate the regression coefficients.

MODE B1. In the first mode, the MASTER NORMS data set is used to generate a set of simple regression coefficients between the functional measures and a criterion variable. Since all variables must be in standard score form (i.e., means of zero and standard deviation of one) in all three modes, these "Beta" coefficients are identical to the Pearson's r's between the same pairs of variables. If the data are not in standard score form, the keyword STAN must be used to standardize the variables internal to the PNORM program prior to the regression calculations. The obtained regression coefficients are then applied to the SITE NORMS data in a second job step to produce a set of PREDICTED CRITERION SCORES. These PREDICTED CRITERION SCORES are then scanned for outliers in the same manner as in function A above. MODE 1 is obtained by indicating the keywords PREDICTION and MASTER on the parameter card.

MODE B2. In the second mode everything is as above, except that only the SITE NORMS data set is used. First, simple regression coefficients are computed, again using the functional measures as predictors and the criteria as dependent variables. Now, however, the predicted criterion scores are arrived at using the same SITE NORMS functional measures as predictors. Keywords PRED and NOMA are invoked to implement this mode.

MODE B3. The third mode assumes that regression coefficients and deciles have been calculated by a prior procedure using a relevant data set and have been placed in the permanent disk data set defined by DSRN IN. These coefficients are read by the program and then applied against functional measures from the SITE NORMS data set to generate predicted criterion scores. Keywords PRED and REGR are used for this mode.

Input Input to the program consists of an OSIRIS data set and control cards.

Output The output consists of the program printout, and sets of simple regression coefficients in DSRN IN (if the PREDICTED CRITERION SCORE mode is chosen).

STANDARD OSIRIS FEATURES

Case and variable selection. The OSIRIS standard global filter option is available to select a subset of cases from the input data. In addition, the keyword parameter BADDATA allows the user to skip cases having "BAD" values (e.g., blanks or special characters).

Transforming data. OSIRIS Recode statements in decimal mode may be used with the program. (See ref. 1 in Appendix B of the OSIRIS Manual)

Missing data. The keyword parameter MDATA=(NONE, MD1, MD2, BOTH) allows the user to exclude either MD1, MD2 or both "missing data" values. (See global parameters)

PRINTED OUTPUT

The major components of the printout are specified below.

For Function A:

A. Interpretation of control cards and listing of input dictionary. All options are given program interpretation and the input dictionary (comprised of the GROUP variable, STRATA variable, and all NORM variables) is printed.

B. Aggregated Data Matrix. A matrix whose rows are groups and columns norm variables is printed. The elements represent mean values for all cases in the data set having the particular group.

C. Decile Printout. (Optional) A matrix of data for each strata is printed giving the deciles for each variable based on the mean values for all groups within the particular strata.

D. Percentized Matrix. A matrix of data corresponding to the aggregated data matrix whose values are percentile scores associated with the aggregated data matrix.

E. Norm Extremes. A listing of extreme NORM or CRITERION scores for each group determined by the MAXP, MINP keyword parameters. The output has the following format:

```
                *** LISTING OF NORM EXTREMES BY GROUP
                    RANK ORDERING BY PERCENTILE MAGNITUDE

                *** STRATA NO. xxx  GROUP NO. xxx   SAMPLE SIZE = xxxx
One set         *** HIGH NORMS
for                 VARIABLE NUMBER                 PERCENTILE
each                      ⎱                              ⎱
group           *** LOW NORMS
                    VARIABLE NUMBER                 PERCENTILE
                          ⎱                              ⎱
```

etc., where the variable numbers within the HIGH NORM and LOW NORM sets are printed by ascending percentile order.

All the previous printout is listed once for the MASTER NORMS data set and again for the SITE NORMS data set, subject to the DECILE/NODECILE keyword, allowing decile printout expression on either or both data sets.

For Function B:

All of the above A-E components are printed. However, the DECILE printout gives the deciles for each group across all variables rather than by variable across all groups in a strata as in Function A. The PERCENTIZED MATRIX, it is reminded, has been computed using the ordering of the predicted criterion scores for each group. In addition, the following two matrices are printed (after B. - Aggregated Data Matrix).

I. Standardized Data Matrix. The matrix of aggregated data transformed (by variable within strata) to standard scores, i.e., STD. SCORE=(SCORE-MEAN)/STD. DEV.

II. Predicted Criterion Matrix. Matrix giving the results of applying the simple regression coefficients to the standardized data (B1.). The percentized predicted criterion score matrix is scanned in the same manner and has the same output format as described for Function A. (printout E.) above.

INPUT OSIRIS DATA SET

Data must be input in the form of an OSIRIS data set, type 1 or type 3. A maximum of 202 variables, including the group variable, strata variable and all norm variables may be used in a run. A maximum of 220 variables total (i.e., including recode type variables) may be used.

RESTRICTIONS

1. Maximum number of groups is 300.
2. Maximum number of strata is 100.
3. Maximum number of NORM variables is 200.
4. Maximum total number of variables is 220. (Includes group, strata, norm and recode variables.)
5. Each group must have a unique stratum associated with it.

6. The strata variable for the SITE NORMS data set must have codes that match the MASTER NORMS codes exactly. (The 1st stratum code decile set is used to percentize the aggregated data for the 1st SITE NORMS data set stratum, the 2nd stratum code decile set is used to percentize the aggregated data for the 2nd SITE NORMS data set stratum,..., etc.)

7. No limit on number of cases.

8. Maximum number of groups within one stratum is 100.

TEMPORARY DISK STORAGE

There are three temporary disk data sets used by the PNORM program. They are referred to symbolically as ITEMP, ISAVE and IN in SUBROUTINE INPUT and are presently assigned DSNR's 3, 4 and 7, respectively. The functions of these data sets is as follows:

ITEMP is used in SUBROUTINE SORT to hold a complete copy of the fullword input data and uses unformated FORTRAN Read/Write statements. Thus, the amount of space required is N*NV*4 bytes, where N is the number of cases passing the filter, missing data and bad data checks and NV is the number NORM variables plus three.

ISAVE is used to store the deciles generated by the MASTER data set job step. Writing is done in SUBROUTINE PCENT and the deciles are read back in and used for percentizing the SITE NORMS data in SUBROUTINE MACHO. Space required is NV*NS*44 bytes where NS is the number of strata.

IN is used to read regression coefficients set up prior to the running of a PREDICTED CRITERION SCORE job step. Since there must be one regression coefficient for each criterion variable for each strata, the space requirement is NV*NS*4 bytes.

Both ISAVE and IN are also used with unformated FORTRAN READ/WRITE.

EXECUTING THE PROGRAM

The Job Control Language, monitor control cards and program control cards needed to execute PNORM are outlined below. Cards must be supplied in the indicated order. Refer to Appendix A of the OSIR's Manual for details on the OSIRIS Monitor and its catalogued procedure and Appendix E of the OSIRIS Manual for assistance with JCL. The 'xxxx' in the ddnames that follow are determined by the parameter INFILE.

```
//    EXEC     OSIRIS
//DICTxxxx  DD    Describe the input dictionary
                  (Omit this DD card if $DICT is used.)
//DATAxxxx  DD    Describe the input data file.
                  (Omit this DD card if $DATA is used.)
//SETUP  DD  *

$RUN PNORM

$RECODE (Optional)
     Recode statements

$SETUP
     1.  Global filter.  (Optional)
     2.  Label card.
     3.  Global parameters.
     4.  Variable list.

$DICT (Optional)
     Dictionary cards.

$DATA (Optional)
     Data cards.

/*
```

PROGRAM CONTROL CARDS

Refer to Appendix C of the OSIRIS Manual for detailed descriptions of the standard OSIRIS program control cards, items 1-4 below.

1. Global filter. (Optional) Selects a subset of cases to be used in the runs.

   Example: INCLUDE V25=2-9*

2. Label card. One card containing up to 80 characters to label the printed output.

   Example: PNORM RUN FOR MALES ONLY

3. Global parameters. Parameters are chosen from thosedescribed below, must be separated by blanks and/or commas, and must be terminated with an asterisk. Defaults are underlined.

   Example: GVAR=1, SVAR=2 DECILES*

SVAR=variable number	The variable number to be used as the stratum variable.
GVAR=variable number	The variable number to be used as the group variable.

PMAX=60/I — The maximum percentile value used for scanning of the percentized matrix.

PMIN=40/I — The minimum percentile value used for scanning of the percentized matrix.

NOSORT/SORT — Whether or not the input data has to be sorted. (If sorted the data must be ordered first by the SVAR variable, then by the GVAR variable.

INFI=IN/xxxx — Input data ddname suffix.

NODE/DECI — Whether or not deciles for each variable within each stratum should be computed and printed.

BADDATA=STOP/SKIP/MDI/MD2 — When non-numeric characters (including imbedded blanks, &'s, and -'s and all-blank fields) are found in numeric variables, the program should:

STOP: Terminate the run.
SKIP: Skip the case.
MD1: Recode a full field of & to a full field of nines plus 1 (i.e., recode & to 10, && to 100, etc.). Recode a full field of - to a full field of nines plus 2 (i.e., recode 1 to 11, -- to 101, etc.). Recode all other non-numeric values to the first missing data code.

MD2: Recode full fields of & and - as specified in MD1 above. Recode all other non-numeric values to the second missing data code.

For SKIP, MD1, and MD2 a message is printed about the number of cases so treated.

MDATA=BOTH/MD1MD2/NONE — Eliminate cases from the analysis that have MD1, MD2, either (BOTH) missing-data values on any variables from the analysis. If missing-data is to be included NONE should be chosen.

NOPRED/PRED — Whether the RANKED PREDICTED CRITERION score mode is chosen.

MAST/NOMA/NORM	Indicates the input mode for the PERCENTILE SCORE CONSTRUCTION/SCANNING option. MAST indicates that the input data used in this job step is the MASTER NORMS data and that the following job step will use a NEW NORMS data set as input,' have the keyword NORM and be percentized according to the deciles established using the MASTER NORMS. NOMA means that the current job step has data that will be percentized according to its own deciles and not used to establish deciles for data from any subsequent job step. NORM indicates that a MASTER NORMS data set has already been used to generate deciles to be used for this step. The deciles are assumed to be stored on DSRN defined by ISAVE.
NORE/REGR	For the PREDICTED CRITERION SCORE (PRED keyword) mode only. REGR indicates that the simple regression coefficients have been calculated in a prior run and are stored in DSRN IN, arranged in strata/variable list order. NORE, the default, indicates that the simple regression coefficients are to be calculated.
NOST/STAN	For the PREDICTED CRITERION SCORE (PRED keyword) mode only. The keyword STAN indicates that the data will be standardized by the program before the regression coefficients are computed. NOST indicates that they will not be standardized by the program.

As an example of the use of these keywords, consider the following three job steps:

```
//    EXEC  OSIRIS
//DICTIN  DD  DSN=MASTERDI
//DATAIN  DD  DSN=MASTERDA
//DICTINA DD  DSN=NEWDI
//DATAINA DD  DSN=NEWDA
//DICTINB DD  DSN=DICT
```

```
//DATAINB  DD   DSN=DATA
//SETUP    DD   *
$RUN PNORM
$RECODE
   {     (Recode Statements)
$SETUP
INCLUDE V1=1 *
(1)  MASTER NORMS DATA (MALES ONLY)
SVAR=2  GVAR=3  *
V4-V10   *
$END

$RUN PNORM
INCLUDE V1=1  *
(2)  NEW NORMS DATA (MALES ONLY)
SVAR=2  GVAR=3  NORM  INFI=A  *
V4-V10  *
$END

$RUN PNORM
EXCLUDE V20=2  *
(3)  PERCENTIZING RUN ON NON-BLACKS (V
SVAR=1   GVAR=2  NOMA  INFI=B  *
V3-V10  *
/*
```

In job step (1) the data sets MASTERDI and MASTERDA are used as MASTER NORMS data. After being filtered to include males only (INCLUDE V1=1 *), they are used to construct deciles for use in job step (2). Here the data sets NEWDI and NEWDA, assigned through the keyword INFI=A, are used as the NEW NORMS dictionary and data and percentized according to deciles established in job step (1).* In job step (3), the data sets DICT and DATA, assigned through the keyword INFI=B, are used to generate a percentized matrix, for the same data, as final output. A filter to include non-blacks (EXCLUDE V20=2*), is also used.

4. Variable List. Contains all norm variables. Also if the predicted criterion function is used and the SITE NORMS data is not being used, then the last variable indicated is used as the criterion variable in regression coeff. calculations.

---

*It should be remarked that there is a small amount of linear interpolation error associated with this procedure. Tests using the same data, a MASTER NORMS data set with 480 cases and a SITE NORMS data set of 125 cases on 3 NORM variables indicate errors of less than .01-.02 for the percentized matrix. An accuracy improvement for this procedure would be to use percentiles instead of deciles. Because of the additional CPU involved and the marginal accuracy improvement potential, deciles are presently used.

CREDITS

This program was originally designed by Robert C. Messenger of the Survey Research Center Computer Support Group (S.R.C.C.S.G.) and Mauricio Font of the Center for Research on the Utilization of Scientific Knowledge (C.R.U.S.K.), ISR, May, 1974. The program was written by Robert C. Messenger (S.R.C.C.S.G.). It uses standard OSIRIS input/output/sorting routines, developed and maintained by S.R.C.C.S.G., under the direction of Neal Van Eck (see ref. 2).

REFERENCES

1. "OSIRIS III: An Integrated Collection of Computer Programs for the Management and Analysis of Social Science Data," Institute for Social Research, University of Michigan, Ann Arbor, Michigan, 1973.

2. OSIRIS III Subroutine Manual, Institute for Social Research, The University of Michigan, Ann Arbor, Michigan, 1973.

JOB NO. 693490 UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL CTI24) 20:51.23 TUE OCT 15/74

TTTTTTTTTTTTTTTTTTTTTTTT SSSSSSSSS
TTTTTTTTTTTTTTTTTTTTTTTT SSSSSSSSSSSSS
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TTTTT SSSSSSSSS

SSSSSSSSS DDDDDDDDD HH HH TTTTTTTTTTTT
SSSSSSSSSSS DDDDDDDDDD HH HH TTTTTTTTTTTT
SS SS DD DD HH HH TT
SS DD DD HH HH TT
SSS DD DD HH HH TT
SSSSSSSSS. DD DD HHHHHHHHHHHH TT
SSSSSSSSS DD DD HHHHHHHHHHHH TT
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SS DD DD HH HH TT
SS SS DD DD HH HH TT
SSSSSSSSSSS DDDDDDDDD HH HH TT
SSSSSSSSS DDDDDDDDD HH HH TT

```
0001            SUBROUTINE INPUT                                                1.000
                C                                                               2.000
                C                                                               3.000
                C                                                               4.000
                C   *** MAIN PROGRAM                                            5.000
                C   *** READS CONTROL CARDS, INPUT DICTIONARY, DATA AND AGGREGATES BY   6.000
                C   ***  GROUP                                                   7.000
                C   *** DICTIONARY AND CONTROL CARD INTERPRETATION IS PRINTED    8.000
                C   *** AGGREGATED MATRIX STORED IN ADATA (REAL*4) ARRAY         9.000
                C   *** CALLS SORT, CARDS, SCALE, PTILE, PTILE1, TEXT, GPIN AND  10.000
                C   ***  SETKEY                                                  11.000
                C                                                               12.000
                C                                                               13.000
                C                                                               14.000
0002            DIMENSION KEYLS(100),IVAL(15),ILOC(15)                          15.000
0003            DIMENSION LABEL(20),V(220),ADATA(200,300),                      16.000
                * VM1(220),VM2(220)                                             17.000
0004            DIMENSION KAM(6)                                                18.000
0005            INTEGER IS(300),IDG(300),IDS(300)                               19.000
0006            INTEGER*2 LIST(220)                                             20.000
0007            INTEGER CD,GMAX,SMAX,BLK                                        21.000
0008            DATA CD/'IN  '/,BLK/'    '/,                                    22.000
                *   IDG/300*0/,IDS/300*0/                                       23.000
0009            DATA KEYLS/4,'GVAR',1,0,4,'SVAR',1,0,4,'FMAX',1,60,4,'FMIN',1,40,2  24.000
                1,2,'NOSO',0,'SORT',1,2,2,'NOPR',0,'PRED',1,2,2,'NOCE',0,'DECI',1,  24.000
                * 2,3,'MAST',1,'NOAA',0,'NORM',2,1,'IMPI',4,3,'FADD',4,             25.000
                * 'STOP',1,'MO1 ',3,'MO2 ',5,'SKIP',7,3,'MCAT',4,                   26.000
                * 'BOTH',0,'MO1 ',1,'MO2 ',2,'NONE',3,2,2,'NORE',0,'REGR',1,       27.000
                * 2,2,'NOST',0,'STAN',1,6,'PRIN',1,'STAN'/                          28.000
0010            COMMON/IO/IN,ITEMP,IPRTR,ISAVE                                  29.000
0011            COMMON/PARMS/IGROUP,ISTAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPRIN,IFMAST  30.000
                1,                                                              30.000
                # IBAR,VC,IFREQR,IFSTAN,IFPS                                    31.000
0012            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                32.000
                C                                                               33.000
                C                                                               34.000
0013            RECARD=0                                                        35.000
0014            GO TO 100                                                       36.000
                C                                                               37.000
                C   ENTRY FROM ISFSYS                                          38.000
                C                                                               39.000
0015            ENTRY ISFSYS(REC)                                               40.000
0016            RECARD=REC                                                      41.000
0017     100    CALL ISFSET                                                     42.000
                C                                                               43.000
                C   DEFINE I/O UNITS                                            44.000
                C                                                               45.000
0018            IN=7                                                            46.000
0019            ITEMP=2                                                         47.000
0020            ISAVE=4                                                         48.000
0021            IPRTR=6                                                         49.000
0022            WRITE(IPRTR,1100)                                               49.250
0023     1100 FORMAT(1H1,' PROGRAM NORM  OCTOBER 1974')                         49.500
                C                                                               50.000
                C   INITIALIZE                                                  51.000
```

```
                C                                                               52.000
0024                    N=0                                                     53.000
0025                    NMC1 = 0                                                54.000
0026                    NMC2 = 0                                                55.000
0027                    DO 13 I=1,203                                           56.000
0029                    DO 13 J=1,300                                           57.000
0029            13      ACATA(I,J) = 0.0                                        58.000
0030                    NG=0                                                    59.000
0031                    NS=0                                                    60.000
                C                                                               61.000
                C   FILTER                                                      62.000
                C                                                               63.000
0032                    CALL GFILT (LABEL,0)                                    64.000
                C                                                               65.000
0033                    WRITE (IPRTR,10)                                        66.000
0034            10      FORMAT ('0',20A4)                                       67.000
                C                                                               68.000
                C   KEYWORD PARAMETERS                                          69.000
                C                                                               70.000
0035                    NKEY=13                                                 71.000
0036                    CALL SETKEY (KEYLS,ILOC,NKEY,0)                         72.000
0037                    CALL GETKEY (IVAL,ISTR,6200,6200)                       73.000
0038                    IGRCLP=IVAL(1)                                          74.000
0039                    ISTRAT=IVAL(2)                                          75.000
0040                    IPMAX=IVAL(3)                                           76.000
0041                    IPMIN=IVAL(4)                                           77.000
0042                    IFSORT=IVAL(5)                                          78.000
0043                    IFPRED =IVAL(6)                                         79.000
0044                    IFPRIN = IVAL(7)                                        80.000
0045                    IFMAST = IVAL(9)                                        81.000
0046                    IRAD = IVAL(10)                                         82.000
0047                    MD = IVAL(11)                                           83.000
0048                    IFREGR = IVAL(12)                                       84.000
0049                    IFSTAN = IVAL(13)                                       85.000
0050                    IFPS = IVAL(14)                                         85.250
0051                    IF(ISTR.NE.FILK) DD = ISTR                              86.000
                C                                                               87.000
                C                                                               88.000
0052                    NV=ILIST(LIST)                                          94.000
0053                    LIST(NV+1) = ISTRAT                                     95.000
0054                    LIST(NV+2) = IGRCLP                                     96.000
0055                    NVT=NV+2                                                97.000
0056                    CALL GETDIC (DD,C,ITYPE,ISVN,IEVN,LIST,NVT,V,IRAD,      98.000
                       *    VMC1,VMC2,RECADD,220)                               99.000
                C                                                               100.000
0057                    INDS = NV + 1                                           101.000
0058                    INDG = NV + 2                                           102.000
0059                    CALL GNAME(INDS,NAM)                                    103.000
                C   PARAMETERS                                                  104.000
                C                                                               105.000
0060                    WRITE(IPRTR,40) NAM,ISTRAT                              106.000
0061            40      FORMAT(1H1,'*** PARAMETER SPECIFICATION',///,           107.000
                       * ' STRATA VARIABLE IS :',5X,6A4,5X,'VARIABLE NO.',I5)  108.000
0062                    CALL GNAME(INDG,NAM)                                    109.000
0063                    WRITE(IPRTR,60) NAM,IGRCLP                              110.000
```

```
0064      60    FORMAT(1H ,' GROUP VARIABLE IS :',5X,6A4,5X,                  111.000
                * 'VARIABLE NO.',I5)                                          112.000
0065            WRITE(IPRTR,70) IPMIN,IPMAX                                   113.000
0066      70    FORMAT(1H ,' MINIMUM PERCENTILE IS THE',I3,'TH',//,           114.000
                * '  MAXIMUM PERCENTILE IS THE',I3,'TH')                      115.000
0067            IF(IFSORT.NE.0) WRITE(IPRTR,110)                              116.000
0068     110 FORMAT(1H ,' DATA HAS BEEN PRE-SORTED , FIRST BY STRATA , THEN GRO  117.000
                1UP')                                                         117.000
0069            IF(IFPRIN.NE.0) WRITE(IPRTR,120)                              118.000
0070      120   FORMAT(1H ,' DECILE PRINT-OUT REQUESTED')                     119.000
0071            IF(IFPRED.NE.0) WRITE(IPRTR,130)                              120.000
0072      130   FORMAT(1H ,' PREDICTED CRITERION SCORE MODE')                 121.000
0073            IF(IFPRED.EQ.0) WRITE(IPRTR,140)                              122.000
0074      140   FORMAT(1H ,' PERCENTILED NORMS MODE')                         123.000
0075            IF(IFMAST.EQ.0) WRITE(IPRTR,150)                              124.000
0076      150   FORMAT(1H ,' NO-MASTER DATA STRUCTURE')                       125.000
0077            IF(IFMAST.EQ.1) WRITE(IPRTR,160)                              126.000
0078      160   FORMAT(1H ,' MASTER DATA SET')                                127.000
0079            IF(IFMAST.EQ.2)WRITE(IPRTR,170)                               128.000
0080      170   FORMAT(1H ,' NORM DATA SET')                                  129.000
0081            IF(IFAD.EQ.1) WRITE(IPRTR,270)                                130.000
0082            IF(IFAD.EQ.3) WRITE(IPRTR,210)                                131.000
0083            IF(IFAD.EQ.5) WRITE(IPRTR,220)                                132.000
0084            IF(IFAD.EQ.7) WRITE(IPRTR,230)                                133.000
0085      270   FORMAT(1H ,' BAD DATA WILL TERMINATE RUN')                    134.000
0086      210   FORMAT(1H ,' BAD DATA WILL BE CHANGED TO MD1')                135.000
0087      220   FORMAT(1H ,' BAD DATA WILL BE CHANGED TO MD2')                136.000
0088      230   FORMAT(1H ,' BAD DATA WILL CAUSE CASE TO BE SKIPPED')         137.000
0089            IF(MC.EQ.0) WRITE(IPRTR,300)                                  138.000
0090            IF(ML.EQ.1) WRITE(IPRTR,310)                                  139.000
0091            IF(ML.EQ.2) WRITE(IPRTR,320)                                  140.000
0092            IF(ML.EQ.3) WRITE(IPRTR,330)                                  141.000
0093     300 FORMAT(1H ,' EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL  142.000
                1DELETE THE CASE')                                            142.000
0094      310   FORMAT(1H ,' MD1 VALUES FOR ANY VARIABLE WILL DELETE THE CASE')  143.000
0095      320   FORMAT(1H ,' MD2 VALUES FOR ANY VARIABLE WILL DELETE THE CASE')  144.000
0096      330   FORMAT(1H ,' ALL CASES KEPT REGARDLESS OF MISSING DATA VALUES')  145.000
                C                                                             146.000
                C                                                             147.000
                C                                                             148.000
0097       1    CALL CASE (I)                                                 149.000
0098            IF(I.EQ.1) GO TO 50                                           150.000
0099            N=N+1                                                         151.000
0100            IF(MC.EQ.3) GO TO 33                                          152.000
0101            DO 31  K=1,NV                                                 153.000
0102            IF(MC.EQ.2) GO TO 32                                          154.000
0103            IF(V(K).NE.VMD1(K)) GO TO 32                                  155.000
0104            NMD1 = NMD1 + 1                                               156.000
0105            GO TO 1                                                       157.000
0106      32    IF(MC.EQ.1) GO TO 31                                          158.000
0107            IF(V(K).LT.VMD2(K)) GO TO 31                                  159.000
0108            NMD2 = NMD2 + 1                                               160.000
0109            GO TO 1                                                       161.000
0110      31    CONTINUE                                                      162.000
0111      33    JG=V(NVT)                                                     163.000
```

```
0112                JS=V(NV+1)                                          164.000
0113                IF(NG.EQ.0) GO TO 2                                 165.000
                C                                                       166.000
0114                DO 3 I=1,NG                                         167.000
0115                IF(JG.EQ.IDG(I)) GO TO 4                            168.000
0116           3    CONTINUE                                            169.000
                C                                                       170.000
0117           2    NG=NG+1                                             171.000
0118                I = NG                                              172.000
0119                IDG(NG) = JG                                        173.000
0120                ADATA(NV+1,NG)=JS                                   174.000
0121                ADATA(NVT,NG)=JG                                    175.000
0122                IF(NS.EQ.1)GO TO 21                                 176.000
0123           4     DO 6 K=1,NS                                        177.000
0124                IF(JS.EQ.IDS(K)) GO TO 7                            178.000
0125           6    CONTINUE                                            179.000
                C                                                       180.000
0126          21     NS=NS+1                                            181.000
0127                IDS(NS) = JS                                        182.000
0128           7    ADATA(NVT+1,I)=ADATA(NVT+1,I)+1                     183.000
                C                                                       184.000
0129                DO 5 J=1,NV                                         185.000
0130           5    ADATA(J,I)=ADATA(J,I)+V(J)                          186.000
0131                GO TO 1                                             187.000
                C                                                       188.000
                C                                                       189.000
                C                                                       190.000
                C                                                       191.000
                C                                                       192.000
                C                                                       193.000
0132          50    CALL SCLOSE(0)                                      194.000
0133                WRITE (IPRTR,30)N,NS,NG                             195.000
0134          30    FORMAT(1HO,'*** AFTER GLOBAL FILTERING',/,5X,       196.000
                   *'SAMPLE SIZE =',I5/5X,'NO.OF STRATA =',I3/5X,'NO.OF GROUPS =',I3)  197.000
0135                NF = N - NMD1 -NMD2                                 198.000
0136                WRITE(IPRTR,400) NMD1,NMD2,NF                       199.000
0137         400    FORMAT(1HO,'*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =',I4,  200.000
                   * //,'*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =',I4,//,      201.000
                   * '*** FINAL NO. OF CASES FOR ANALYSIS =',I5)       202.000
0138                DO 8 I=1,NG                                         203.000
0139                NGROUP=ADATA(NVT+1,I)                               204.000
0140                DO 8 J=1,NV                                         205.000
0141           8    ADATA (J,I)=ADATA(J,I)/NGROUP                       206.000
0142                IF(IFSORT.EQ.0) CALL SORT                           207.000
0143                IF(IFPRED.EQ.0) GO TO 11                            208.000
0144                IF(IFSTAN.EQ.1) CALL STAN                           209.000
0145                IF(IFREGR.EQ.0.AND.IFMAST.NE.2)  CALL CORREL        210.000
0146                CALL SCALE                                          211.000
0147                CALL PTILE1                                         212.000
0148          11    IF(IFPRED.EQ.0) CALL PTILE                          213.000
0149                CALL TEXT                                           214.000
0150                RETURN                                              215.000
0151         200    WRITE(IPRTR,20)                                     216.000
0152          20    FORMAT(1H1,'*** ERROR IN PARAMETER CARD,            217.000
                   *   PLA TERMINATED')                                219.000
```

```
0153          STOP 16                                          219.000
0154          END                                              220.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFPREC	14	IFPRIN	18	IFMAST	1C	IFAE	20	MD	24
IFREGR	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3879C
LIST	3B7A0	NVT	38558						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ISRSET	1C8	IBCOM#	1CC	GFILT	1D0	SETKEY	1D4	GETKEY	1D8
ILIST	1DC	GETDIC	1E0	GNAME	1E4	CASE	1E8	GCLOSE	1EC
SORT	1F0	STAN	1F4	CORREL	1F8	SCALE	1FC	PTICE1	200
PTILE	204	TEXT	208						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
DD	27C	PLK	280	RECADD	284	REC	288	NMD1	28C
NMD2	290	I	294	J	298	NKEY	29C	ISTR	2A0
ITYPE	2A4	ISVN	2A8	IEVN	2AC	INDS	2B0	INDG	2B4
K	2B8	JG	2BC	JS	2C0	NF	2C4	NGROUP	2C8

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
KEYLS	2CC	IVAL	45C	ILOC	498	LABEL	4D4	V	524
VMD1	654	VMD2	CC4	NAM	F74	IS	F8C	IDG	143C
IPS	18EC								

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
1100	1D9C	10	1DBE	40	1DC8	60	1E1C	70	1E4E
110	1E98	120	1EDA	130	1EFC	140	1F22	150	1F40
160	1F60	170	1F79	270	1F8D	210	1F90	220	1FD7
230	1FFE	300	2020	310	2078	320	2080	330	2028
30	2120	400	217E	20	2211				

OPTIONS IN EFFECT ID,PROCIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = INPUT , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 154,PROGRAM SIZE = 11866
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE STAN                                                 221.000
                C                                                               222.000
                C                                                               223.000
                C                                                               224.000
                C   *** STANDARDIZES AGGREGATED DATA MATRIX                     225.000
                C   *** USED IN PREDICTED CRITERION MODE ONLY                   226.000
                C   *** COMPUTES MEANS, STD. DEV. WITHIN STRATA                 227.000
                C   *** STD. SCORE = (SCORE - MEAN) / STD. DEV.                 228.000
                C   *** CALLED BY INPUT                                        229.000
                C                                                               230.000
                C                                                               231.000
                C                                                               232.000
0002            DIMENSION ADATA(203,200)                                        233.000
0003            INTEGER*2 LIST(220)                                             235.000
0004            COMMON /IC/ IN,ITEMP,IPRTR,ISAVE                                236.000
0005            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                237.000
0006            COMMON/PARMS/IGROUP,ISTRAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPRIN,IFMAST  238.000
               1,                                                               239.000
               * IRAC,MC,IFREGR,IFSTAN,IFPS                                     240.000
0007            INDS =ADATA(NV+1,1)                                             240.000
0008            IS = 1                                                          241.000
                C                                                               242.000
0009            DO 1  IP=2,NG                                                   243.000
0010            IF(INDS.EQ.ADATA(NV+1,IP)) GO TO 1                              244.000
0011            IE = IP- 1                                                      245.000
0012            CALL TRANS(IS,IE)                                               246.000
0013            IS = IP                                                         247.000
0014            INDS = ADATA(NV+1,IP)                                           248.000
0015       1    CONTINUE                                                        249.000
                C                                                               250.000
0016            CALL TRANS(IS,NG)                                               251.000
                C                                                               252.000
0017            IF(IFPS .EQ. 0) GO TO 200                                       252.250
0018            NSTAR = 1                                                       253.000
0019       40   NSTOP = NSTAR + 9                                               254.000
0020            KNT = 0                                                         254.250
0021            IF(NSTOP.GT.NV) NSTOP = NV                                      255.000
                C                                                               256.000
0022            DO 2  I=1,NG                                                    260.000
0023            IS = ADATA(NV+1,I)                                              261.000
0024            IG = ADATA(NVT,I)                                               262.000
0025            IF = ADATA(NV+2,I)                                              263.000
0026            IF(KNT .NE. 0) GO TO 115                                        263.010
0027            WRITE(IPRTR,110) (LIST(KK),  KK=NSTAR,NSTOP)                    263.100
0028          110 FORMAT(1H1,'*** LISTING OF STANDARDIZED MATRIX',///,'STRATA',5X,'G  263.200
                1ROUP',                                                         263.200
                *  5X,'FREQUENCY',3X,'VARIABLE NOS.',10I8,/)                    263.300
0029            KNT = 5                                                         263.550
0030          115 WRITE(IPRTR,120) IS,IG,IF,(ADATA(J,I),  J=NSTAR,NSTOP)        264.000
0031       120  FORMAT(1H ,I4,I1,I2,2CX,10F8.2)                                 265.000
0032            KNT = KNT + 1                                                   265.250
0033            IF(KNT .GE. 20) KNT = 0                                         265.500
0034       2    CONTINUE                                                        266.000
                C                                                               267.000
0035            NSTAR = NSTOP + 1                                               268.000
```

```
0036             IF(NSTAR.LE.NV) GO TO 60                    265.000
0037         200 RETURN                                      270.000
0038             END                                         271.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3B95C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3B79C
LIST	2B7A0	NVT	3B95B						

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFPREC	14	IFPRIN	18	IFMAST	1C	IPAD	20	MD	24
IFREGR	28	IFSTAN	2C	IFPS	30				

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
THAMS	F8	IBCOM#	EC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IABS	100	IS	104	IP	108	IE	10C	NSTAR	110
NSTOP	114	KAT	118	I	11C	IG	120	IF	124
KK	128	J	12C						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
110	130	120	150						

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = STAN , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 39,PROGRAM SIZE = 1272
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE TRANS(IS,IE)                                 272.000
                C                                                       273.000
                C                                                       274.000
                C                                                       275.000
                C   *** COMPUTES AND REVISES ADATA ARRAY BY STRATA      276.000
                C   *** CALLED BY STAN                                  277.000
                C                                                       278.000
                C                                                       279.000
                C                                                       280.000
0002            DIMENSION ADATA(203,300)                                281.000
0003            DIMENSION AMEAN(200),STDDEV(200)                        282.000
0004            INTEGER*2 LIST(220)                                     283.000
0005            COMMON N,NG,NS,ADATA,NV,LIST,NVT                        284.000
0006            NGS = IE - IS + 1                                       285.000
0007            DO 1  I=1,NV                                            286.000
0008            DO 2  J=1,NV                                            287.000
0009            AMEAN(J) = 0.                                           288.000
0010          2 STDDEV(J) = 0.                                          289.000
0011            DO 3  K=IS,IE                                           290.000
0012            STDDEV(I) = STDDEV(I) + ADATA(I,K)**2                   291.000
0013          3 AMEAN(I) = AMEAN(I) + ADATA(I,K)                        292.000
0014            AMEAN(I) = AMEAN(I)/NGS                                 293.000
0015            STDDEV(I) = SQRT(STDDEV(I)/NGS - AMEAN(I)**2)           294.000
0016            DO 4  L=IS,IE                                           295.000
0017            IF(STDDEV(I).EQ.0.) STDDEV(I) = 1.0                     296.000
0018            ADATA(I,L) = (ADATA(I,L) - AMEAN(I))/STDDEV(I)          297.000
0019          4 CONTINUE                                                298.000
0020          1 CONTINUE                                                299.000
0021            RETURN                                                  300.000
0022            END                                                     301.000
```

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3679C
LIST	3P7AC	NVT	3P958						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
SQRT	AC								

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NGS	94	IE	B9	IS	BC	I	C0	J	C4
K	C8	L	CC						

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
AMEAN	C0	STDDEV	3E0						

```
*OPTIONS IN EFFECT*   ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*   NAME = TRANS    , LINECNT =      57
*STATISTICS*  SOURCE STATEMENTS =      22,PROGRAM SIZE =     2354
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
0000                SUBROUTINE SORT                                          302.000
                    C                                                        303.000
                    C                                                        304.000
                    C                                                        305.000
                    C   *** SORTS AGGREGATED DATA MATRIX                     306.000
                    C   *** SORT DONE FIRST BY STRATA , THEN BY GROUP        307.000
                    C   *** DATASET DEFINED BY ITEMP CONTAINS UNSORTED ARRAY ADATA  308.000
                    C   *** PRINTS AGGREGATED MATRIX                         309.000
                    C   *** CALLED BY INPUT                                  310.000
                    C                                                        311.000
                    C                                                        312.000
                    C                                                        313.000
0002                DIMENSION ADATA (203,200),STRGRP(2,300)                  314.000
0003                INTEGER PLEN                                             315.000
0004                INTEGER*2 TAG(200)                                       316.000
0005                INTEGER*2 LIST(220)                                      317.000
0006                COMMON/IO/IN,ITEMP,IPRTR,ISAVE                           318.000
0007                COMMON N,NG,NS,ADATA,NV,LIST,NVT                         319.000
                    C                                                        320.000
                    C                                                        321.000
0008                NVT1 = NVT + 1                                           324.000
                    C                                                        325.000
                    C   *** COPY STRATA AND GROUP VARIABLES INTO STRGRP ARRAY  326.000
                    C                                                        327.000
0009                DO 2  I=1,NG                                             328.000
0010                TAG(I) = I                                               329.000
0011                STRGRP(1,I) = ADATA(NV+1,I)                              330.000
0012           2    STRGRP(2,I) = ADATA(NVT,I)                               331.000
                    C                                                        332.000
                    C   *** CALL OSIRIS SORT ROUTINE                         333.000
                    C                                                        334.000
0013                CALL RADIX(STRGRP,NG,8,1,8,2,TAG,2)                      335.000
                    C                                                        336.000
                    C                                                        337.000
                    C *** COPY ADATA MATRIX ON DISK                          338.000
0014                DO 3  I=1,NG                                             339.000
0015           3    WRITE(ITEMP) (ADATA(J,I),  J=1,NVT1)                     340.000
0016                ENDFILE ITEMP                                            341.000
0017                REWIND ITEMP                                             342.000
                    C *** OVERLAY ADATA WITH ORDERED ROWS                    343.000
                    C                                                        344.000
0018                DO 4  I=1,NG                                             345.000
0019                IND = TAG(I) - 1                                         346.000
0020                IF(IND.EQ.0) GO TO 25                                    347.000
0021                DO 5  J=1,IND                                            348.000
0022                READ(ITEMP)                                              349.000
0023           5    CONTINUE                                                 350.000
0024           25   READ(ITEMP) (ADATA(K,I),  K=1,NVT1)                      351.000
0025           4    REWIND ITEMP                                             352.000
                    C                                                        353.000
0026                ISTAR = 1                                                354.000
0027           100  ISTOP = ISTAR + 5                                        355.000
0028                KNT = 0                                                  355.250
0029                IF(ISTOP.GT.NV) ISTOP = NV                               356.000
0030                DO 1 I=1,NG                                              361.000
```

```
0031              IS = ADATA(NV+1,I)                                    362.000
0032              IG = ADATA(NVT,I)                                     363.000
0033              IAA = ADATA(NVT+1,I)                                  364.000
0034              IF(KNT .NE. 0) GO TO 1100                             364.010
0035        120   WRITE(IPRTR,10)(LIST(KK),KK=ISTAR,ISTOP)              364.100
0036         10   FORMAT(1H1,'*** AGGREGATED DATA ***',//,5X,           364.200
                 *'STRATA',5X,'GROUP',5X,'SIZE',10I10///)              364.300
0037              KNT = 5                                               364.310
                C                                                       364.400
0038         1100 WRITE(IPRTR,20) IS,IG,IAA,                            365.000
                 * (ADATA(K,I),  K=ISTAR,ISTOP)                        366.000
0039         20   FORMAT(' ',I8,I11,I10,1X,10F10.2)                     367.000
0040              KNT = KNT + 1                                         367.250
0041              IF(KNT .GE. 60) KNT= 0                                367.500
0042         1    CONTINUE                                              368.000
                C                                                       369.000
0043              ISTAR = ISTOP + 1                                     370.000
0044              IF(ISTAR.LE.NV) GO TO 100                             371.000
                C                                                       372.000
0045              RETURN                                                373.000
0046              END                                                   374.000
```

COMMON BLOCK /ID/ / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3870C
LIST	38780	NVT	38958						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
RADIX	EC	IPCOM#	F0						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NVTI	114	I	118	J	11C	IND	120	K	124
ISTAP	12P	ISTOP	12C	KNT	130	IS	134	IG	138
INP	13C	KK	140						

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
STORP	144	TAG	AA4						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
10	CEC	20	D3E						

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = SORT , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 46,PROGRAM SIZE = 4452
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE PTILE                                                375.000
                C                                                               376.000
                C                                                               377.000
                C                                                               378.000
                C   *** EXTRACTS SUBSCRIPTS OF GROUPS BELONGING TO EACH STRATA   379.000
                C   *** PRINTS PERCENTIZED DATA ARRAY BY STRATA/GROUP ORDERING   380.000
                C   *** CALLS PCENT                                              381.000
                C   *** CALLED BY INPLT                                          382.000
                C                                                               383.000
                C                                                               384.000
                C                                                               385.000
0002            DIMENSION ADATA (203,300)                                       386.000
0003            INTEGER*2 LIST(220)                                             390.000
0004            COMMON/IC/IN,ITEMP,IPRTR,ISAVE                                  391.000
0005            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                392.000
                C                                                               393.000
                C                                                               394.000
0006            REWIND ISAVE                                                    396.000
0007            INDS =ADATA(NV+1,1)                                             398.000
0008            IS = 1                                                          399.000
                C                                                               400.000
0009            DO 1  IP=2,NG                                                   401.000
0010            IF(INDS.EQ.ADATA(NV+1,IP)) GO TO 1                              402.000
0011            IE = IP- 1                                                      403.000
0012            CALL PCENT(IS,IE)                                               404.000
0013            IS = IP                                                         405.000
0014            INDS = ADATA(NV+1,IP)                                           406.000
0015        1   CONTINUE                                                        407.000
                C                                                               408.000
0016            CALL PCENT(IS,NG)                                               409.000
                C                                                               410.000
0017            NSTAR = 1                                                       411.000
0018       60   NSTOP = NSTAR + 9                                               412.000
0019            KNT = 0                                                         412.250
0020            IF(NSTOP.GT.NV) NSTOP = NV                                      413.000
                C                                                               417.000
0021            DO 2  I=1,NG                                                    418.000
0022            IS = ADATA(NV+1,I)                                              419.000
0023            IG = ADATA(NVT,I)                                               420.000
0024            IE = ADATA(NV+2,I)                                              421.000
0025            IF(KNT .NE. 0) GO TO 119                                        421.010
0026            WRITE(IPRTR,110) (LIST(KK), KK=NSTAR,NSTOP)                     421.100
0027      110   FORMAT(1H1,'*** LISTING OF PERCENTIZED MATRIX',///,'STRATA',5X,'GR  421.200
                1OUP',                                                          421.200
                *  5X,'FREQUENCY',3X,'VARIABLE NOS.',10I8,/)                    421.300
0029            KNT = 5                                                         421.550
0029      119   WRITE(IPRTR,120) IS,IG,IE,(ADATA(J,I),  J=NSTAR,NSTOP)          422.000
0030      120   FORMAT(1H ,I4,I11,I12,20X,10F8.2)                               423.000
0031            KNT = KNT + 1                                                   423.250
0032            IF(KNT .GE. 60) KNT= 0                                          423.500
0033        2   CONTINUE                                                        424.000
                C                                                               425.000
0034            NSTAR = NSTOP + 1                                               426.000
0035            IF(NSTAR.LE.NV) GO TO 60                                        427.000
0036            ENDFILE ISAVE                                                   428.000
```

```
0037          RETURN                                          429.000
0038          END                                             430.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IA	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3B95C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3B79C
LIST	3B7AC	NVT	3B95C						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IPCOM#	D8	FCENT	DC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
INDS	F0	IS	F4	IP	F8	IE	FC	NSTAR	100
NSTOP	104	KNT	108	I	10C	IC	110	IF	114
KK	118	J	11C						

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
110	120	120	17F						

OPTIONS IN EFFECT IO,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = PTILE , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 38,PROGRAM SIZE = 1264
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE CORREL                                       431.000
                C                                                       432.000
                C                                                       433.000
                C                                                       434.000
                C   *** COMPUTES SIMPLE REGRESSION COEFF.              435.000
                C   *** USED ONLY IN PREDICTED CRITERION MODE          436.000
                C   *** CALLED BY INPUT                                437.000
                C   *** CALLS XPROD                                    438.000
                C                                                       439.000
                C                                                       440.000
                C                                                       441.000
0002            DIMENSION ADATA(203,300)                                442.000
0003            INTEGER*2 LIST(220)                                     443.000
0004            COMMON /IO/IN,ITEMP,IPRTR,ISAVE                         444.000
0005            COMMON N,NG,NS,ADATA,NV,LIST,NVT                        445.000
0006            REWIND IN                                               446.000
0007            INDS =ADATA(NV+1,1)                                     447.000
0008            IS = 1                                                  448.000
                C                                                       449.000
0009            DO 1  IP=2,NG                                           450.000
0010            IF(INDS.EQ.ADATA(NV+1,IP)) GO TO 1                      451.000
0011            IE = IP- 1                                              452.000
0012            CALL XPROD(IS,IE)                                       453.000
0013            IS = IP                                                 454.000
0014            INDS = ADATA(NV+1,IP)                                   455.000
0015        1   CONTINUE                                                456.000
                C                                                       457.000
0016            CALL XPROD(IS,NG)                                       458.000
0017            ENDFILE IN                                              459.000
0018            REWIND IN                                               460.000
0019            RETURN                                                  461.000
0020            END                                                     462.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3879C
LIST	38740	NVT	3895E						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IFCOMM	AC	XPROD	BC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IADS	C4	IS	C8	IP	CC	IE	D0		

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = CORREL , LINECNT = 57
STATISTICS. SOURCE STATEMENTS = 20,PROGRAM SIZE = 612
STATISTICS NO DIAGNOSTICS GENERATED

```
0001          SUBROUTINE XPROC(IS,IF)                                  465.000
              C                                                        466.000
              C                                                        467.000
              C                                                        468.000
              C   *** COMPUTES SIMPLE REGRESSION COEFF.                469.000
              C   *** WRITES ON DISK(IN)                               470.000
              C   *** CALLED BY COBOL                                  471.000
              C                                                        472.000
              C                                                        473.000
              C                                                        474.000
0002          DIMENSION ADATA(203,300),XP(200)                         475.000
0003          INTEGER*2 LIST(220)                                      476.000
0004          COMMON /IC/IN,ITEMP,IPRTR,ISAVE                          477.000
0005          COMMON N,NG,NS,ADATA,NV,LIST,NVT                         478.000
0006          NV1 = NV - 1                                             481.000
0007          NGS = IF - IS + 1                                        482.000
0008          DO 1  I=1,NV1                                            483.000
0009        1 XP(I) = 0.                                               484.000
0010          DO 2  I=1,NV1                                            485.000
0011          DO 2  J=IS,IF                                            486.000
0012        2 XP(I) = XP(I) + ADATA(NV,J)*ADATA(I,J)                   487.000
0013          DO 3  K=1,NV1                                            488.000
0014        3 XP(K) = XP(K)/NGS                                        489.000
0015          WRITE(IN) (XP(I),  I=1,NV1)                              490.000
0016          RETURN                                                   491.000
0017          END                                                      492.000
```

COMMON BLOCK /I/ / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3879C
LIST	3878Q	NVT	3858B						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IFCLAN	80								

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NVL	84	NGS	88	IF	8C	IS	C0	I	C4
J	C8	K	CC						

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
XP	D0								

```
*OPTIONS IN EFFECT*   ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*   NAME = XPROD    , LINECNT =      57
*STATISTICS*     SOURCE STATEMENTS =       17,PROGRAM SIZE =     1500
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
0001            SUBROUTINE PCENT(IS,IF)                                          493.000
                C                                                                494.000
                C                                                                495.000
                C                                                                496.000
                C   *** SORTS DATA FOR EACH VARIABLE WITHIN STRATA                497.000
                C   *** COMPUTES AND PRINTS DECILES (OPTIONAL)                    498.000
                C   ** WRITES DECILES ON ISAVE DSN IF MASTER DATASET              499.000
                C   *** CALLS RADIX AND MACRO                                     500.000
                C   *** CALLED BY PTILE                                          501.000
                C                                                                502.000
                C                                                                503.000
                C                                                                504.000
0002            DIMENSION ADATA(205,300)                                         505.000
0003            DIMENSION ITAG(300)                                              506.000
0004            DIMENSION SORTV(300)                                             507.000
0005            DIMENSION PIND(10),DEC(9),IDEC(9)                                508.000
0006            INTEGER *2 LIST(220)                                             509.000
0007            COMMON /IC/ IN,ITEMP,IPSTR,ISAVE                                 510.000
0008            COMMON/PARMS/IGROUP,ISTRAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPRIN,IFMAST 511.000
               1,                                                                511.000
               * IEXEC,MC,IFREGR,IFSTAN,IFPS                                     512.000
0009            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                 513.000
                C                                                                514.000
                C                                                                515.000
0010            NVT1 =NVT + 1                                                    516.000
0011            KAT = 0                                                          517.000
0012            DO 3  I=1,9                                                      519.000
0013          3 IDEC(I) = I                                                      520.000
                C                                                                525.000
                C                                                                526.000
0014            DO 1  I=1,NV                                                     527.000
0015            IVAR = LIST(I)                                                   528.000
0016            N = 0                                                            529.000
                C                                                                530.000
0017            DO 2  J=IS,IF                                                    531.000
0018            N = N + 1                                                        532.000
0019            ITAG(N) = N                                                      533.000
0020          2 SORTV(N) = ADATA(I,J)                                            534.000
                C                                                                535.000
                C                                                                536.000
0021            CALL RADIX(SORTV,N,4,1,4,2,ITAG,4)                               537.000
0022            ISTRAT = ADATA(NV+1,IS)                                          538.000
0023            MIN = ITAG(1)                                                    539.000
0024            VMIN = ADATA(I,IS+MIN-1)                                         540.000
0025            MAX = ITAG(N)                                                    541.000
0026            VMAX = ADATA(I,IS+MAX-1)                                         542.000
0027            IF(IFPRIN.EQ.0.AND.IFMAST.EQ.0) GO TO 30                         543.000
                C                                                                544.000
                C   *** COMPUTE DECILES                                          545.000
                C                                                                546.000
0028            DO 7  II=1,9                                                     547.000
0029            PIND(II) = ((N-1)/10.) * II + 1                                  548.000
0030            IND = PIND(II)                                                   549.000
0031          7 DEC(II) = SORTV(IND) + (PIND(II)-IND)*(SORTV(IND+1)-SORTV(IND))  550.000
                C                                                                551.000
```

```
0032              IF(IFMAST.EQ.1) WRITE(ISAVE) VMIN,DEC,VMAX                    552.000
0033              IF(KNT .NE. 0) GO TO 15                                       552.010
0034              IF(IFPRIN.NE.0) WRITE(IPRTP,50) IDEC                          552.100
0035         50   FORMAT(1H1,'*** DECILE PRINTOUT',//,' STRATA',3X,'VARIABLE',  552.200
                * 3X,'MINIMUM',3X,'MAXIMUM',3X,9I9/)                           552.300
0036              KNT = 5                                                       552.310
                  C                                                             552.400
0037         15   IF(IFPRIN.NE.0) WRITE(IPRTP,20) ISTRAT,IVAR,VMIN,VMAX,DEC    553.000
0038         20   FORMAT(' ',I4,110,2X,2F10.2,6X,9F9.2)                         554.000
0039              KNT = KNT + 1                                                 554.250
0040              IF(KNT .GE. 60) KNT = 0                                       554.500
                  C                                                             555.000
0041         30   IF(IFMAST.EQ.2) CALL MACHC(1,IS,IE)                           556.000
0042              IF(IFMAST.EQ.2) GO TO 1                                       557.000
                  C                                                             558.000
0043              DO 8 II=IS,IE                                                 559.000
0044              JINC = ITAG(II-IS+1) + IS - 1                                 560.000
0045              IF(N.EQ.1) P = .5                                             561.000
0046              IF(N.EQ.1) GO TO 8                                            562.000
0047              P = 1.0*(II-IS)/(N-1)                                         563.000
0048         8    ADATA(I,JINC) = P                                             564.000
                  C                                                             565.000
0049         1    CONTINUE                                                      566.000
                  C                                                             567.000
                  C                                                             568.000
                  C                                                             569.000
0050              RETURN                                                        570.000
0051              END                                                           571.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IFPGUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFPRED	14	IFPRIN	18	IFMAST	1C	IPAC	20	MD	24
IFRFOF	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3B95C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3B79C
LIST	3B7A0	NVT	3B958						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
RADIX	FC	IRCOM#	100	MACHD	104				

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NVTI	134	KNT	138	I	13C	IVAP	140	J	144
IS	148	IF	14C	MIN	150	VMIN	154	MAX	158
VMAX	15C	II	160	IND	164	JIND	168	P	16C

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ITAG	170	SORTV	620	PIND	ADD	CEC	AF8	10EC	B1C

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
50	040	20	38E						

```
*OPTIONS IN EFFECT*   IC,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
*OPTIONS IN EFFECT*   NAME = PCENT    , LINECNT =      57
*STATISTICS*     SOURCE STATEMENTS =        51,PROGRAM SIZE =     4326
*STATISTICS*  NO DIAGNOSTICS GENERATED
```

```
0001            SUBROUTINE MACHC(I,IS,IF)                                       572.000
                C                                                               573.000
                C                                                               574.000
                C                                                               575.000
                C   *** READS DECILES FROM ISAVE BASED ON NATIONAL NORMS         576.000
                C   *** CONVERTS RAW NORMS TO PERCENTILES USING LINEAR INTERPOLATION 577.000
                C   *** CALLED BY PCENT                                         578.000
                C                                                               579.000
                C                                                               580.000
                C                                                               581.000
0002            DIMENSION ADATA(203,300),AMAST(11)                              582.000
0003            INTEGER*2 LIST(220)                                             583.000
0004            COMMON /IC/ IA,ITEMP,IPRTR,ISAVE                                584.000
0005            COMMON/PARMS/IGROUP,ISTRAT,IPMAX,IPMIN,IFSCRT,IFPRED,IFPRIN,IFMAST 585.000
               1,                                                               585.000
               * ISAE,MC,IFREGR,IFSTAN,IFPS                                     586.000
0006            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                587.000
                C                                                               588.000
                C                                                               589.000
0007            READ(ISAVE) (AMAST(J),  J=1,11)                                 590.000
                C                                                               591.000
                C   *** CHECK FOR VALUES OUTSIDE DECILE RANGE                   592.000
0008            DO 3  J=IS,IF                                                   593.000
0009            IF(ADATA(I,J).GT.AMAST(1)) GO TO 11                             594.000
0010            ADATA(I,J) = 0.                                                 595.000
0011            GO TO 3                                                         596.000
0012        11  IF(ADATA(I,J).LT.AMAST(11)) GO TO 12                           597.000
0013            ADATA(I,J) = 1.0                                                598.000
0014            GO TO 3                                                         599.000
                C                                                               600.000
                C                                                               601.000
0015        12  DO 4  K=2,10                                                   602.000
0016            IF(ADATA(I,J).GT.AMAST(K)) GO TO 4                              603.000
0017            FRACT = (ADATA(I,J) - AMAST(K-1)) / (AMAST(K) - AMAST(K-1))     604.000
0018            FRACT = 0.1*FRACT                                               605.000
0019            ADATA(I,J) = (K-2)/10. + FRACT                                  606.000
0020            GO TO 3                                                         607.000
0021        4   CONTINUE                                                        608.000
                C                                                               609.000
0022        3   CONTINUE                                                        610.000
                C                                                               611.000
0023            RETURN                                                          612.000
0024            END                                                             613.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFREE	14	IFPRIN	18	IFMAST	1C	IPAC	20	MD	24
IFRGR	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	AG	4	NS	8	ACATA	C	NV	3679C
LIST	37740	AVT	3859F						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IPCLYR	C8								

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
J	DC	IS	E0	IE	E4	I	E8	K	EC
ERSCT	F0								

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
AMAST	F4								

OPTIONS IN EFFECT ID,EPCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = MACHC ,LINECNT = 57
STATISTICS SOURCE STATEMENTS = 24,PROGRAM SIZE. = 344
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE SCALE                                                614.000
                C                                                               615.000
                C                                                               616.000
                C                                                               617.000
                C   *** GENERATES SCORES FOR PREDICTED CRITERION SCORE MODE     618.000
                C   *** READS REGRESSION COEFFS. FROM DSKN 'IN'                 619.000
                C   *** CALLED BY INPUT                                         620.000
                C                                                               621.000
                C                                                               622.000
                C                                                               623.000
0002            DIMENSION SCALE(200),ADATA(203,300)                             624.000
0003            INTEGER*2 LIST(200)                                             625.000
0004            COMMON /IO/ IN,ITEMP,IPRTR,ISAVE                                626.000
0005            COMMON/PARMS/IGROUP,ISTRAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPRIN,IFMAST  627.000
               1,                                                               627.000
               * IBAL,MD,IFREGR,IFSTAN,IFPS                                     628.000
0006            COMMON N,NG,NS,ADATA,NV,LIST,NVT                                629.000
                C                                                               630.000
                C                                                               631.000
                C                                                               632.000
0007            NV1 = NV - 1                                                    635.000
0008            IF(IFMAST.EQ.2) NV1 = NV                                        636.000
0009            JS = 0                                                          637.000
0010            IS = ADATA(NV+1,1)                                              638.000
0011            DO 1  I=1,300                                                   639.000
0012            IF(I.GT.NG) GO TO 100                                           640.000
0013            INS = ADATA(NV+1,I)                                             641.000
0014            IF(INS.EQ.IS.AND.I.NE.1)  GO TO 150                             642.000
0015            READ(IN,END=100) (SCALE(J),  J=1,NV1)                           643.000
0016            IS = INS                                                        644.000
0017            JS=JS + 1                                                       647.000
0018       150  DO 1  K=1,NV1                                                   648.000
0019            ADATA(K,I) = ADATA(K,I)*SCALE(K)                                649.000
0020       1    CONTINUE                                                        650.000
0021       100  IF(I.NE.NG+1) GO TO 200                                         651.000
0022            NSTAR = 1                                                       652.000
0023       60   NSTOP = NSTAR + 9                                               653.000
0024            KNT = 0                                                         653.100
0025            IF(NSTOP.GT.NV) NSTOP = NV                                      654.000
                C                                                               658.000
0026            DO 2  I=1,NG                                                    659.000
0027            IS = ADATA(NV+1,I)                                              660.000
0028            IG = ADATA(NVT,I)                                               661.000
0029            IF = ADATA(NV+3,I)                                              662.000
0030            IF(KNT .NE. 0) GO TO 119                                        662.010
0031            WRITE(IPRTR,110) (LIST(KK),  KK=NSTAR,NSTOP)                    662.100
0032       110  FORMAT(1H1,'*** LISTING OF PRED. CRIT. SCORES',///,'STRATA',5X,'GR  662.200
               1OUP',                                                           662.200
               * 5X,'FREQUENCY',3X,'VARIABLE NOS.',10I8,/)                      662.300
0033            KNT = 5                                                         662.550
0034       119  WRITE(IPRTR,120) IS,IG,IF,(ADATA(J,I),  J=NSTAR,NSTOP)         663.000
0035       120  FORMAT(1H ,I4,I11,I12,20X,10F8.2)                               664.000
0036            KNT = KNT + 1                                                   664.250
0037            IF (KNT .GE. 60) KNT = 0                                        664.500
0038       2    CONTINUE                                                        665.000
```

```
                C                                                               666.000
0039                NSTAR = NSTOP + 1                                           667.000
0040                IF(NSTAR.LE.NV) GO TO 60                                    668.000
0041                IF(JS.NE.NS) GO TO 500                                      669.000
0042                REWIND IA                                                   670.000
0043                RETURN                                                      671.000
                C                                                               672.000
0044          200   WRITE(IPRTR,210) I                                          673.000
0045          210   FORMAT('1','*** INCORRECT NO. OF SCALING RECORDS','  I=',I3) 674.000
                C                                                               675.000
0046          500   WRITE(IPRTR,510) JS                                         676.000
0047            510 FORMAT(1H0,'*** INCORRECT NO. OF SCALING RECORDS, NO. OF STRATA RE 677.000
                  1CORDS =',I4)                                                 677.000
0048                STOP                                                        678.000
0049                END                                                         679.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFREED	14	IFPRIN	18	IFMAST	1C	IPAC	20	MD	24
IFREGR	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3B95C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ADATA	C	NV	3B79C
LIST	3B7A0	NVT	3B958						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IFCOMM	10C								

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NV1	110	JS	114	IS	118	I	11C	INS	120
J	124	K	128	NSTAR	12C	NSTOP	130	KNT	134
IG	138	IF	13C	KK	140				

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
SCALE	144								

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
110	464	120	4C3	210	4D5	510	508		

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = SCALE , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 49,PROGRAM SIZE = 2486
STATISTICS NO DIAGNOSTICS GENERATED

```
0001            SUBROUTINE PTILE1                                       680.000
                C                                                       681.000
                C                                                       682.000
                C                                                       683.000
                C   *** GENERATES PERCENTILES IN PREDICTED CRITERION SCORE MODE   684.000
                C   *** SORTS CRITERION SCORES WITHIN GROUPS AND REPLACES BY PERCENTILES  685.000
                C   *** CALLS RADIX                                       686.000
                C   *** CALLED BY INPUT                                   687.000
                C                                                       688.000
                C                                                       689.000
                C                                                       690.000
0002            INTEGER*2 LIST(220)                                     691.000
0003            DIMENSION ACATA(203,300)                                692.000
0004            DIMENSION ITAG(300),SORTV(300)                          693.000
0005            DIMENSION GPER(9),IGPER(9)                              694.000
0006            COMMON/PARMS/IGROUP,ISTAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPRIN,IFMAST  695.000
                1,                                                      695.000
                * IRAT,MC,IFREGR,IFSTAN,IFPS                            696.000
0007            COMMON /IO/ IN,ITEMP,IPRT2,ISAVE                        697.000
0008            COMMON N,NG,NS,ACATA,NV,LIST,NVT                        698.000
                C                                                       699.000
                C                                                       700.000
0009            KNT = 0                                                 700.100
0010            ISP = NVT - 1                                           700.250
0011            IF(IFMAST.NE.2) NV = NV - 1                             701.000
0012            DO 5  I=1,9                                             704.000
0013        5   IGPER(I) = I                                            705.000
                C                                                       709.000
0014            DO 1  I=1,NG                                            710.000
                C   *** LOAD SORT ARRAY SORTV                           711.000
0015            DO 2  J=1,NV                                            712.000
0016            SORTV(J) = ACATA(J,I)                                   713.000
0017        2   ITAG(J) = J                                             714.000
                C   *** CALL OSIRIS SORT ROUTINE                        715.000
0018            CALL RADIX(SORTV,NV,4,1,4,2,ITAG,4)                     716.000
                C *** RE-ASSIGN ACATA VALUES PERCENTILE SCORES          717.000
0019            DO 4  K=1,9                                             719.000
0020            PIND = ((NV-1)/20.) * K + 1                             719.000
0021            IND = PIND                                              720.000
0022            IL = ITAG(IND)                                          721.000
0023            IH = ITAG(IND+1)                                        722.000
0024        4   GPER(K) = ACATA(IL,I) + (PIND-IND)*(ACATA(IH,I) - ACATA(IL,I))  723.000
                C                                                       724.000
0025            IF(IFPRIN .EQ. 0) GO TO 300                             724.250
0026            IS = ACATA(NVT-1,I)                                     725.000
0027            IG = ACATA(NVT,I)                                       726.000
0028            MIN = ITAG(1)                                           727.000
0029            VMIN = ACATA(MIN,I)                                     729.000
0030            MAX = ITAG(NV)                                          729.000
0031            VMAX = ACATA(MAX,I)                                     730.000
0032            MINV = LIST(MIN)                                        731.000
0033            MAXV = LIST(MAX)                                        732.000
0034             IF(KNT .NE. 0) GO TO 35                                732.001
0035            WRITE(IPRT2,30) IGPER                                   732.010
0036       30   FORMAT(1H1,'STRATA',3X,'GROUP',3X,'MIN. VAR.',3X,'VALUE',3X,  732.100
```

```
                     * 'MAX. VAR.',3X,'VALUE',3X,/17//)                          732.200
0037                 KNT = 3                                                    732.450
0038              35 WRITE(IPRTR,40) IS,IG,MINV,VMIN,MAXV,VMAX,GPER             733.000
0039         40      FORMAT(1H ,I4,I9,I10,F13.2,I7,F12.2,5X,9F7.2)              734.000
0040                 KNT = KNT + 1                                              734.250
0041                 IF(KNT .GE. 60) KNT = 0                                    734.500
               C                                                                735.000
0042            300 DO 3  K=1,NV                                                736.000
0043                 JIND = ITAG(K)                                             737.000
0044         3       ADATA(JIND,I) = 1.0*(K-1)/(NV-1)                           739.000
0045         1       CONTINUE                                                   739.000
0046                 NSTAR = 1                                                  740.000
0047         60      NSTOP = NSTAR + 9                                          741.000
0048                 IF(NSTOP.GT.NV) NSTOP = NV                                 742.000
0049                 KNT = 0                                                    742.250
               C                                                                746.000
0050                 DO 7  I=1,NG                                               747.000
0051                 IS = ADATA(ISP,I)                                          748.000
0052                 IG = ADATA(NVT,I)                                          749.000
0053                 IF = ADATA(NVT+1,I)                                        750.000
0054                 IF(KNT .NE. 0) GO TO 119                                   750.010
0055                 WRITE(IPRTR,110) (LIST(KK),  KK=NSTAR,NSTOP)               750.100
0056           110 FORMAT(1H1,'*** LISTING OF PERCENTILED MATRIX',///,'STRATA',5X,'GR   750.200
                    1OUP',                                                      750.200
                    *  5X,'FREQUENCY',3X,'VARIABLE NOS.',10I8,/)                750.300
0057                 KNT = 5                                                    750.550
0058           119 WRITE(IPPTR,120) IS,IG,IF,(ADATA(J,I),  J=NSTAR,NSTOP)       751.000
0059         120     FORMAT(1H ,I4,I11,I12,20X,10F8.2)                          752.000
0060                 KNT = KNT + 1                                              752.250
0061                 IF(KNT .GE. 60) KNT = 0                                    752.500
0062         7       CONTINUE                                                   753.000
               C                                                                754.000
0063                 NSTAR = NSTOP + 1                                          755.000
0064                 IF(NSTAR.LE.NV) GO TO 60                                   756.000
0065                 RETURN                                                     757.000
0066                 END                                                        758.000
```

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IFPSEC	14	IFPRIN	18	IFMAST	1C	IEAC	20	MD	24
IFREGR	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK /ID / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK / / MAP SIZE 3895C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3875C
LIST	3B7A0	NVT	3B95E						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
RADIX	100	IRCCM*	104						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
KFT	128	ISP	12C	I	130	J	134	K	138
PIND	13C	IND	140	IL	144	IF	149	IS	14C
IG	150	MIN	154	VMIN	158	MAX	15C	VMAX	160
MINV	164	MAXV	168	JIND	16C	NSTAR	170	NSTOP	174
O	178	IE	17C	KK	180				

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
ITAG	184	SORTV	624	GPER	AE4	IGPER	B08		

FORMAT STATEMENT MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
30	B2C	40	B76	110	B90	120	BEE		

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = PTILE1 , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 66,PROGRAM SIZE = 4716
STATISTICS NO DIAGNOSTICS GENERATED

```
0001          SUBROUTINE TEXT                                                   759.000
              C                                                                 760.000
              C                                                                 761.000
              C                                                                 762.000
              C   *** SCANS PERCENTIZED MATRIX IN BOTH MODES (PERCENTIZED NORMS AND  763.000
              C PREDICTED CRITERION SCORES)                                     763.000
              C    *** EXTRACTS EXTREME NORMS (OR VARIABLES) BASED ON PMIN , PMAX  764.000
              C KEYWORD VALUES                                                  764.000
              C   *** SORTS EXTREMES INTO ASCENDING ORDER                      765.000
              C   *** PRINTS EXTREMES FOR EACH GROUP                           766.000
              C                                                                 767.000
              C                                                                 768.000
              C                                                                 769.000
0002          DIMENSION ADATA(200,300)                                          770.000
0003          INTEGER*2 LIST(200),NVLOW(200),NVHIGH(200)                        771.000
0004          DIMENSION PHIGH(200),PLOW(200)                                    772.000
0005          COMMON /IO/ IN,ITEMP,IPRTR,ISAVE                                  773.000
0006          COMMON/PARMS/ICROUP,ISTAT,IPMAX,IPMIN,IFSORT,IFPRED,IFPPIN,IFMAST  774.000
             1,                                                                 774.000
             * IBAC,MC,IFREGR,IFSTAN,IFFS                                       775.000
0007          COMMON N,NG,NS,ADATA,NV,LIST,NVT                                  776.000
              C                                                                 777.000
              C                                                                 778.000
0008          WRITE(IPRTR,20)                                                   781.000
0009    20    FORMAT(1H1,'*** LISTING OF NORM EXTREMES BY GROUP',/,             782.000
             * ' RANK ORDERING BY PERCENTILE MAGNITUDE')                        783.000
0010          PMIN = IPMIN/100.                                                 784.000
0011          PMAX = IPMAX/100.                                                 785.000
0012          ISP = NVT - 1                                                     785.250
              C                                                                 786.000
0013          DO 1  J=1,NG                                                      787.000
0014          INDL = 0                                                          788.000
0015          INDH = 0                                                          789.000
              C                                                                 790.000
0016          DO 2  I=1,NV                                                      791.000
0017          IF(ADATA(I,J).GE.PMIN) GO TO 3                                    792.000
0018          INDL = INDL + 1                                                   793.000
0019          NVLOW(INDL) = LIST(I)                                             794.000
0020          PLOW(INDL) = ADATA(I,J)                                           795.000
0021    3     IF(ADATA(I,J).LE.PMAX) GO TO 2                                    796.000
0022          INDH = INDH + 1                                                   797.000
0023          NVHIGH(INDH) = LIST(I)                                            798.000
0024          PHIGH(INDH) = ADATA(I,J)                                          799.000
0025    2     CONTINUE                                                          800.000
              C                                                                 801.000
0026          IS = ADATA(ISP,J)                                                 802.000
0027          IG = ADATA(NVT+1,J)                                               803.000
0028          IF = ADATA(NVT+2,J)                                               804.000
0029          IF(INDL.NE.0.OR.INDH.NE.0) WRITE(IPRTR,30) IS,IG,IF               805.000
0030    30    FORMAT(1H-,///,'*** SUBJECT NO.',I3,5X,'GROUP NO.',I5,5X,         806.000
             *  'SAMPLE SIZE =',I4)                                            807.000
0031          IF(INDL.NE.0) CALL RATIX(PLOW,INDL,4,1,4,2,NVLOW,2)               808.000
0032          IF(INDL.NE.0) WRITE(IPRTR,50) (NVLOW(K),PLOW(K), K=1,INDL)        809.000
0033    50    FORMAT(1H0,'*** LOW SCORES',//,T20,'VARIABLE NUMBER',T40          810.000
             * ,'PERCENTILE',/,(T25,I5,T42,F5.30))                              811.000
```

```
                IF(INDH.NE.0) CALL RADIX(PHIGH,INDH,4,1,4,2,NVHIGH,2)                  812.000
                IF(INDH.NE.0) WRITE(IPR,40) (NVHIGH(K),PHIGH(K),  K=1,INDH)            813.000
     40         FORMAT(1H0,'*** HIGH SCORES',//,T20,'VARIABLE NUMBER',T40,              814.000
                * 'PERCENTILE',/,(T25,I5,T42,F5.3))                                     815.000
     1          CONTINUE                                                               816.000
C                                                                                       817.000
                RETURN                                                                  818.000
                END                                                                     819.000
```

COMMON BLOCK /IO / MAP SIZE 10

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IN	0	ITEMP	4	IPRTR	8	ISAVE	C		

COMMON BLOCK /PARMS / MAP SIZE 34

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IGROUP	0	ISTRAT	4	IPMAX	8	IPMIN	C	IFSORT	10
IPREF	14	IPRTA	18	IFMAST	1C	IFAC	20	MD	24
IERROR	28	IFSTAN	2C	IFPS	30				

COMMON BLOCK / / MAP SIZE 3B95C

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
N	0	NG	4	NS	8	ACATA	C	NV	3B79C
LIST	3B7AC	NVT	3B95P						

SUBPROGRAMS CALLED

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
IBCOM#	CC	RADIX	FC						

SCALAR MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
PAIR	124	PMAX	128	ISP	12C	J	130	INDL	134
INDR	138	I	13C	IS	140	IG	144	IF	148
K	14C								

ARRAY MAP

SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
NVLOW	150	NVHIGH	2EC	PHIGH	470	PLOW	790		

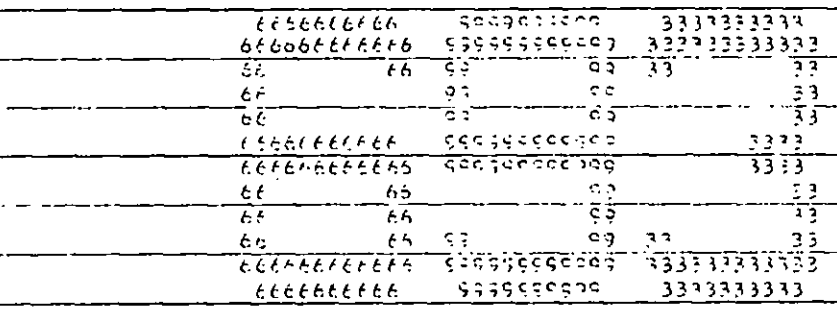
FORMAT STATEMENT MAP

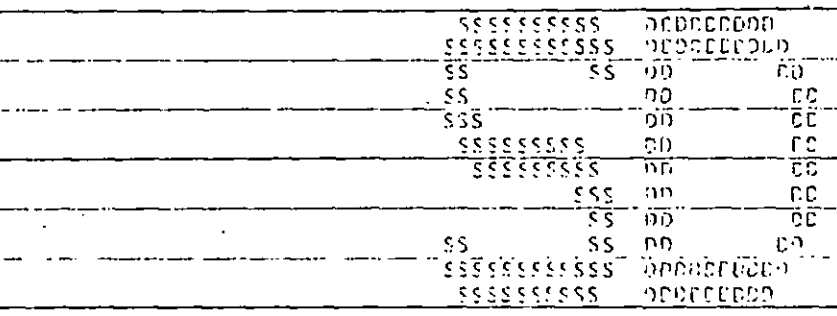
SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION	SYMBOL	LOCATION
20	AF0	30	BC5	50	B41	40	B86		

OPTIONS IN EFFECT ID,EBCDIC,SOURCE,NOLIST,NODECK,LOAD,MAP
OPTIONS IN EFFECT NAME = TEXT , LINECNT = 57
STATISTICS SOURCE STATEMENTS = 20,PROGRAM SIZE = 3964
STATISTICS NO DIAGNOSTICS GENERATED

NO STATEMENTS FLAGGED IN THE ABOVE COMPILATIONS.

JOB #1, 693490 UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL CT124) 20:51.23 TUE OCT 15/74

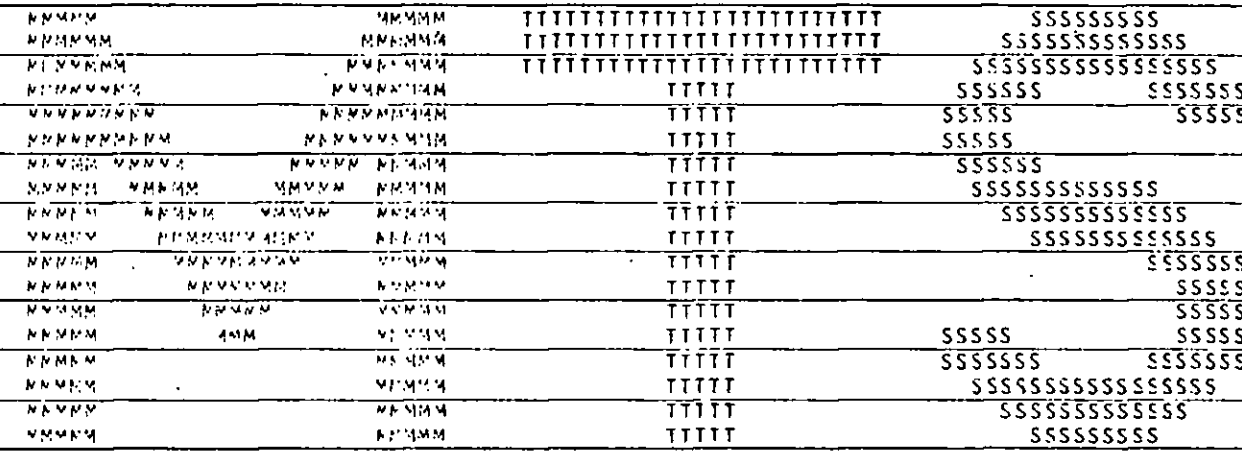


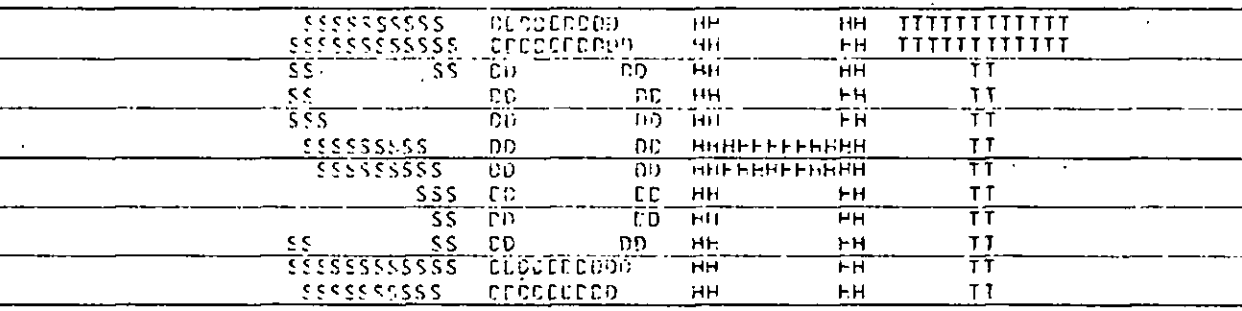


Appendix B

Sample Printouts of the Calculator and Prioritizer Functions

JOB NO. 693821 UNIVERSITY OF MICHIGAN TERMINAL SYSTEM (MODEL CT1241) 10:44.05 WED OCT 16/74





***** 10-CE-74 DUE TO NTS HARDWARE PROBLEMS, THE PROGRAMS MMP, NTILE, REGR, AND *****
***** SCRMFR WERE TEMPORARILY UNAVAILABLE. THEY SHOULD NOW BE ALL BE O-KAY *****

*****LISTING OF SETUP FOLLOWS:

```
CARD
 NO.    1234567890123456789012345678901234567890123456789012345678901234567890
   1    &RUN NORM
   2    TEST RUN
   3    &VARS=3 SVAR=6 DECI  *
   4    V10-V12*
   5    &ENDFILE
```

GVAR=3 SVAR=6 DEC1 *

THE VARIABLE LIST IS:

V10-V12*

	VAR.	TYPE	VARIABLE NAME	TLOC	WIDTH	NCDEC	RESP.	MDCODE1	MDCODE2	REFNO	ID	TSEQNO
T	3	0	WORK GROUP NO.	10	5	0	1	0099999				00000
T	6	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	10	0	10 CO HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000006			00000

```
*** PARAMETER SPECIFICATION

 STRATA VARIABLE IS :     2-DIGIT CLASS              VARIABLE NO.    6
 GROUP VARIABLE IS :      WORK GROUP NO.             VARIABLE NO.    3
 MINIMUM PERCENTILE IS THE 40TH
 MAXIMUM PERCENTILE IS THE 60TH
 DECILE PRINT-OUT REQUESTED
 PERCENTILES NORMS MODE
 MASTER DATA SET
 BAD DATA WILL TERMINATE RUN
 EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
     SAMPLE SIZE =  482
     NO.OF STRATA =  5
     NO.OF GROUPS = 67

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =   3

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =   0

*** FINAL NO. OF CASES FOR ANALYSIS =  477
```

*** [illegible] DATA ***

SUBJECT	GROUP	SIZE	10	11	12
3	350	5	4.00	4.20	3.40
0	355	5	3.40	3.60	2.80
0	1045	1	4.00	6.00	3.00
0	1180	2	2.50	2.00	1.50
0	1185	7	2.86	2.57	2.43
0	1200	8	4.12	3.50	2.37
0	1275	5	3.40	3.20	2.80
0	1285	8	3.37	3.75	3.50
2	75	5	3.60	3.20	2.80
2	155	4	2.50	1.75	2.00
2	178	5	4.00	3.80	3.60
2	250	7	4.00	3.43	2.71
2	285	3	4.33	4.00	4.00
2	345	3	3.33	3.00	2.67
2	370	4	3.75	3.75	3.50
2	410	6	3.33	3.33	2.67
2	435	1	4.00	3.00	2.00
2	530	11	3.18	3.18	3.18
2	605	8	3.37	3.62	3.00
2	665	19	3.79	3.42	3.42
2	730	11	3.00	3.00	2.27
2	850	7	3.14	3.29	3.14
2	970	3	2.33	2.33	3.00
2	1100	9	3.11	3.11	3.11
2	1170	12	2.50	2.50	2.17
2	1250	3	4.33	4.00	3.00
2	1260	6	3.83	3.83	2.50
2	1280	7	3.43	3.71	2.43
2	1400	17	3.06	3.00	2.29
2	1350	6	3.33	3.67	3.83
2	1403	5	4.00	4.00	4.00
2	1455	6	3.83	3.33	3.50
2	1500	3	3.33	3.00	2.67
2	1560	3	4.33	4.33	3.67
2	1600	9	4.00	3.78	3.78
2	1640	1	3.00	3.00	1.00
2	1630	2	3.50	4.50	4.00
2	1695	2	4.00	4.00	3.50
2	1775	5	3.00	3.40	3.00
2	1811	7	3.43	2.86	2.57
2	1861	6	3.50	3.50	3.00
2	1900	4	4.50	4.00	2.75
2	1970	6	4.17	3.83	3.50
2	2025	7	3.86	3.71	3.14
2	2096	6	3.33	3.33	3.50
2	2130	2	4.50	4.50	3.00
2	2166	5	3.60	3.20	2.40
2	2205	7	3.43	3.29	3.43
2	2240	2	4.00	4.50	4.00
2	2291	6	4.17	3.83	3.17
2	2405	4	3.25	3.75	2.25
3	25	5	3.40	3.00	2.80
3	90	4	2.50	1.50	2.00
3	140	2	4.00	4.00	3.50
3	240	4	3.50	3.50	3.00

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12
3	400	1	2.00	4.00	4.00
3	475	5	3.80	3.80	2.00
3	480	5	3.40	3.60	1.20
3	500	5	3.20	2.60	2.60
3	525	2	2.00	2.00	3.00
3	595	1	5.00	5.00	4.00
3	800	6	4.00	3.17	2.17
3	865	9	3.22	3.22	3.11
3	1030	6	3.67	3.17	3.67
3	1060	5	3.40	3.40	2.80
3	1065	1	3.00	1.00	1.00
3	1210	3	3.67	4.33	3.33
3	1235	5	4.00	4.00	3.60
3	1240	10	3.60	3.00	2.50
3	1245	8	3.37	3.50	2.37
3	1525	7	4.14	3.86	4.14
3	1345	1	4.00	4.00	3.00
3	1350	3	3.67	3.67	4.33
3	1445	3	4.33	4.00	3.33
3	1595	4	4.25	3.50	3.75
3	1770	5	4.20	3.60	4.00
3	1855	2	4.00	3.50	3.00
3	1950	1	4.00	4.00	3.00
3	2015	2	4.00	4.00	3.50
3	2065	6	3.83	3.50	2.67
3	2190	2	3.50	3.00	2.50
3	2330	5	3.40	3.20	3.00
3	2340	2	4.50	3.50	3.50
3	2345	5	3.60	2.80	2.40
4	10	5	3.60	3.60	4.00
4	20	2	4.00	4.00	3.50
4	225	4	4.00	4.00	3.50
4	470	5	2.40	3.00	3.00
4	495	2	3.00	3.50	3.50
4	520	6	4.00	4.00	3.67
4	995	4	3.75	3.50	3.25
4	1325	9	3.67	3.22	2.22
4	1225	2	4.00	4.00	4.00
4	1330	3	3.33	3.33	4.33
99	1594	1	4.00	4.00	4.00
99	2310	1	3.00	4.00	2.00
99	99999	2	4.50	4.00	4.00

*** PROFILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
0	10	2.50	4.12	2.75	3.06	3.18	3.30	3.40	3.52	3.94	4.00	4.04
0	11	2.00	5.00	2.40	2.82	3.23	3.44	3.55	3.63	3.73	4.02	4.44
0	12	1.50	3.50	2.11	2.40	2.47	2.73	2.80	2.84	2.98	3.24	3.43

*** DECILE PRINT OUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
2	10	2.33	4.50	3.07	3.28	3.53	3.49	3.60	3.83	4.00	4.00	4.30
2	11	1.75	4.50	3.00	3.00	3.19	3.32	3.42	3.68	3.79	3.93	4.00
2	12	1.00	4.00	2.25	2.46	2.67	2.79	3.00	3.14	3.42	3.50	3.82

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
3	10	2.00	5.00	3.04	3.38	3.46	3.60	3.67	3.87	4.00	4.00	4.24
3	11	1.00	5.00	2.60	2.88	3.10	3.22	3.50	3.50	3.74	4.00	4.00
3	12	1.00	4.33	2.03	2.44	2.64	2.96	3.00	3.16	3.50	3.64	4.00

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
4	10	2.80	4.00	2.98	3.27	3.52	3.64	3.71	3.85	4.00	4.00	4.00
4	11	3.00	4.00	3.20	3.31	3.45	3.50	3.55	3.76	4.00	4.00	4.00
4	12	2.22	4.33	2.92	3.20	3.42	3.50	3.50	3.57	3.77	4.00	4.03

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
99	10	3.00	4.50	3.20	3.40	3.60	3.80	4.00	4.10	4.20	4.30	4.40
99	11	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
99	12	2.00	4.00	2.40	2.80	3.20	3.60	4.00	4.00	4.00	4.00	4.00

*** LISTING OF PERCENTILED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
0	350	5		0.71	0.86	0.96
0	355	5		0.43	0.57	0.57
0	1045	1		0.86	1.00	0.71
0	1190	2		0.0	0.0	0.0
0	1185	7		0.14	0.14	0.29
0	1200	8		1.00	0.43	0.14
0	1275	5		0.57	0.29	0.43
0	1285	8		0.25	0.71	1.00
2	75	5		0.52	0.33	0.40
2	155	4		0.43	0.0	0.02
2	178	5		0.79	0.71	0.83
2	250	7		0.83	0.52	0.36
2	285	3		0.90	0.86	1.00
2	345	3		0.31	0.12	0.33
2	370	4		0.55	0.67	0.24
2	410	6		0.21	0.45	0.29
2	425	1		0.81	0.19	0.05
2	520	11		0.17	0.29	0.67
2	605	8		0.67	0.57	0.52
2	665	10		0.57	0.50	0.69
2	790	11		0.05	0.24	0.12
2	850	7		0.14	0.38	0.62
2	970	3		0.0	0.02	0.48
2	1100	5		0.12	0.26	0.57
2	1170	12		0.45	0.21	0.07
2	1250	3		0.93	0.88	0.43
2	1240	6		0.60	0.76	0.21
2	1280	7		0.38	0.62	0.19
2	1300	17		0.10	0.10	0.14
2	1360	6		0.26	0.60	0.90
2	1403	5		0.76	0.90	0.98
2	1455	6		0.62	0.43	0.76
2	1500	3		0.24	0.17	0.31
2	1560	3		0.55	0.93	0.86
2	1600	9		0.71	0.69	0.88
2	1640	1		0.02	0.14	0.0
2	1660	2		0.40	1.00	0.93
2	1695	7		0.69	0.83	0.74
2	1775	5		0.07	0.48	0.55
2	1911	7		0.36	0.07	0.26
2	1961	6		0.48	0.55	0.45
2	1900	4		1.00	0.81	0.38
2	1970	6		0.86	0.79	0.81
2	2025	7		0.64	0.64	0.60
2	2096	6		0.29	0.40	0.79
2	2130	2		0.98	0.98	0.50
2	2165	5		0.50	0.31	0.17
2	2205	7		0.33	0.36	0.71
2	2240	2		0.74	0.55	0.95
2	2271	6		0.88	0.74	0.64
2	2405	4		0.19	0.05	0.10
3	25	5		0.25	0.28	0.34
3	30	4		0.06	0.03	0.09
3	140	2		0.67	0.54	0.75
3	340	4		0.34	0.47	0.47

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
3	400	1		0.03	C.91	0.91
3	475	5		0.56	0.16	0.06
3	480	5		0.53	C.09	0.03
3	500	5		0.13	C.13	0.28
3	525	2		0.0	C.06	0.56
3	595	1		1.00	1.00	0.94
3	900	6		0.72	C.31	0.13
3	965	9		0.16	0.41	0.59
3	1030	6		0.44	C.34	0.81
3	1090	5		0.22	C.44	0.38
3	1095	1		0.09	0.0	0.0
3	1210	3		0.47	0.97	0.66
3	1235	5		0.66	C.88	0.78
3	1240	10		0.41	C.22	0.22
3	1245	8		0.19	C.56	0.16
3	1335	7		0.84	C.72	0.97
3	1345	1		0.63	0.78	0.53
3	1350	3		0.50	C.69	1.00
3	1445	3		0.94	0.75	0.63
3	1665	4		0.91	C.59	C.84
3	1770	5		0.88	C.66	C.88
3	1855	2		0.78	C.63	C.50
3	1960	1		0.81	C.81	0.41
3	2015	9		0.75	C.94	C.72
3	2085	6		0.50	C.50	0.31
3	2190	2		0.31	C.25	0.25
3	2330	5		0.28	C.38	0.44
3	2340	2		0.97	C.69	0.69
3	2345	5		0.38	C.19	0.19
4	10	5		0.33	0.56	0.78
4	20	2		1.00	1.00	0.56
4	235	4		0.78	C.78	0.33
4	470	5		0.0	C.0	0.11
4	495	2		0.11	C.44	0.44
4	520	6		0.67	C.67	0.67
4	955	4		0.56	C.22	0.22
4	1025	9		0.44	0.11	0.0
4	1125	2		0.89	0.89	0.89
4	1330	3		0.22	0.22	1.00
99	1554	1		0.50	0.0	0.50
99	2310	1		0.0	C.50	0.0
99	99999	2		1.00	1.00	1.00

*** LISTING OF NORM EXTREMES BY GROUP
RANK ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 3 GROUP NO. 350 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.714
11	0.857
12	0.857

*** STRATA NO. 3 GROUP NO. 1045 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.714
10	0.857
11	1.000

*** STRATA NO. 3 GROUP NO. 1180 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.0
12	0.0

*** STRATA NO. 3 GROUP NO. 1185 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.143
11	0.143
12	0.286

*** STRATA NO. 3 GROUP NO. 1200 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.142

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000

*** STRATA NO. 0 GROUP NO. 1275 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.266

*** STRATA NO. 0 GROUP NO. 1285 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.286

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.714
12	1.000

*** STRATA NO. 2 GROUP NO. 25 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.333

*** STRATA NO. 2 GROUP NO. 155 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.024

*** STRATA NO. 2 GROUP NO. 17E SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.714
10	0.786
12	0.833

*** STRATA NO. 2 GROUP NO. 25C SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.357

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.833

*** STRATA NO. 2 GROUP NO. 295 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.667
10	0.905
12	1.000

*** STRATA NO. 2 GROUP NO. 345 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.119
10	0.310
12	0.333

*** STRATA NO. 2 GROUP NO. 37C SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.238

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.667

*** STRATA NO. 2 GROUP NO. 410 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.214
12	0.286

*** STRATA NO. 2 GROUP NO. 435 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.048
11	0.190

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.810

*** STRATA NO. 2 GROUP NO. 530 SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.167
11	0.286

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.667

*** STRATA NO. 2 GROUP NO. 635 SAMPLE SIZE = 8

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.467

*** STRATA NO. 2 GROUP NO. 665 SAMPLE SIZE = 19

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.650

*** STRATA NO. 2 GROUP NO. 730 SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.048
12	0.119
11	0.238

*** STRATA NO. 2 GROUP NO. 850 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.143
11	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.619

*** STRATA NO. 2 GROUP NO. 970 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.074

*** STRATA NO. 1 GROUP NO. 11CC SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.119
11	0.262

*** STRATA NO. 2 GROUP NO. 117C SAMPLE SIZE = 12

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.071
11	0.214

*** STRATA NO. 2 GROUP NO. 125C SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.881
10	0.929

*** STRATA NO. 2 GROUP NO. 126C SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.214

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.762

*** STRATA NO. 2 GROUP NO. 129C SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	0.190
10	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.619

*** STRATA NO. 2 GROUP NO. 1300 SAMPLE SIZE = 17

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.095
11	0.095
12	0.143

*** STRATA NO. 2 GROUP NO. 1360 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.262

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.905

*** STRATA NO. 2 GROUP NO. 1403 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.762
11	0.905
12	0.976

*** STRATA NO. 2 GROUP NO. 1455 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.619

12	0.767

*** STRATA NO. 2 GROUP NO. 1500 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.147
10	0.238
12	0.710

*** STRATA NO. 2 GROUP NO. 1560 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.857
11	0.929
10	0.952

*** STRATA NO. 2 GROUP NO. 1600 SAMPLE SIZE = 9

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.450
10	0.714
12	0.881

*** STRATA NO. 2 GROUP NO. 1640 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.024
11	0.143

*** STRATA NO. 2 GROUP NO. 1660 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.999
11	1.000

*** STRATA NO. 2 GROUP NO. 1655 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.650
12	0.738
11	0.833

*** STRATA NO. 2 GROUP NO. 1775 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.071

*** STRATA NO. 2 GROUP NO. 1811 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.071
12	0.262
10	0.357

*** STRATA NO. 2 GROUP NO. 1900 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.381

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.810
10	1.000

*** STRATA NO. 2 GROUP NO. 1970 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.786
12	0.810
10	0.857

*** STRATA NO. 2 GROUP NO. 2025 SAMPLE SIZE = 7

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.643
11	0.643

*** STRATA NO. 2 GROUP NO. 2096 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.286

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.786

*** STRATA NO. 2 GROUP NO. 2130 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.976
11	0.976

*** STRATA NO. 2 GROUP NO. 2166 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.167
11	0.310

*** STRATA NO. 2 GROUP NO. 2205 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.333
11	0.357

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.714

*** STRATA NO. 2 GROUP NO. 2240 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.738
11	0.952
12	0.952

*** STRATA NO. 2 GROUP NO. 2251 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.643
11	0.738
10	0.881

*** STRATA NO. 2 GROUP NO. 2405 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.048
12	0.095
10	0.190

*** STRATA NO. 3 GROUP NO. 25 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.250
11	0.281
12	0.344

*** STRATA NO. 3 GROUP NO. 3C SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.031
10	0.063
12	0.094

*** STRATA NO. 3 GROUP NO. 14C SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.688
12	0.750
11	0.938

*** STRATA NO. 3 GROUP NO. 24C SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.344

*** STRATA NO. 3 GROUP NO. 40C SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.031

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	C.9C6
12	C.9Co

*** STRATA NO. 3 GROUP NO. 475 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.C83
11	0.156

*** STRATA NO. 3 GROUP NO. 48C SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.C81
11	0.C94

*** STRATA NO. 3 GROUP NO. 50C SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.125
11	0.125
12	C.281

*** STRATA NO. 3 GROUP NO. 525 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
1C	0.0
11	C.C63

*** STRATA NO. 3 GROUP NO. 595 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.[illegible]
11	1.000
10	1.000

*** STRATA NO. 3 GROUP NO. 900 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.125
11	0.313

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.719

*** STRATA NO. 3 GROUP NO. 965 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.156

*** STRATA NO. 3 GROUP NO. 1030 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.344

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.813

*** STRATA NO. 3 GROUP NO. 1090 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

	10	0.219
	12	0.375

*** STRATA NO. 3 GROUP NO. 1255 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.0
10	0.094

*** STRATA NO. 3 GROUP NO. 1210 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.656
11	0.906

*** STRATA NO. 3 GROUP NO. 1235 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.656
12	0.781
11	0.875

*** STRATA NO. 3 GROUP NO. 1240 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.219
12	0.219

*** STRATA NO. 3 GROUP NO. 1245 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.156
10	0.188

*** STRATA NO. 3 GROUP NO. 1335 SAMPLE SIZE = 7

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.719
10	0.844
12	0.969

*** STRATA NO. 3 GROUP NO. 1345 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.625
11	0.781

*** STRATA NO. 3 GROUP NO. 1350 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.688
12	1.000

*** STRATA NO. 3 GROUP NO. 1445 SAMPLE SIZE = 3

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.625
11	0.750
10	0.938

*** STRATA NO. 3 GROUP NO. 1555 SAMPLE SIZE = 4

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	C.844
10	C.906

*** STRATA NO. 3 GROUP NO. 1770 SAMPLE SIZE = 5

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.656
10	C.875
12	C.875

*** STRATA NO. 3 GROUP NO. 1855 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.625
10	C.781

*** STRATA NO. 3 GROUP NO. 1960 SAMPLE SIZE = 1

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.813
11	C.813

*** STRATA NO. 3 GROUP NO. 2015 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.719
10	0.750
11	0.844

*** STRATA NO. 3 GROUP NO. 2055 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.313

*** STRATA NO. 3 GROUP NO. 2190 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.250
11	0.250
10	0.313

*** STRATA NO. 3 GROUP NO. 2330 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.281
11	0.375

*** STRATA NO. 3 GROUP NO. 2340 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.688
10	0.969

*** STRATA NO. 3 GROUP NO. 2345 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.188
11	0.188
10	0.375

*** STRATA NO. 4 GROUP NO. 10 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.333

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.778

*** STRATA NO. 4 GROUP NO. 20 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000
11	1.000

*** STRATA NO. 4 GROUP NO. 235 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.333

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.778
11	0.778

*** STRATA NO. 4 GROUP NO. 470 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.0
12	0.111

*** STRATA NO. 4 GROUP NO. 495 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.111

*** STRATA NO. 4 GROUP NO. 520 SAMPLE SIZE = 6

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.667
11	0.667
12	0.667

*** STRATA NO. 4 GROUP NO. 845 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.222
11	0.333

*** STRATA NO. 4 GROUP NO. 1025 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.111

*** STRATA NO. 4 GROUP NO. 1225 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.889
11	0.889
12	0.889

*** STRATA NO. 4 GROUP NO. 1330 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.222
11	0.333

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	1.000

*** STRATA NO. 99 GROUP NO. 1554 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0

*** STRATA NO. 99 GROUP NO. 2910 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.0

*** STRATA NO. 99 GROUP NO.99999 SAMPLE SIZE = 2

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000
11	1.000
12	1.000

*****STEP COST = $ 7.57

INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM 02/01/74

*****LISTING OF SETUP FELLOWS:

```
CARD                1         2         3         4         5         6         7         8
 NO.    12345678901234567890123456789012345678901234567890123456789012345678901234567890
   1    RRUN NORM
   2    TEST RUN
   3    GVAR=3 SVAR=6 DEC1 INFILE=IN1 NORM *
   4    V10-V12 *
   5    RENDFILE
```

PROGRAM NCSS OCTOBER 1974

GVAR=3 SVAR=6 LEGI INFILE=IN1 NORM *

THE VARIABLE LIST IS:

V1C-V12 *

	VAR.	TYPE	VARIABLE NAME	FLOC	WIDTH	NODEC	RESP.	MDCODE1	MDCODE2	REFNO	ID	TSLNNO
T	3	0	WORK GROUP NO.	10	5	0	1	0099999				00000
T	8	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	10	0	10 CO HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000006			00000

```
*** PARAMETER SPECIFICATION

 STRATA VARIABLE IS :     2-DIGIT CLASS          VARIABLE NO.    6
 GROUP VARIABLE IS :      WORK GROUP NO.         VARIABLE NO.    3
 MINIMUM PERCENTILE IS THE 40TH

 MAXIMUM PERCENTILE IS THE 60TH
 DECILE PRINT-OUT REQUESTED
 PERCENTILED NORMS MODE
 NORM DATA SET
 BAD DATA WILL TERMINATE RUN
 EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
     SAMPLE SIZE =  125
     NO.OF STRATA =  5
     NO.OF GROUPS = 17

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 =    0

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 =    0

*** FINAL NO. OF CASES FOR ANALYSIS =  125
```

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12
1	33110	14	3.21	2.71	2.50
1	33120	18	2.89	2.00	1.89
1	33130	14	2.57	2.07	2.00
1	33140	4	3.50	3.00	3.00
1	33150	7	2.00	2.43	2.00
1	33210	8	3.50	2.75	2.62
1	33220	13	3.46	2.77	1.54
1	33230	15	3.13	2.33	2.00
2	32100	3	3.67	3.67	3.00
2	33100	4	3.25	2.75	2.00
2	33200	5	3.00	2.40	2.20
2	33300	1	4.00	3.00	3.00
3	21000	5	3.20	2.40	2.40
3	22000	8	4.00	3.62	3.12
3	23000	2	2.50	3.00	2.00
4	10010	3	3.67	4.33	3.33
99	99999	1	5.00	4.00	3.00

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
1	10	2.57	3.50	2.75	2.84	2.88	3.CA	3.17	3.26	3.44	3.49	3.50
1	11	2.CC	3.00	2.05	2.14	2.26	2.32	2.3A	2.49	2.69	2.75	2.84
1	12	1.54	3.00	1.78	1.93	2.00	2.00	2.00	2.10	2.45	2.57	2.74

*** LEGILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
2	10	3.00	4.00	3.07	3.15	3.22	3.33	3.46	3.58	3.70	3.80	3.90
2	11	2.75	3.67	2.76	2.78	2.79	2.84	2.90	2.96	3.07	3.27	3.47
2	12	2.00	3.00	2.06	2.12	2.18	2.36	2.60	2.84	3.00	3.00	3.00

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
3	10	2.50	4.00	2.64	2.78	2.92	3.06	3.20	3.36	3.52	3.68	3.84
3	11	2.40	3.42	2.52	2.64	2.76	2.88	3.00	3.12	3.25	3.37	3.50
3	12	2.80	3.12	2.84	2.88	2.92	2.96	3.00	3.02	3.05	3.07	3.10

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
4	10	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67	3.67
4	11	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33	4.33
4	12	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33	3.33

*** DECILE PRINTOUT

STRATA	VARIABLE	MINIMUM	MAXIMUM	1	2	3	4	5	6	7	8	9
99	10	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
99	11	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
99	12	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00

*** LISTING OF PERCENTILES MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12
1	33110	14		0.25	0.17	0.31
1	33120	19		0.13	0.0	0.36
1	33130	14		0.03	0.02	0.08
1	33140	4		0.53	0.24	0.71
1	33150	7		0.13	0.11	0.08
1	33210	9		0.59	0.06	0.36
1	33220	13		0.55	0.19	0.01
1	33230	15		0.22	0.08	0.38
2	33100	3		0.53	0.60	0.50
2	33100	4		0.18	0.08	0.08
2	33200	5		0.09	0.08	0.10
2	33300	1		0.70	0.10	0.50
3	21000	5		0.15	0.09	0.35
3	22000	3		0.70	0.65	0.58
3	23000	2		0.05	0.25	0.50
4	10010	3		0.44	1.00	0.26
99	99999	1		1.00	0.0	0.25

*** LISTING OF NORM EXTREMES BY GROUP
RANK ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 1 GROUP NO.33110 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.174
10	0.248
12	0.313

*** STRATA NO. 1 GROUP NO.33120 SAMPLE SIZE = 18

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.063
10	0.127

*** STRATA NO. 1 GROUP NO.33130 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.018
10	0.029
12	0.082

*** STRATA NO. 1 GROUP NO.33140 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.244

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.709

*** STRATA NO. 1 GROUP NO.33150 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.092
11	0.107
10	0.134

*** STRATA NO. 1 GROUP NO.33210 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.063
12	0.361

*** STRATA NO. 1 GROUP NO.33220 SAMPLE SIZE = 13

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.006
11	0.187

*** STRATA NO. 1 GROUP NO.33230 SAMPLE SIZE = 15

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.082
11	0.093
10	0.222

*** STRATA NO. 2 GROUP NO.33100 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.080
11	0.080
10	0.184

*** STRATA NO. 2 GROUP NO.33200 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.CP4
10	C.C91
12	C.C96

*** STRATA NO. 2 GROUP NO.33300 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.3C0

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.7C0

*** STRATA NO. 3 GROUP NO.21C00 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.C87
10	0.146
12	0.350

*** STRATA NO. 3 GROUP NO.22000 SAMPLE SIZE = 8

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.451
10	0.7C0

*** STRATA NO. 3 GROUP NO.23CCC SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.04P
11	C.255

*** STRATA NO. 4 GROUP NO.10010 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.259

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	1.000

*** STRATA NO. 39 GROUP NO.99999 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	C.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	1.000

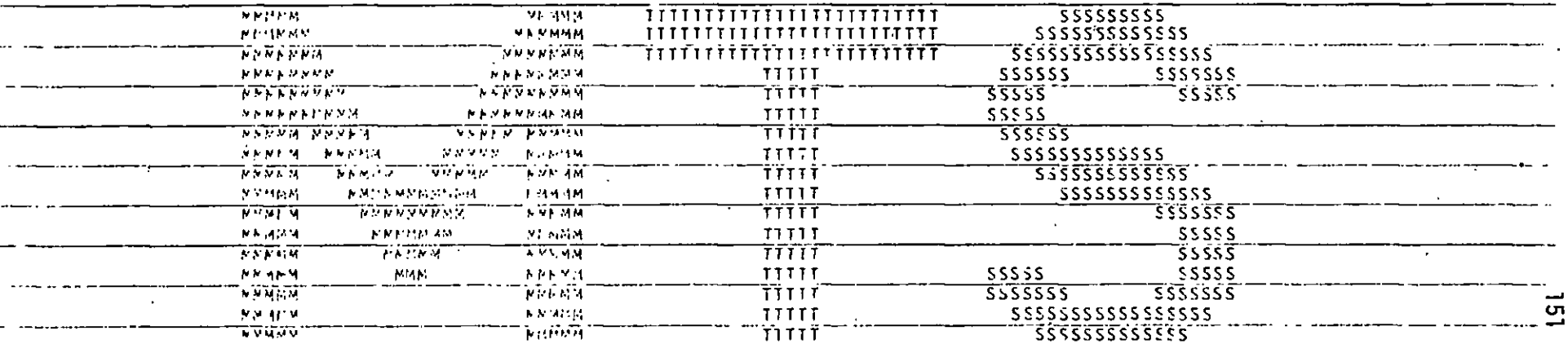
*****STEP COST = $ 1.14

*****NO MORE RUN CARDS; TOTAL COST = $ 5.02

JOB NO. 693821   UNIVERSITY OF MICHIGAN TERMINAL SYSTEM   (MODEL CT124)   10:44.05   WED OCT 16/74

```
  6666666666    9999999999    3333333333    8888888888    2222222222      11
 666666666666  999999999999  333333333333  888888888888  222222222222    111
 66        66  99        99  33        33  88        88  22        22   1111
 66            99        99            33  88        88            22     11
 66            99        99            33  88        88            22     11
 66666666666   999999999999          3333   8888888888            22      11
 666666666666   99999999999          3333   8888888888          22        11
 66        66            99            33  88        88        22         11
 66        66            99            33  88        88      22           11
 66        66  99        99  33        33  88        88    22             11
 666666666666  999999999999  333333333333  888888888888  222222222222  1111111111
  6666666666    9999999999    3333333333    8888888888   222222222222  1111111111


  SSSSSSSSSS   DDDDDDDDD    HH        HH  TTTTTTTTTTTT
 SSSSSSSSSSSS  DDDDDDDDDD   HH        HH  TTTTTTTTTTTT
 SS        SS  DD       DD  HH        HH       TT
 SS            DD       DD  HH        HH       TT
 SSS           DD       DD  HH        HH       TT
  SSSSSSSSS    DD       DD  HHHHHHHHHHHH       TT
   SSSSSSSSS   DD       DD  HHHHHHHHHHHH       TT
          SSS  DD       DD  HH        HH       TT
           SS  DD       DD  HH        HH       TT
 SS        SS  DD       DD  HH        HH       TT
 SSSSSSSSSSSS  DDDDDDDDDD   HH        HH       TT
  SSSSSSSSSS   DDDDDDDDD    HH        HH       TT
```



***** IC-CB-74 DUE TO MTS HARDWARE PROBLEMS, THE PROGRAMS MMP, NTILL, REGP, AND *****
***** SCRMER WERE TEMPORARILY UNAVAILABLE. THEY SHOULD NOW ALL BE O-KAY *****

INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM 02/01/74

*****LISTING OF SETUP FOLLOWS:

```
CARD                1         2         3         4         5         6         7         8
 NO.    1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678890
   1    &RUN NORM
   2    TEST RUN
   3    GVAR=? SVAR=6   PRED STAN*
   4    V10-V16*
   5    &ENDFILE
```

PROGRAM NOPM OCTOBER 1974

GVAR=3 SVAR=6 PREC STAN*

THE VARIABLE LIST IS:

V10-V16*

	VAR.	TYPE	VARIABLE NAME	LOC	WIDTH	DECEC	RESP.	MCCODE1	MCCODE2	REFNO	ID	TSEQNO
T	3	C	WORK GROUP NO.	10	5	0	1	0099999				00000
T	6	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	10	0	10 CO HAS CLEAR GOALS	33	1	C	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	C	12 YOU GET DTF UNIT INFC	35	1	0	1	0000009	0000006			00000
T	13	0	13 SUPS OPEN TO IDEAS	36	1	0	1	0000009	0000006			00000
T	14	0	14 TOLD ENOUGH TO DO JOB	37	1	0	1	0000009	0000006			00000
T	15	0	15 YOU FEEL LOYAL TO CO	38	1	0	1	0000009	0000006			00000
T	16	C	16 DISAGREMTS WKED THRU	39	1	C	1	0000009	0000006			00000

*** PARAMETER SPECIFICATION

STRATA VARIABLE IS : 2-DIGIT CLASS VARIABLE NO. 6
GROUP VARIABLE IS : WORK GROUP NO. VARIABLE NO. 3
MINIMUM PERCENTILE IS THE 40TH

MAXIMUM PERCENTILE IS THE 60TH
PREDICTED CRITERION SCORE MODE
MASTER DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
SAMPLE SIZE = 480
NO.OF STRATA = 5
NO.OF GROUPS = 96

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 = 11

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 = 0

*** FINAL NO. OF CASES FOR ANALYSIS = 469

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15	16
0	350	5	4.00	4.20	3.40	4.40	3.80	5.00	3.80
0	355	5	3.40	3.60	2.80	3.40	3.60	4.40	3.20
0	1045	1	4.00	5.00	3.00	4.00	4.00	5.00	4.00
0	1180	2	2.50	2.00	1.50	3.50	2.50	4.50	4.00
0	1185	7	2.86	2.57	2.43	2.43	2.43	3.14	2.71
0	1200	8	4.12	3.50	2.37	3.25	4.12	4.50	3.62
0	1275	5	3.40	3.20	2.80	3.40	3.20	4.00	2.80
0	1285	8	3.37	3.75	3.50	3.25	3.37	3.75	3.75
2	75	5	3.00	3.20	2.80	3.20	3.20	3.60	3.40
2	155	4	3.50	1.75	2.00	2.25	1.75	4.00	3.00
2	175	5	4.00	3.60	3.60	4.40	4.20	4.80	4.00
2	250	7	4.00	3.43	2.71	3.86	3.86	4.43	3.57
2	285	3	4.33	4.00	4.00	3.67	3.67	4.67	4.33
2	345	3	3.33	3.00	2.67	2.67	3.00	3.33	3.67
2	370	4	3.75	3.75	2.50	3.50	3.50	4.50	3.50
2	410	6	3.33	3.33	2.67	2.83	2.83	4.00	3.33
2	435	1	4.00	3.00	2.00	3.00	2.00	4.00	4.00
2	530	11	3.18	3.18	3.18	2.64	3.36	3.45	3.36
2	605	7	3.86	3.57	3.00	3.43	3.57	4.43	3.57
2	665	19	3.79	3.42	3.42	3.53	3.37	4.32	3.58
2	730	10	2.90	3.00	2.20	2.50	2.90	3.80	2.90
2	850	7	3.14	3.29	3.14	3.57	3.57	3.57	3.43
2	970	3	2.33	2.33	3.00	1.67	2.00	2.33	2.67
2	1100	8	3.00	3.25	3.37	2.25	3.50	3.00	2.75
2	1170	12	3.50	3.00	2.17	1.92	2.58	3.83	3.08
2	1250	3	4.33	4.00	3.00	3.00	2.67	4.00	3.33
2	1260	6	3.83	3.83	2.50	3.83	3.50	4.17	3.33
2	1280	7	3.43	3.71	2.43	3.00	3.00	4.43	3.71
2	1300	17	3.06	3.00	2.29	2.65	2.76	3.71	3.00
2	1360	6	3.33	3.67	3.83	3.33	3.50	4.00	3.67
2	1403	5	4.00	4.00	4.00	3.60	4.00	4.40	3.40
2	1455	6	3.83	3.33	3.50	3.17	3.67	4.00	4.00
2	1500	3	3.33	3.00	2.67	2.67	3.33	3.67	4.00
2	1560	3	4.33	4.33	3.67	4.67	4.33	5.00	4.33
2	1600	9	4.00	3.78	3.78	4.00	4.11	4.44	3.44
2	1640	1	3.00	3.00	1.00	2.00	2.00	3.00	3.00
2	1660	2	3.50	4.50	4.00	4.00	4.00	4.00	4.50
2	1695	2	4.00	4.00	3.50	4.50	4.00	5.00	4.50
2	1775	5	3.00	3.40	3.00	3.40	2.60	4.40	4.00
2	1811	7	3.43	2.86	2.57	2.43	2.71	3.86	3.57
2	1961	6	3.50	3.50	3.00	3.17	3.67	4.33	3.00
2	1990	4	4.50	4.00	2.75	3.50	3.50	5.00	4.50
2	1970	6	4.17	3.83	3.50	4.00	4.17	4.67	4.50
2	2025	6	3.83	3.50	3.00	3.33	3.50	4.00	3.67
2	2096	6	3.83	3.33	3.50	3.67	3.67	3.67	3.67
2	2130	2	4.50	4.50	3.00	4.50	4.50	5.00	4.50
2	2165	5	3.60	3.20	2.40	2.60	2.60	3.60	3.80
2	2205	6	3.17	3.17	3.33	3.33	3.50	3.67	3.17
2	2240	2	4.00	4.50	4.00	5.00	4.50	5.00	3.50
2	2291	6	4.17	3.83	3.17	3.17	3.67	4.67	4.00
3	2405	4	3.25	2.75	2.25	3.00	2.75	3.00	4.25
3	25	5	3.40	3.80	2.80	3.20	2.80	4.60	3.40
3	30	4	2.50	1.50	2.00	2.25	1.75	2.00	3.00
3	140	2	4.00	4.00	3.50	4.00	3.50	4.50	3.50
3	240	4	3.50	3.50	3.00	3.50	3.75	4.00	3.75

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15	16
3	475	5	3.80	2.00	2.00	3.00	3.00	3.40	2.80
3	480	5	3.00	2.40	1.20	2.40	2.40	3.20	3.00
3	510	5	3.20	2.60	2.60	3.20	3.00	4.00	2.20
3	525	2	2.00	3.00	3.00	3.00	3.00	4.00	3.50
3	595	1	5.00	5.00	4.00	4.00	4.00	5.00	2.00
3	900	6	4.00	3.17	2.17	2.83	3.33	3.50	3.17
3	965	9	3.22	3.22	3.11	3.22	3.00	4.11	3.44
3	1030	6	3.67	3.17	3.67	4.00	4.17	4.33	4.33
3	1060	5	3.40	3.40	2.80	3.20	3.60	4.40	3.20
3	1095	1	3.00	1.00	1.00	2.00	1.00	4.00	2.00
3	1210	3	3.67	4.33	3.33	3.67	4.33	5.00	3.33
3	1235	5	4.00	4.00	3.60	3.80	3.80	4.20	3.60
3	1240	10	3.60	3.00	2.50	3.10	3.10	4.00	3.60
3	1245	8	3.37	3.50	2.37	2.87	3.12	4.00	3.37
3	1335	7	4.14	3.86	4.14	3.86	4.14	5.00	3.57
3	1345	1	4.00	4.00	3.00	3.00	4.00	5.00	3.00
3	1350	3	3.67	3.67	4.33	3.67	4.33	5.00	4.33
3	1445	3	4.33	4.00	3.33	4.00	4.33	4.67	3.33
3	1595	4	4.25	3.50	3.75	3.75	4.25	4.25	3.50
3	1770	5	4.20	3.60	4.00	3.60	4.00	4.80	3.60
3	1855	2	4.00	3.50	3.00	3.50	3.50	4.50	3.50
3	1960	1	4.00	4.00	3.00	5.00	5.00	5.00	5.00
3	2015	2	4.00	4.00	3.50	4.00	4.00	5.00	3.50
3	2085	6	3.83	3.50	2.67	3.50	3.33	4.17	4.00
3	2180	2	3.50	3.00	2.50	3.00	2.50	4.00	2.50
3	2330	5	3.40	3.20	3.00	3.40	3.20	3.80	3.20
3	2340	1	5.00	4.00	4.00	5.00	4.00	4.00	5.00
3	2345	5	3.60	2.80	2.40	2.80	3.20	3.40	3.00
4	10	5	3.60	3.60	4.00	3.80	3.80	4.60	4.20
4	30	1	4.00	4.00	4.00	4.00	4.00	5.00	4.00
4	235	4	4.00	4.00	3.50	4.00	3.00	4.50	4.00
4	470	5	2.80	3.00	3.00	2.80	3.20	3.40	3.20
4	495	2	3.00	3.50	3.50	3.00	2.50	4.50	3.50
4	520	6	4.00	4.00	3.67	4.17	4.33	4.50	4.00
4	885	4	3.75	3.50	3.25	3.75	3.50	3.75	4.00
4	1025	9	3.67	3.22	2.22	2.89	3.22	3.89	3.00
4	1225	2	4.00	4.00	4.00	5.00	4.00	5.00	4.50
4	1330	3	3.33	3.33	4.33	4.00	3.67	4.67	3.67
99	1554	1	4.00	4.00	4.00	4.00	4.00	5.00	3.00
99	2910	1	3.00	4.00	2.00	3.00	3.00	3.00	3.00
99	99999	2	4.50	4.00	4.00	3.50	3.50	4.50	4.50

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
0	350	5		1.01	0.83	1.13	1.75	0.70	1.21	0.65
0	355	5		-0.11	0.14	0.12	-0.10	0.37	0.19	-0.59
0	1045	1		1.01	1.76	0.46	1.01	1.04	1.21	1.06
0	1190	2		-1.73	-1.70	-2.05	0.09	-1.47	0.36	1.06
0	1185	7		-1.11	-1.05	-0.50	-1.90	-1.58	-1.93	-1.60
0	1200	3		1.24	0.03	-0.59	-0.38	1.24	0.36	0.29
0	1275	5		-0.11	-0.32	0.12	-0.10	-0.30	-0.46	-1.42
0	1295	9		-0.15	0.31	1.30	-0.38	-0.01	-0.91	0.55
2	75	5		-0.06	-0.47	-0.28	-0.09	-0.19	-0.76	-0.48
2	155	4		-0.27	-3.08	-1.52	-1.35	-2.32	-0.10	-1.27
2	178	5		0.73	0.61	0.76	1.52	1.28	1.21	0.72
2	250	7		0.78	-0.06	-0.41	0.73	0.78	0.60	-0.13
2	285	3		1.47	0.97	1.58	0.54	0.50	0.99	1.38
2	345	3		-0.61	-0.83	-0.48	-0.80	-0.48	-1.20	0.05
2	370	4		0.26	0.52	-0.74	0.31	0.25	0.72	-0.28
2	410	5		-0.61	-0.23	-0.48	-0.56	-0.73	-0.10	-0.61
2	435	1		0.78	-0.93	-1.52	-0.35	-1.95	-0.10	0.72
2	530	11		-0.95	-0.50	0.32	-0.84	0.05	-1.00	-0.55
2	605	7		0.48	0.20	0.05	0.22	0.36	0.60	-0.13
2	665	14		0.34	-0.07	0.59	0.35	0.06	0.41	-0.12
2	700	10		-1.52	-0.83	-1.21	-1.02	-0.63	-0.43	-1.47
2	850	7		-1.01	-0.52	0.25	0.41	0.36	-0.81	-0.42
2	970	3		-2.70	-2.03	0.03	-2.13	-1.95	-2.85	-1.93
2	1100	8		-1.31	-0.38	0.62	-1.35	0.25	-1.75	-1.77
2	1170	12		-0.27	-0.93	-1.26	-1.80	-1.09	-0.38	-1.10
2	1250	3		1.47	0.97	0.03	-0.35	-0.97	-0.10	-0.61
2	1260	6		0.43	0.67	-0.74	0.76	0.25	0.17	-0.61
2	1280	7		-0.42	0.46	-0.95	-0.35	-0.48	0.60	0.15
2	1300	17		-1.19	-0.83	-1.06	-0.82	-0.83	-0.59	-1.27
2	1360	6		-0.61	0.37	1.35	0.09	0.25	-0.10	0.05
2	1403	5		0.79	0.97	1.58	0.45	0.99	0.55	-0.48
2	1485	6		0.43	-0.23	0.81	-0.13	0.50	-0.10	0.72
2	1500	9		-0.61	-0.83	-0.48	-0.80	0.01	-0.65	0.72
2	1540	3		1.47	1.57	1.07	1.87	1.48	1.54	1.38
2	1600	9		0.78	0.67	1.24	0.98	1.15	0.63	-0.35
2	1640	1		-1.31	-0.83	-3.07	-1.69	-1.95	-1.75	-1.27
2	1660	2		-0.27	1.97	1.58	0.98	0.99	-0.10	1.71
2	1695	2		0.78	0.97	0.81	1.65	0.99	1.54	1.71
2	1775	5		-1.31	-0.11	0.03	0.18	-1.07	0.55	0.72
2	1811	7		-0.42	-1.09	-0.63	-1.12	-0.90	-0.34	-0.13
2	1841	6		-0.27	0.07	0.03	-0.13	0.50	0.44	-1.27
2	1910	4		1.42	0.97	-0.35	0.31	0.25	1.54	1.71
2	1970	6		1.13	0.67	0.81	0.98	1.23	0.99	1.71
2	2025	6		0.43	0.07	0.03	0.09	0.25	-0.10	0.05
2	2096	6		-0.61	-0.23	0.81	0.54	0.50	-0.65	0.05
2	2130	2		1.82	1.87	0.03	1.65	1.72	1.54	1.71
2	2166	5		-0.06	-0.47	-0.90	-0.89	-1.07	-0.76	0.32
2	2205	6		-0.56	-0.53	0.55	0.09	0.25	-0.65	-0.94
2	2240	2		0.78	1.87	1.58	2.32	1.72	1.54	-0.28
2	2291	6		1.13	0.67	0.29	-0.13	0.50	0.99	0.72
2	2405	4		-0.79	-1.28	-1.13	-0.35	-0.85	-1.75	1.21
3	26	5		-0.55	-0.41	-0.23	-0.33	-0.81	0.59	0.03
3	30	4		-2.09	-2.30	-1.25	-1.78	-2.12	-2.40	-0.56
3	140	2		0.48	0.65	0.67	0.89	0.06	0.44	0.17
3	240	4		-0.38	0.22	0.03	0.13	0.37	-0.33	0.54

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
3	475	5		0.14	-0.66	-1.25	-0.64	-0.56	-1.25	-0.86
3	480	5		0.14	-0.91	-2.27	-1.55	-1.31	-1.56	-0.56
3	500	5		-0.89	-0.91	-0.48	-0.33	-0.56	-0.33	-1.74
3	525	2		-2.64	-1.67	0.03	-0.64	-0.56	-0.33	0.17
3	595	1		2.19	2.11	1.30	0.89	0.68	1.21	-2.03
3	600	6		0.49	-0.20	-1.03	-0.89	-0.15	-1.10	-0.32
3	665	9		-0.85	-0.13	0.17	-0.30	-0.56	-0.16	0.09
3	1080	6		-0.09	-0.20	0.88	0.89	0.89	0.18	1.40
3	1090	5		-0.55	0.09	-0.23	-0.33	0.18	0.29	-0.27
3	1095	1		-1.23	-2.93	-2.52	-2.16	-3.05	-0.33	-2.03
3	1210	3		-0.09	1.27	0.45	0.38	1.10	1.21	-0.07
3	1235	5		0.48	0.85	0.79	0.59	0.43	-0.02	0.32
3	1240	10		-0.21	-0.41	-0.61	-0.48	-0.44	-0.33	0.32
3	1245	8		-0.59	0.22	-0.77	-0.93	-0.41	-0.33	-0.01
3	1335	7		0.72	0.67	1.49	0.67	0.86	1.21	0.28
3	1345	1		0.48	0.85	0.03	-0.64	0.68	1.21	-0.56
3	1350	3		-0.09	0.43	1.73	0.38	1.10	1.21	1.40
3	1445	3		1.05	0.85	0.45	0.89	1.10	0.70	-0.07
3	1595	4		0.90	0.22	0.98	0.51	0.99	0.06	0.17
3	1770	5		0.82	0.35	1.30	0.28	0.68	0.90	0.32
3	1855	2		0.48	0.22	0.03	0.13	0.06	0.44	0.17
3	1960	1		0.49	0.85	0.03	2.42	1.93	1.21	2.37
3	2015	2		0.49	0.85	0.67	0.89	0.68	1.21	0.17
3	2085	6		0.19	0.22	-0.40	0.13	-0.15	-0.07	0.91
3	2190	2		-0.38	-0.41	-0.61	-0.64	-1.18	-0.33	-1.30
3	2330	5		-0.55	-0.16	0.03	-0.02	-0.31	-0.44	-0.27
3	2340	1		2.19	0.85	1.30	2.42	0.68	-0.33	2.37
3	2345	5		-0.21	-0.66	-0.74	-0.94	-0.31	-1.25	-0.56
4	10	5		-0.04	-0.04	0.78	0.09	0.45	0.44	0.90
4	70	1		0.92	1.10	0.78	0.40	0.95	1.23	0.44
4	235	4		0.92	1.10	-0.08	0.40	-1.57	0.24	0.44
4	470	5		-1.96	-1.75	-0.84	-1.46	-1.06	-1.95	-1.39
4	495	2		-1.44	-0.32	-0.08	-1.15	-0.31	0.24	-0.70
4	520	5		0.92	1.10	0.20	0.66	1.79	0.24	0.44
4	895	4		0.32	-0.33	-0.51	0.01	-0.31	-1.25	0.44
4	1025	1		0.12	-1.12	-2.27	-1.32	-1.01	-0.98	-1.84
4	1225	2		0.92	1.10	0.78	1.96	0.95	1.23	1.58
4	1330	1		-0.64	-0.80	1.05	0.40	0.11	0.57	-0.32
99	1554	1		0.27	0.0	0.71	1.22	1.22	0.98	-0.71
99	2910	1		-1.34	0.0	-1.41	-1.22	-1.22	-1.37	-0.71
99	99999	2		1.07	0.0	0.71	0.0	0.0	0.39	1.41

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
0	350	5		0.26	0.29	0.02	1.14	0.27	0.86	0.65
0	355	5		-0.03	0.06	0.00	-0.06	0.14	0.14	-0.59
0	1045	1		0.26	0.62	0.01	0.66	0.40	0.86	1.06
0	1180	2		-0.47	-0.60	-0.03	0.06	-0.57	0.26	1.06
0	1185	7		-0.29	-0.37	-0.01	-1.24	-0.61	-1.38	-1.60
0	1200	8		0.33	0.01	-0.01	-0.25	0.48	0.26	0.29
0	1275	5		-0.03	-0.11	0.00	-0.06	-0.12	-0.35	-1.42
0	1285	8		-0.04	0.11	0.02	-0.25	-0.00	-0.65	0.55
2	75	5		-0.04	-0.26	-0.09	-0.05	-0.09	-0.44	-0.48
2	155	4		-0.17	-1.71	-0.52	-0.83	-1.08	-0.04	-1.27
2	175	5		0.49	0.24	0.33	0.93	0.60	0.69	0.72
2	250	7		0.48	-0.03	-0.14	0.48	0.36	0.34	-0.13
2	285	3		0.91	0.54	0.54	0.33	0.23	0.57	1.38
2	345	3		-0.38	-0.46	-0.17	-0.49	-0.22	-0.69	0.05
2	370	4		0.16	0.29	-0.25	0.19	0.12	0.41	-0.28
2	410	5		-0.38	-0.13	-0.17	-0.35	-0.34	-0.06	-0.61
2	485	1		0.48	-0.46	-0.52	-0.22	-0.91	-0.06	0.72
2	530	11		-0.58	-0.29	0.11	-0.51	0.02	-0.57	-0.55
2	605	7		0.30	0.11	0.01	0.13	0.17	0.34	-0.13
2	665	13		0.21	-0.04	0.24	0.21	0.03	0.24	-0.12
2	790	10		-0.94	-0.46	-0.41	-0.63	-0.29	-0.25	-1.47
2	850	7		-0.63	-0.18	0.09	0.25	0.17	-0.46	-0.42
2	970	3		-1.69	-1.13	0.01	-1.31	-0.91	-1.63	-1.93
2	1100	9		-0.81	-0.21	0.21	-0.83	0.12	-1.00	-1.77
2	1170	12		-0.17	-0.46	-0.43	-1.10	-0.51	-0.22	-1.10
2	1250	3		0.91	0.54	0.01	-0.22	-0.45	-0.06	-0.61
2	1260	6		0.27	0.37	-0.25	0.47	0.12	0.10	-0.61
2	1280	7		-0.26	0.25	-0.29	-0.22	-0.22	0.34	0.15
2	1300	17		-0.74	-0.46	-0.36	-0.51	-0.38	-0.34	-1.27
2	1360	6		-0.38	0.21	0.45	0.06	0.12	-0.06	0.05
2	1403	5		0.48	0.54	0.54	0.27	0.46	0.32	-0.48
2	1455	6		0.27	-0.13	0.28	-0.08	0.23	-0.06	0.72
2	1500	3		-0.38	-0.46	-0.17	-0.49	0.00	-0.37	0.72
2	1560	3		0.91	0.87	0.37	1.15	0.69	0.88	1.38
2	1600	9		0.48	0.32	0.42	0.60	0.54	0.36	-0.39
2	1640	1		-0.81	-0.46	-1.05	-1.03	-0.91	-1.00	-1.27
2	1660	2		-0.17	1.04	0.54	0.60	0.46	-0.06	1.71
2	1695	2		0.48	0.54	0.28	1.01	0.46	0.88	1.71
2	1775	5		-0.81	-0.06	0.01	0.11	-0.50	0.32	0.72
2	1811	7		-0.26	-0.60	-0.22	-0.68	-0.42	-0.19	-0.13
2	1961	6		-0.17	0.04	0.01	-0.08	0.23	0.25	-1.27
2	1980	4		1.13	0.54	-0.12	0.19	0.12	0.88	1.71
2	1970	6		0.70	0.37	0.28	0.60	0.57	0.57	1.71
2	2025	6		0.27	0.04	0.01	0.06	0.12	-0.06	0.05
2	2096	6		-0.38	-0.13	0.28	0.33	0.23	-0.37	0.05
2	2130	2		1.13	1.04	0.01	1.01	0.80	0.88	1.71
2	2160	5		-0.04	-0.26	-0.31	-0.54	-0.50	-0.44	0.32
2	2205	4		-0.60	-0.29	0.19	0.06	0.12	-0.37	-0.54
2	2240	2		0.48	1.04	0.54	1.42	0.80	0.88	-0.28
2	2291	5		0.70	0.37	0.10	-0.08	0.23	0.57	0.72
2	2405	4		-0.49	-0.71	-0.39	-0.22	-0.39	-1.00	1.21
3	25	5		-0.13	-0.14	-0.11	-0.22	-0.48	0.15	0.03
3	30	4		-0.48	-0.80	-0.61	-1.20	-1.26	-0.85	-0.56
3	140	2		0.11	0.30	0.32	0.60	0.04	0.11	0.17
3	240	4		-0.09	0.08	0.01	0.09	0.22	-0.08	0.54

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15	16
3	475	5		0.03	-0.23	-0.61	-0.43	-0.34	-0.21	-0.86
3	480	5		0.03	-0.32	-1.11	-1.05	-0.78	-0.39	-0.56
3	500	5		-0.21	-0.22	-0.23	-0.22	-0.34	-0.08	-1.74
3	525	2		-0.68	-0.58	0.01	-0.43	-0.34	-0.08	0.17
3	595	1		0.50	0.74	0.64	0.60	0.41	0.30	-2.03
3	600	6		0.11	-0.07	-0.50	-0.60	-0.09	-0.27	-0.32
3	665	9		-0.20	-0.05	0.08	-0.20	-0.34	-0.04	0.09
3	1030	6		-0.02	-0.07	0.43	0.60	0.53	0.05	1.40
3	1050	5		-0.13	0.03	-0.11	-0.22	0.11	0.07	-0.27
3	1095	1		-0.28	-1.02	-1.23	-1.46	-1.82	-0.08	-2.03
3	1210	3		-0.02	0.44	0.22	0.26	0.65	0.30	-0.07
3	1235	5		0.11	0.30	0.39	0.40	0.26	-0.01	0.32
3	1240	10		-0.05	-0.14	-0.30	-0.33	-0.26	-0.08	0.32
3	1245	8		-0.14	0.08	-0.37	-0.56	-0.24	-0.08	-0.01
3	1335	7		0.17	0.23	0.72	0.45	0.51	0.30	0.28
3	1345	1		0.11	0.30	0.01	-0.43	0.41	0.30	-0.56
3	1350	3		-0.02	0.15	0.94	0.26	0.65	0.30	1.40
3	1445	3		0.24	0.30	0.22	0.60	0.65	0.17	-0.07
3	1595	4		0.21	0.08	0.48	0.34	0.59	0.01	0.17
3	1770	5		0.19	0.12	0.64	0.19	0.41	0.23	0.32
3	1855	2		0.11	0.08	0.01	0.09	0.04	0.11	0.17
3	1960	1		0.11	0.30	0.01	1.63	1.15	0.30	2.37
3	2015	2		0.11	0.30	0.32	0.60	0.41	0.30	0.17
3	2085	6		0.04	0.08	-0.19	0.09	-0.09	-0.02	0.91
3	2190	2		-0.05	-0.14	-0.30	-0.43	-0.71	-0.08	-1.30
3	2330	5		-0.13	-0.06	0.01	-0.02	-0.19	-0.16	-0.27
3	2340	1		0.50	0.30	0.64	1.63	0.41	-0.08	2.37
3	2345	5		-0.05	-0.23	-0.36	-0.63	-0.19	-0.31	-0.56
4	10	5		-0.02	-0.04	0.56	0.08	0.26	0.29	0.90
4	20	1		0.60	0.87	0.56	0.36	0.55	0.82	0.44
4	235	4		0.60	0.87	-0.06	0.36	-0.91	0.16	0.44
4	470	5		-1.23	-1.40	-0.68	-1.31	-0.62	-1.30	-1.39
4	495	2		-0.96	-0.26	-0.06	-1.04	-0.18	0.16	-0.70
4	820	6		0.60	0.87	0.15	0.60	1.04	0.16	0.44
4	895	4		0.21	-0.26	-0.37	0.01	-0.18	-0.84	0.44
4	1025	9		0.08	-0.89	-1.64	-1.19	-0.58	-0.65	-1.84
4	1295	2		0.60	0.87	0.56	1.76	0.55	0.82	1.58
4	1330	3		-0.44	-0.64	0.97	0.36	0.06	0.38	-0.32
99	1554	1		0.20	0.0	0.35	0.0	0.0	0.27	-0.71
99	2010	1		-1.01	0.0	-0.71	0.0	0.0	-0.38	-0.71
99	99999	2		0.81	0.0	0.35	0.0	0.0	0.11	1.41

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
0	350	5		0.20	0.60	0.0	1.00	0.40	0.80
0	355	5		0.20	0.60	0.40	0.0	1.00	0.60
0	1045	1		0.20	0.60	0.0	0.80	0.40	1.00
0	1180	2		0.40	0.0	0.60	0.80	0.20	1.00
0	1185	7		0.80	0.60	1.00	0.20	0.40	0.0
0	1200	8		0.80	0.40	0.20	0.0	1.00	0.60
0	1275	5		0.80	0.40	1.00	0.60	0.20	0.0
0	1285	8		0.40	1.00	0.40	0.20	0.60	0.0
2	75	5		1.00	0.20	0.40	0.80	0.60	0.0
2	165	4		0.80	0.0	0.60	0.40	0.20	1.00
2	178	5		0.40	0.20	0.0	1.00	0.60	0.80
2	250	7		0.80	0.20	0.0	1.00	0.60	0.40
2	285	3		1.00	0.40	0.60	0.20	0.0	0.80
2	345	3		0.60	0.40	1.00	0.20	0.80	0.0
2	370	4		0.40	0.60	0.0	0.60	0.20	1.00
2	410	6		0.0	0.80	0.60	0.20	0.40	1.00
2	435	1		1.00	0.40	0.20	0.60	0.0	0.80
2	530	11		0.0	0.60	1.00	0.40	0.80	0.20
2	605	7		0.80	0.20	0.0	0.40	0.60	1.00
2	645	10		0.40	0.0	0.80	0.60	0.20	1.00
2	790	10		0.0	0.40	0.60	0.20	0.80	1.00
2	850	7		0.0	0.40	0.60	1.00	0.80	0.20
2	970	3		0.0	0.60	1.00	0.40	0.80	0.20
2	1130	8		0.40	0.60	1.00	0.20	0.80	0.0
2	1170	12		1.00	0.40	0.60	0.0	0.20	0.80
2	1250	3		1.00	0.80	0.60	0.20	0.0	0.40
2	1360	6		0.60	0.80	0.0	1.00	0.40	0.20
2	1380	7		0.20	0.80	0.0	0.60	0.40	1.00
2	1500	17		0.0	0.40	0.80	0.20	0.60	1.00
2	1560	6		0.0	0.80	1.00	0.40	0.60	0.20
2	1603	5		0.60	0.80	1.00	0.0	0.40	0.20
2	1655	6		0.80	0.0	1.00	0.20	0.60	0.40
2	1680	3		0.40	0.20	0.80	0.0	1.00	0.60
2	1960	3		0.80	0.40	0.0	1.00	0.20	0.60
2	1600	9		0.60	0.0	0.40	1.00	0.80	0.20
2	1640	1		0.80	1.00	0.0	0.20	0.60	0.40
2	1660	2		0.0	1.00	0.60	0.80	0.40	0.20
2	1695	2		0.40	0.60	0.0	1.00	0.20	0.80
2	1775	5		0.0	0.40	0.60	0.80	0.20	1.00
2	1811	7		0.60	0.20	0.80	0.0	0.40	1.00
2	1901	6		0.0	0.60	0.40	0.20	0.80	1.00
2	1930	4		1.00	0.60	0.0	0.40	0.20	0.80
2	1970	6		1.00	0.20	0.0	0.80	0.60	0.40
2	2025	6		1.00	0.40	0.20	0.60	0.80	0.0
2	2056	6		0.0	0.40	0.80	1.00	0.60	0.20
2	2130	2		1.00	0.80	0.0	0.60	0.20	0.40
2	2166	5		1.00	0.80	0.60	0.0	0.20	0.40
2	2205	4		0.0	0.40	1.00	0.60	0.80	0.20
2	2240	2		0.0	0.80	0.20	1.00	0.40	0.60
2	2291	6		1.00	0.60	0.20	0.0	0.40	0.80
2	2405	4		0.40	0.20	0.80	1.00	0.60	0.0
3	25	5		0.60	0.40	0.80	0.20	0.0	1.00
3	30	4		1.00	0.60	0.80	0.20	0.0	0.40
3	140	2		0.40	0.60	0.80	1.00	0.0	0.20
3	240	4		0.0	0.60	0.40	0.80	1.00	0.20

*** LISTING OF PERCENTIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	I0	I1	I2	I3	I4	I5
3	475	5		1.00	0.80	0.0	0.20	0.40	0.60
3	480	5		1.00	0.80	0.0	0.20	0.40	0.60
3	560	5		0.80	0.20	0.40	0.60	0.0	1.00
3	525	7		0.0	0.20	1.00	0.40	0.60	0.80
3	565	1		0.40	1.00	0.80	0.60	0.20	0.0
3	900	6		1.00	0.80	0.20	0.0	0.60	0.40
3	965	9		0.40	0.60	1.00	0.20	0.0	0.80
3	1030	6		0.20	0.0	0.60	1.00	0.80	0.40
3	1070	5		0.20	0.60	0.40	0.0	1.00	0.80
3	1085	1		0.80	0.60	0.40	0.20	0.0	1.00
3	1210	3		0.0	0.80	0.20	0.40	1.00	0.60
3	1235	5		0.20	0.60	0.80	1.00	0.40	0.0
3	1240	10		1.00	0.60	0.20	0.0	0.40	0.80
3	1245	8		0.60	1.00	0.20	0.0	0.40	0.80
3	1255	7		0.0	0.20	1.00	0.60	0.80	0.40
3	1345	1		0.40	0.60	0.20	0.0	1.00	0.80
3	1350	2		0.0	0.20	1.00	0.40	0.80	0.60
3	1445	3		0.40	0.60	0.20	0.80	1.00	0.0
3	1565	4		0.40	0.20	0.80	0.60	1.00	0.0
3	1770	5		0.40	0.0	1.00	0.20	0.80	0.60
3	1855	7		1.00	0.40	0.0	0.60	0.20	0.80
3	1960	1		0.20	0.40	0.0	1.00	0.80	0.60
3	2015	2		0.0	0.20	0.60	1.00	0.80	0.40
3	2085	6		0.60	0.80	0.0	1.00	0.20	0.40
3	2100	2		0.80	0.60	0.40	0.20	0.0	1.00
3	2330	5		0.40	0.60	1.00	0.80	0.0	0.20
3	2340	1		0.60	0.20	0.80	1.00	0.40	0.0
3	2345	5		1.00	0.60	0.20	0.0	0.80	0.40
4	10	5		0.20	0.0	1.00	0.40	0.60	0.80
4	20	1		0.60	1.00	0.40	0.0	0.20	0.80
4	275	4		0.80	1.00	0.20	0.60	0.0	0.40
4	470	5		0.60	0.0	0.80	0.20	1.00	0.40
4	495	2		0.20	0.40	0.80	0.0	0.60	1.00
4	520	6		0.60	0.80	0.0	0.40	1.00	0.20
4	855	4		1.00	0.40	0.20	0.80	0.60	0.0
4	1025	9		1.00	0.40	0.0	0.20	0.80	0.60
4	1275	2		0.40	0.80	0.20	1.00	0.0	0.60
4	1320	3		0.20	0.0	1.00	0.60	0.40	0.80
99	1554	1		0.60	0.20	1.00	0.40	0.0	0.80
99	2910	1		0.0	1.00	0.20	0.60	0.80	0.40
99	99999	2		1.00	0.20	0.80	0.40	0.0	0.60

*** LISTING OF NORM EXTREMES BY GROUP
RANK ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 0 GROUP NO. 350 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 0 GROUP NO. 355 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
14	1.000

*** STRATA NO. 0 GROUP NO. 1045 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
15	1.000

*** STRATA NO. 0 GROUP NO. 1140 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.000
15	1.000

*** STRATA NO. 0 GROUP NO. 1185 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
12	1.000

*** STRATA NO. 0 GROUP NO. 1200 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
14	1.000

*** STRATA NO. 0 GROUP NO. 1275 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1285 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
11	1.000

*** STRATA NO. 2 GROUP NO. 75 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 155 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

10	C.PCC
15	1.CCC

*** STRATA NO. 2 GRCUP NC. 178 SAMPLE SIZE = 5

*** LCW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	C.800
13	1.000

*** STRATA NC. 2 GRCUP NC. 250 SAMPLE SIZE = 7

*** LCW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.C
11	C.2CO

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.800
13	1.0CO

*** STRATA NO. 2 GRCUP NC. 295 SAMPLE SIZE = 3

*** LCW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.C
13	C.2CO

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.CCO

*** STRATA NO. 2   GROUP NO. 345   SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2   GROUP NO. 370   SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 2   GROUP NO. 410   SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 2   GROUP NO. 435   SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 530 SAMPLE SIZE = 11

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 605 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 665 SAMPLE SIZE = 19

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

12	C.900
15	1.000

*** STRATA NO. 2 GROUP NO. 79C SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	C.2CO

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	C.8CO
15	1.000

*** STRATA NO. 2 GROUP NO. F5C SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	C.2CO

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	C.8CO
13	1.000

*** STRATA NO. 2 GROUP NO. S7C SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	C.0
15	0.2CO

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	C.8CC
12	1.000

*** STRATA NO. 2 GROUP NO. 1100 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1170 SAMPLE SIZE = 12

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 1250 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 1260 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1280 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1290 SAMPLE SIZE = 17

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1350 SAMPLE SIZE = 0

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

11	C.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1403 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	C.0
15	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	C.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1455 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.C
13	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.800
12	1.000

*** STRATA NO. 2 GROUP NO. 1500 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	C.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	C.800
14	1.000

*** STRATA NO. 2 GROUP NO. 156C SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	C.C
14	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 160C SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	C.C
15	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	C.800
13	1.000

*** STRATA NO. 2 GROUP NO. 164C SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	C.C
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	C.800
11	1.000

*** STRATA NO. 2 GROUP NO. 166C SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
11	1.000

*** STRATA NO. 2 GROUP NO. 1655 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 1775 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1811 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

12	0.900
15	1.000

*** STRATA NO. 2 GROUP NO. 1661 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
15	1.000

*** STRATA NO. 2 GROUP NO. 1900 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 1970 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2025 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2096 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 2130 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2166 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

13	0.0
14	0.800

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 2205 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 2 GROUP NO. 2240 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 2 GROUP NO. 2291 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

15	C.000
10	1.000

*** STRATA NO. 2 GROUP NO. 2405 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.250

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.000
13	1.000

*** STRATA NO. 3 GROUP NO. 25 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.600
15	1.000

*** STRATA NO. 3 GROUP NO. 30 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
10	1.000

*** STRATA NO. 3 GROUP NO. 140 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 240 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 475 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 3 GROUP NO. 430 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 3 GROUP NO. 500 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. 3 GROUP NO. 525 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.200
12	1.000

*** STRATA NO. 3 GROUP NO. 595 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

12	0.250
11	1.000

*** STRATA NO. 2 GROUP NO. 950 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
10	1.000

*** STRATA NO. 2 GROUP NO. 965 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1030 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 1090 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 1095 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. 3 GROUP NO. 1210 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 1295 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

15	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 1240 SAMPLE SIZE = 10

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 3 GROUP NO. 1245 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
11	1.000

*** STRATA NO. 3 GROUP NO. 1335 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

14	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1345 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 1350 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1445 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 1??? SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.?00

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
14	1.000

*** STRATA NO. 3 GROUP NO. 177C SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 1?5? SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.?00

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 3 GROUP NO. 19?C SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2015 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2025 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2150 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

10	0.800
15	1.000

*** STRATA NO. 3 GROUP NO. 2330 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
12	1.000

*** STRATA NO. 3 GROUP NO. 2340 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
13	1.000

*** STRATA NO. 3 GROUP NO. 2345 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
10	1.000

*** STRATA NO. 4 GROUP NO. 1C SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 4 GROUP NO. 2C SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
11	1.000

*** STRATA NO. 4 GROUP NO. 33S SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
11	1.000

*** STRATA NO. 4 GROUP NO. 47C SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

11	C.C
13	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	C.800
14	1.CCO

*** STRATA NO. 4 GROUP NO. 495 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	C.C
1)	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	C.800
15	1.000

*** STRATA NO. 4 GROUP NO. 520 SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
15	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	C.800
14	1.000

*** STRATA NO. 4 GROUP NO. 555 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
12	C.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

13	0.800
10	1.000

*** STRATA NO. 4 GROUP NO. 1025 SAMPLE SIZE = 9

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
10	1.000

*** STRATA NO. 4 GROUP NO. 1225 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
11	0.800
13	1.000

*** STRATA NO. 4 GROUP NO. 1230 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 99 GROUP NO. 1954 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 99 GROUP NO. 2910 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
11	1.000

*** STRATA NO. 99 GROUP NO.999999 SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
14	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
10	1.000

*****STEP COST = 1 4.54

INSTITUTE FOR SOCIAL RESEARCH MONITOR SYSTEM 02/01/74

*****LISTING OF SETUP FOLLOWS:

```
CASE                1         2         3         4         5         6         7         8
NO.    1234567890123456789012345678901234567890123456789012345678901234567890123456789012345678
   1   &RUN NORM
   2   TEST RUN
   3   CVAR=3 SVAR=4 PREC STAN NORM INFI=IN1*
   4   V10-V15*
   5   &READFILE
```

PROGRAM NORM OCTOBER 1974

GVAR=3 SVAR=6 PREC STAN NORM INFI=IN1*

THE VARIABLE LIST IS:

V10-V15*

	VAR.	TYPE	VARIABLE NAME	FLOC	WIDTH	N DEC	RESP.	MCODE1	MCODE2	RGRNO	ID	TSEQNO
T	3	0	WORK GROUP NO.	10	5	0	1	0059999				00000
T	5	0	2-DIGIT CLASS	28	2	0	1	0000099				00000
T	10	0	10 CO HAS CLEAR GOALS	33	1	0	1	0000009	0000006			00000
T	11	0	11 WK ACTIVITY ORGANIZED	34	1	0	1	0000009	0000006			00000
T	12	0	12 YOU GET OTH UNIT INFO	35	1	0	1	0000009	0000006			00000
T	13	0	13 SUPS OPEN TO IDEAS	36	1	0	1	0000009	0000006			00000
T	14	0	14 TOLD ENOUGH TO DO JOB	37	1	0	1	0000009	0000006			00000
T	15	0	15 YOU FEEL LOYAL TO CO	38	1	0	1	0000009	0000006			00000

*** PARAMETER SPECIFICATION

STRATA VARIABLE IS : 2-DIGIT CLASS VARIABLE NO. 6
GROUP VARIABLE IS : WORK GROUP NO. VARIABLE NO. 3
MINIMUM PERCENTILE IS THE.40TH

MAXIMUM PERCENTILE IS THE 60TH
PREDICTED CRITERION SCORE MODE
WORK DATA SET
BAD DATA WILL TERMINATE RUN
EITHER MISSING DATA CODE VALUE FOR ANY VARIABLE WILL DELETE THE CASE

*** AFTER GLOBAL FILTERING
SAMPLE SIZE = 125
NO.OF STRATA = 5
NO.OF GROUPS = 17

*** NO. OF CASES ELIMINATED BECAUSE OF MD1 = 0

*** NO. OF CASES ELIMINATED BECAUSE OF MD2 = 0

*** FINAL NO. OF CASES FOR ANALYSIS = 125

*** AGGREGATED DATA ***

STRATA	GROUP	SIZE	10	11	12	13	14	15
1	33110	14	3.21	2.71	2.50	2.57	2.79	3.57
1	33120	18	2.83	2.00	1.89	1.94	2.50	3.11
1	33130	14	2.57	2.07	2.00	2.14	2.43	3.50
1	33140	4	3.50	3.00	3.00	3.75	4.00	4.00
1	33150	7	2.86	2.43	2.00	2.29	2.71	4.71
1	33210	8	3.50	2.25	2.62	2.25	2.50	3.25
1	33220	13	3.46	2.77	1.54	2.38	2.62	3.69
1	33230	15	3.13	2.33	2.00	2.53	3.00	3.60
2	32100	3	3.67	3.67	3.00	3.67	4.33	4.33
2	33100	4	3.25	2.75	2.00	3.25	2.50	3.00
2	33200	5	3.00	2.40	2.20	2.40	2.80	3.80
2	33300	1	4.00	3.00	3.00	4.00	5.00	5.00
3	21000	5	3.20	2.40	2.80	3.00	2.40	4.40
3	22000	8	4.00	3.62	3.12	4.00	3.87	4.25
3	23000	2	2.50	3.00	3.00	4.00	3.50	4.50
4	10110	3	3.67	4.33	3.33	4.00	4.00	4.33
99	99999	1	5.00	4.00	3.00	2.00	5.00	2.00

*** LISTING OF STANDARDIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
1	33110	14		0.24	0.31	0.69	0.17	-0.07	-0.23
1	33120	18		-0.91	-1.35	-0.69	-1.04	-0.66	-1.22
1	33130	14		-1.71	-1.13	-0.44	-0.66	-0.81	-0.39
1	33140	4		1.11	1.68	1.82	2.46	2.47	0.69
1	33150	7		-0.84	-0.05	-0.44	-0.34	-0.22	2.22
1	33210	8		1.11	-0.59	0.97	-0.46	-0.66	-0.92
1	34220	13		1.00	0.98	-1.48	-0.19	-0.42	0.03
1	33230	15		-0.00	-0.34	-0.44	0.10	0.38	-0.17
2	32100	3		0.49	1.67	0.99	0.56	0.65	0.41
2	33100	4		-0.60	-0.85	-1.21	-0.13	-1.11	-1.41
2	33200	5		-1.25	-0.63	-0.77	-1.55	-0.82	-0.32
2	33300	1		1.36	-0.15	0.99	1.12	1.29	1.32
3	21000	5		-0.05	-1.22	-1.31	-1.41	-1.37	0.16
3	22000	8		1.25	1.23	1.12	0.71	0.59	-1.30
3	23000	2		-1.20	-0.02	0.19	0.71	0.39	1.14
4	10010	3		0.0	0.0	0.0	0.0	0.0	0.0
99	99999	1		0.0	0.0	0.0	0.0	0.0	0.0

*** LISTING OF PRED. CRIT. SCORES

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
1	33110	14		0.06	0.29	0.01	0.11	-0.03	-0.17
1	33120	18		-0.24	-0.48	-0.01	-0.68	-0.26	-0.88
1	33130	14		-0.45	-0.40	-0.01	-0.43	-0.31	-0.28
1	33140	4		0.29	0.59	0.03	1.61	0.95	0.49
1	33150	7		-0.22	-0.02	-0.01	-0.25	-0.06	1.59
1	33210	8		0.29	-0.21	0.01	-0.30	-0.26	-0.66
1	33220	13		0.26	0.34	-0.02	-0.12	-0.16	0.02
1	33230	15		-0.00	-0.12	-0.01	0.06	0.15	-0.12
2	32100	3		0.30	0.93	0.34	0.35	0.30	0.23
2	33100	4		-0.37	-0.46	-0.41	-0.08	-0.52	-0.81
2	33200	5		-0.78	-0.39	-0.26	-0.95	-0.38	-0.18
2	33300	1		0.84	-0.09	0.34	0.69	0.60	0.76
3	21000	5		-0.01	-0.42	-0.64	-0.95	-0.82	0.04
3	22000	8		0.29	0.43	0.55	0.48	0.59	-0.32
3	23000	2		-0.28	-0.01	0.09	0.48	0.23	0.28
4	10010	3		0.0	0.0	0.0	0.0	0.0	0.0
99	99999	1		0.0	0.0	0.0	0.0	0.0	0.0

*** LISTING OF PERCENTILIZED MATRIX

STRATA	GROUP	FREQUENCY	VARIABLE NOS.	10	11	12	13	14	15
1	33110	14		0.60	1.00	0.40	0.80	0.20	0.0
1	33120	18		0.80	0.40	1.00	0.20	0.60	0.0
1	33130	14		0.0	0.40	1.00	0.20	0.60	0.80
1	33140	4		0.20	0.60	0.0	1.00	0.80	0.40
1	33150	7		0.20	0.60	0.80	0.0	0.40	1.00
1	33210	8		1.00	0.60	0.80	0.20	0.40	0.0
1	33220	13		0.80	1.00	0.40	0.20	0.0	0.60
1	33230	15		0.60	0.20	0.40	0.80	1.00	0.0
2	32100	3		0.40	1.00	0.60	0.80	0.20	0.0
2	33100	4		0.80	0.40	0.60	1.00	0.20	0.0
2	33200	5		0.20	0.40	0.80	0.0	0.60	1.00
2	33300	1		1.00	0.0	0.20	0.60	0.40	0.80
3	31000	5		0.80	0.60	0.40	0.0	0.20	1.00
3	32000	9		0.20	0.40	0.80	0.60	1.00	0.0
3	33000	2		0.0	0.20	0.40	1.00	0.60	0.80
4	10010	3		0.0	0.20	0.40	0.60	0.80	1.00
99	99999	1		0.0	0.20	0.40	0.60	0.80	1.00

*** LISTING OF NORM EXTREMES BY GROUP
RANK ORDERING BY PERCENTILE MAGNITUDE

*** STRATA NO. 1 GROUP NO.33110 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
11	1.000

*** STRATA NO. 1 GROUP NO.33120 SAMPLE SIZE = 16

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
12	1.000

*** STRATA NO. 1 GROUP NO.33130 SAMPLE SIZE = 14

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
12	1.000

*** STRATA NO. 1 GROUP NO.33140 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
12	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
13	1.000

*** STRATA NO. 1 GROUP NO.33150 SAMPLE SIZE = 7

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
15	1.000

*** STRATA NO. 1 GROUP NO.33210 SAMPLE SIZE = 8

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
10	1.000

*** STRATA NO. 1 GROUP NO.33220 SAMPLE SIZE = 13

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

14	0.0
13	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
11	1.000

*** STRATA NO. 1 GROUP NO.33230 SAMPLE SIZE = 15

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
14	1.000

*** STRATA NO. 2 GROUP NO.33130 SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
13	0.800
11	1.000

*** STRATA NO. 2 GROUP NO.33100 SAMPLE SIZE = 4

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE

10	0.800
13	1.000

*** STRATA NO. 2 GROUP NO.33200 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
10	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	0.800
15	1.000

*** STRATA NO. 2 GROUP NO.33300 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
11	0.0
12	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	0.800
10	1.000

*** STRATA NO. 3 GROUP NO.21000 SAMPLE SIZE = 5

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
13	0.0
14	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
10	0.800
15	1.000

*** STRATA NO. 3 GROUP NO.23CCC SAMPLE SIZE = 6

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
15	C.C
10	C.2CC

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
12	C.8CC
14	1.CCC

*** STRATA NO. 3 GROUP NO.23CCC SAMPLE SIZE = 2

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	C.C
11	C.2CC

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
15	C.8CC
13	1.CCC

*** STRATA NO. 4 GROUP NO.1CC1C SAMPLE SIZE = 3

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE
10	C.C
11	C.2CC

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	C.8CC
15	1.CCC

*** STRATA NO. 99 GROUP NO.99999 SAMPLE SIZE = 1

*** LOW SCORES

VARIABLE NUMBER	PERCENTILE

10	0.0
11	0.200

*** HIGH SCORES

VARIABLE NUMBER	PERCENTILE
14	0.800
15	1.000

*****STOP COST = $ 1.23

******NO MORE RUN CARDS; TOTAL COST = $ 5.78