DESIGN AND DEVELOPMENT OF DECAID:
A CAL DECISION FORMULATION PROGRAM

by

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A thesis submitted in partial fulfillment of the
requirements for the degree of Master of Arts
in Business Administration in the
Graduate College of
The University of Iowa

December, 1977

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ACKNOWLEDGEMENTS

Completion of this thesis has involved much time and effort, but the goodwill and enthusiastic encouragement of the members of my thesis committee has been instrumental in its completion.

Professor Warren Boe, my academic advisor, encouraged me and tolerated my inaction in completing this document. Professor Bobby Brown was a source of invaluable information about Computer Aided Instruction and Instructional Design. Professor Gerald Rose, my thesis supervisor, provided me a forum and testing ground for ideas; he also encouraged me to report my efforts to develop DECAID. All three have given freely of their time and I want finally to thank them for their constructive comments and suggestions.

Numerous other people have helped me produce this thesis. It would not have been completed but for their assistance. I want to sincerely thank the following people for their time and effort: Arthur Darrow, Richard Harrell, Margaret Helble, Robert Klaus, Sue Schmidt, and Barbara Sender. And I want to especially thank Kathy Bryant and Linda Knowling.

Finally, I want to acknowledge the help and encouragement of my parents, Maxine and La Vern, and my brother, Mark.

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CHAPTER I

INTRODUCTION TO DECAID

Most managers must make decisions under conditions of rapid change, complexity and conflict. Although most managers want to make effective decisions, this goal is often thwarted by decision making behavior which is predisposed to concentrate on converging on the "right" decision. No one can deny that making the "right" decision is important, but decision makers must link this goal to a rigorous decision making process if they want to make effective strategic decisions, i.e. ill-defined and unstructured decisions. If managers of organizations in turbulent environments (Lawrence and Lorsch, 1967) want to improve strategic decision making, they must emphasize the divergent parts of the decision making process. They should develop an awareness of the intricacies of the decision making process; and they should attempt to structure explicitly their decision behavior to insure that all appropriate decision criteria are applied in strategic decision situations. Specifically, managers must be aware of two problems that occur in strategic decision situations, i.e. the error of the third type and premature closure. Managers must also learn a strategy for avoiding or minimizing the occurance of these errors in their decision making processes.

In an attempt to help managers meet these goals, a computer aided learning (CAL) program, DECAID, was

designed and developed for use in management education. DECAID, a mnemonic for "DECision AID", is used as part of an experiential strategic decision making exercise. It is an organized collection of heuristic models, i.e. procedures for seeking solutions (MacCrimmon and Taylor, 1976), which have been programmed and interrelated using the Instructional Dialogue Facility (Hewlett Packard, 1975) and the Basic programming language (Hewlett Packard, 1975). DECAID is an interactive, conversational structure of decision related questions and instructional materials.

Definitions

Many of the concepts in the preceeding discussion are camouflaged in jargon. The categorizations are convenient for expository reasons and they will reoccur in the material which follows. Therefore, this opportunity to define fundamental notions can promote understanding of later discussions.

Effective decision making is a well-worn concept, but specifically it refers to decisions which result in the attainment of the organizational goals relevant to the original decision question.

A decision question is a difficult concept to define. Intuitively it is a statement of the central issue which must be resolved by the decision process. A decision question is a function of the decision maker's conceptualization of his decision situation. The characteristics of a decision question are not clearly specified in the literature. But, the following characteristics are a first attempt at enumerating this concept. A decision question specifies a question word, i.e. Who, When or How, an action word, i.e. increase, motivate or maximize, the decision maker(s), the problem or opportunity in the decision situation and relevant causal relationships. Decision questions are, however, rarely specified by decision makers and this can create ambiguity in the decision process. It also makes it difficult to avoid an error of the third type.

A strategic decision or higher order decision task (Rose, 1974) may be described (with some redundancy) as: 1) nonroutine and unprogrammed (Simon, 1960); 2) ill-structured and unfolding (Reitman, 1964); 3) vital (in terms of payoffs to the decision maker and his organization); 4) only partially controllable by the decision maker; 5) involving multiple technologies (disciples); 6) lacking a clear objective function; 7) unconfirmable (feedback on decision adequacy is often

impossible; or delayed, partial, and unreliable); and 8) embedded in a hierarchy of related decisions.

Mitroff and Featheringham (1974) define the error of the third type as "the error or probability, of having solved the wrong problem, choosing the wrong problem representation, when one should have solved the right problem, chosen the right representation". Because managers often fail to define explicitly their decision questions it is difficult to identify errors of the third type. But, Basil (1970) provides an example which illustrates the third type error. He relates an encounter between the president of a small company and an outside consultant. After some prodding the president defined his decision situation as "the company should obtain a higher percentage of profit on net sales than it was then enjoying". He subsequently made the causal attribution that "the production workers were not performing the way they should". The consultant proceeded to make a thorough investigation of the problem and he concluded that a number of seperate circumstances were responsible for the decline in profits: "advertising expenditures had risen rapidly, the price of raw materials had increased without any increase in the price of the finished products, executives' salaries had been increased, and the markup permitted to retailers of the

company's products had been increased several times without any upward adjustment in the retail price". But, the cause of the problem could not be attributed to the production workers. Although the president of the company did not formulate a decision question and make a decision in the context of his original perceptions, it is likely that some managers in analogous situations would have committed an error of the third type. This example demonstrates that an error of the third type can result from inappropriate causal attribution. A third type error can also result from logical inconsistency, failure to reevaluate a decision question when additional information is received and from the limitations of the "world view" of the decision maker (Churchman, 1970).

Premature closure occurs when a decision maker delimits his evaluation and search for relevant decision questions, organizational goals or alternative actions before his decision set includes an appropriate, accurate, satisfactory or "best" element. Examples of premature closure are also often difficult to diagnose because few decision makers explicitly consider and document their alternative decision questions, goals or actions. The problem of premature closure is complicated by the problem of determining the marginal cost and marginal benefit which accrues from additional search and

postponing closure. But, people must at a minimum consider the possibility that premature closure is occuring at various stages in the decision process.

Heuristic models are abstract representations of an actual process or activity. The heuristics in DECAID are based on a set of questions relevant to the decision making process which are related to each other logically and which help a decision maker expand his decision making process investigation in directions it might not have otherwise taken. Each model is based on criteria relevant to an aspect of the decision process.

A computer aided learning (CAL) program presents instructional materials as part of a process or activity. The frames, i.e. text, question, expected responses and feedback, are not constructed-response or multiple choice types, rather the frames request input which the program logic uses to control branching in the process and to control instructional material and process oriented feedback.

Finally, an experiential decision making exercise attempts to actively involve the user in a minimally specified situation. The student assigned the exercise is encouraged to assume a specific role.

Objectives of the DECAID Project

The major objective of the DECAID Project was to design and develop a computer aided learning (CAL) program which would aid people in strategic decision situations. Specifically, the program was designed to help people: 1) recognize the importance of avoiding the third type error (Mitroff and Betz, 1972); and 2) avoid premature closure. Part of the development process included creating associated instructional materials for use with the DECAID program, i.e. a management decision incident, a DECAID Student Manual, a DECAID exercise instruction sheet, and satisfaction and performance measures.

Secondary objectives included verification of the premise that questions could be used as the major component for heuristic models, specification of a detailed higher order decision process model and evaluation of the possiblility of using DECAID in management education.

Applications of DECAID

The current version of DECAID and future versions may have an impact on the teaching of strategic decision making. Some categories of strategic decision questions

which might be used with the DECAID program include: determination of company policy, resource investments, strategy considerations in marketing, high risk investment decisions, personnel questions related to key officers and matters of capital financing.

Specific decision questions which may be appropriate for use with DECAID include the following questions cited by Lawrence and Lorsh (1967): "What type of organization will we use to coordinate our sales effort? How much control and direction should we give our research scientists? Can improvements in our organization help us develop more new products? What can we do to achieve better coordination between sales and plant personel on delivery schedules? Will changes in our financial reward or control systems improve the effectiveness of our managers?

In general, the following criteria (c.f. Horton, 1972) should guide the selection of situations where DECAID might be useful: 1) if the costs, benefits, consequences of penalties associated with the outcome of the decision are significantly large according to organization standards; or 2) if management is dissatisfied with the quality of strategic decision making and it is determined that the people in the

organization should be trained in the "techniques" of problem solving and decision making.

CHAPTER II

CONCEPTUAL FOUNDATIONS OF DECAID

Three concepts serve as a foundation for the design and development of DECAID, i.e. the decision making process, the errors that occur in strategic decision processes and programmed instruction. The following discussion elaborates each of these concepts and it relates them to the design of DECAID. Understanding the conceptual foundations of DECAID may clarify the objectives of the program, the advantages of a computer aided learning methodology for meeting these objectives, and the potential uses of DECAID in management education.

Decision Making Process

The first concept which must be defined is the phrase "decision making process". Two major conceptualizations of the "decision making process" are currently discussed in the literature (Mintzberg, Raisinghani, and Theoret, 1976; Harrison, 1975; Murdick and Ross, 1975; Easton, 1973; and Richins, 1963). One point of view, the Kepner-Tregoe (Kepner and Tregoe, 1951) or exclusive position, considers the decision making process limited or restricted to the actual choice among alternative actions. Problem-solving becomes the major managerial activity in this conceptualization. Decision making is considered amenable to incorporation

in Management Information Systems, but problem-solving is an activity reserved for the manager alone (Murdick and Ross, 1975).

The competing view, the Simon (Simon, 1945; Simon, 1960) or inclusive position, includes problem-solving and activities such as generating and evaluating alternatives in the decision making process. One example is Simon's (1960) three phase model of the decision making process: 1) intelligence, 2) design, and 3) choice. Newell and Simon's (1972) research suggest that such inclusive models of decision making processes for strategic decision tasks may be subject to analysis and subsequent programming. The Simon or inclusive view of the decision making process is a foundation for the design of DECAID. In summary the DECAID decision making process is viewed as "a set of actions and dynamic factors that begins with the identification of a stimulus for action and ends with a specific commitment to action" (Mintzberg, Raisinghani, and Theoret, 1976).

Errors in the Decision Making Process

Managers are not infallible decision makers. Rose (1974) has discussed various limitations of people as components in man-machine systems. People will commit

errors in the decision making process, the question is can we train people to avoid the most important errors or minimize the probability that they will occur in strategic decision situations. The two errors which are frequently overlooked by decision makers in these decision situations, i.e. the error of the third type and premature closure were defined in chapter 1. The following discussion will elaborate the importance of these errors in strategic decision situations and it will investigate methodologies for reducing the frequency of these errors.

Errors of the Third Type

In a recent article Mitroff and Featheringham (1974) conclude: "... one of the most important errors associated with problem solving, (is) the error of the third kind." The importance of the third type error is further emphasized by Peter Drucker (Horton, 1972), who states that "there are few things as useless - if not dangerous - as the right answer to the wrong question." Despite these expressions of concern, the need to avoid or minimize the occurance of errors of the third type is not often discussed in practitioner or scholarly journals. Moreover, a review of the relevant literature

suggests that despite the efforts of some decision theorists, management scientists, organizational behavior specialists and management consultants little has been done to train managers to avoid this problem (c.f. Mitroff and Emhoff, 1977).

Accurate formulation of decision questions is, it may be judged, a necessary precondition for effective decision making. And as Mitroff and Betz (1972) claim the goal of minimizing the occurance of effors of the third type is of "fundamental importance in Management Science". This view is justified because regardless of the intensity or sophistication of the analysis used to select one alternative from many possible courses of action, if a decision situation is defined inappropriately, chance determines if the actions of the decision maker will meet the requirements of the actual decision situation.

Mitroff and Featheringham (1974) suggest a procedure by which a decision maker might ascertain whether he has appropriately formulated his problem. They use Ackoff's (1958) distinctions between informative, instructive and motivating messages to develop a criterion which can be used to compare the effectiveness of different methods of inquiry in problem definition. Ackoff's schema is basically teleological; and it allows a decision

theoretic treatment of problem solving. In the context of Ackoff's schema, informative messages cause changes in the receivers probability estimates; instructive messages cause changes in the receivers estimated effects of actions; and motivational messages cause changes in the relative values that a receiver places on the possible outcomes of his choice situation (Mitroff and Featheringham, 1974). But, the Mitroff and Featheringham (1974) approach is complex and not immediately appealing for managers or students and thus fails to motivate greater concern with avoiding errors of the third type.

Mitroff and Featheringham (1974) also discuss, in some detail, the concept of using a Dialectical Inquiring System (IS) as a mechanism for avoiding the error of the third type. They suggest that this error would be minimized if "for any problem, a Hegelian or Dialectical Inquiring System is designed to present the most intensive debate on the problem". Although a Hegelian Inquiring System might work, it would be necessary to modify or develop such a system for each specific decision situation. This process of developing an intensive debate on a problem would require considerable expertise and a sophisticated methodology, and it may therefore be prohibitively costly for all but the most important decisions. DECAID is an alternative mechanism

and instructional methodology for helping people avoid the third type error. It incorporates some characteristics of a Hegelian Inquiring System and a Twenty Questions process (Flesch, 1963) in an attempt to help users minimize the probability of committing the error of the third type. DECAID also presents informational material on what the error of the third type is and on how important it is that it be avoided. Finally, DECAID helps a user evaluate the rhetorical qualities of a decision question in an attempt to stress the importance of an appropriate decision question.

Premature Closure

Evidence (Simon and Newell, 1970) suggests that many people tend to commit errors of premature closure, i.e. prematurely restricting their set of possibilities. Premature closure may occur before a best alternative has been discovered, before the correct problem has been defined, and before alternative decision procedures have been evaluated. Because his problem may occur almost at the onset of deliberations it reinforces previous concern about the error of the third type. The nature of the problem further suggests that premature closure must be of concern throughout the decision making process.

Premature closure seems to occur because individuals tend to rely exclusively on their immediate data environment (information structure) in constructing a problem space (Newell and Simon, 1972). The problem space is the way a decision maker conceptualizes a task. This conceptualization of the problem space is important because it restricts the processes that can be used in problem solving or decision making. And it is reasonable that premature closure on a problem space can result in suboptimal or low quality decisions. Further difficulties associated with relying on the immediate data environment are discussed in the information processing literature (e.g. Schroder, Driver and Steufert, 1967). One concludes that unless the data environment is sufficiently rich (diverse) and/or ambiguous, decision makers may not be stimulated to complex or complete analyses. Also, the severity of this problem appears to increase when judgements are made in a social context. In such a setting, additional interpersonal factors reinforce a tendency toward premature closure (Janis, 1973).

DECAID helps a user structure the data environment and influences the conceptualization of the problem space. The questions in DECAID attempt: 1) to enable the decision maker to look beyond his immediate data

environment, i.e. enrich it or increase ambiguity; and 2) to encourage him to consider the influence of social context on his decision process.

Programmed Instruction and DECAID

Management education in the area of decision making behavior has relied on lecture, cases studies and games or simulations. Rarely do any of these methodologies confront the complexity of the decision making process or the importance of the divergent parts of the decision making process, i.e. question definition or alternative generation. Cases and simulations emphasize getting the "right" answer or maximizing or minimizing a quantifiable objective function. The emphasis on outcomes is tenable in decision situations where the problem is well structured and the process for making a decision is programmed and algorithmic. But, students don't necessarily develop the generalizations and behaviors necesary for strategic decision situations from these methods. Lectures have the potential for presenting these issues, but few instructors can find the time to research these issues and develop instructional materials. Also, instructors in most undergraduate management courses have limited opportunities to add an

extensive treatment of these issues to their already overburdened lecture schedule.

DECAID is an alternative methodology for covering issues associated with the decision making process. Instructors can determine when and how the program will be used in a course. It can be used outside of the classroom and it can be used with a variety of decision situations. In lectures the instructor can discuss the heuristic models in DECAID, the conceptual issues and/or the results of the DECAID assisted analysis. Also, instructors can modify the DECAID programs by adding models or text materials to tailor it to student interests or his personal orientation to the issues. Finally, DECAID can help an instructor overcome a problem many students have with topics in management and organizational behavior, i.e. insufficient experience and responsibilities in organizations which can be used as a base for applying concepts. The experiential nature of a DECAID exercise can help students recognize the complexity and importance of the decision making process. Also, experience with the decision process coupled with the instructional materials in DECAID can help students group and apply concepts learned in lectures and in textbooks and readings relevant to decision situations. As noted DECAID is an alternative methodology, it is a

computer aided learning (CAL) program; and it is appropriately categorized as a programmed instruction methodology.

Programmed instruction has often been narrowly defined by educators and laymen in terms of the Skinner-Holland, constructed-response program, and the Crowder, multiple-choice program, methodologies. DECAID does not fit in either of those niches, yet it is a programmed instructional methodology. It is appropriate at this point to document how DECAID conforms to some of the learning principals associated with programmed instruction. Seven principals (Fry, 1963) are often associated with programmed instruction: 1) frames or small conceptual units; 2) responses required; 3) immediate feedback; 4) frames are sequenced; 5) programs are goal-directed; 6) revisions in programs based on user responses; and 7) student controls rate of learning. DECAID utilizes all of these learning principals as a central framework for its design.

The DECAID decision making process is broken up into small units or frames. Each frame includes optional text materials, a question relevant to the decision process or program funtioning, answer groups, responses for expected and unexpected answers, a failure message and hints about

the intent of the question when they are needed. Chapter 4 discusses these characteristics in more detail.

In DECAID every frame requires some type of response from a DECAID user. The required responses may be a yes or no, a short answer or sentence, or various other types which are discussed in Chapter 4.

DECAID users receive immediate reinforcement. The reinforcement in DECAID may be short sentences and phases or it may be progression to another frame. When verbal reinforcement is provided it is contingent upon the users response, but the notion of "correctness" of response is not relevant in DECAID.

As noted in chapter 1, the questions in DECAID are arranged in sequences and they are grouped together as heuristic models. The relationships between frames is determined by an evaluation of the criteria contained in the heuristic models.

Almost by definition heuristic models are goal directed and one can conceptualize a hierarchy of goals for each model. The goals of the models are not explicitly stated at the present time and that is a weakness of the present version of DECAID.

Revisions in DECAID programs are based on user responses. But, because "correctness" of response is only a marginally relevant criteria, revisions are based

upon whether the response was anticipated by the program. Revisions in models may also result from problems users encounter.

Finally, a DECAID user is able to control his rate of learning. Few time constraints are imposed on the user by the program and it is possible for the user to return to the point at which he stopped using the program in some DECAID programs.

CHAPTER III

DEVELOPMENT OF DECAID

Design and development of DECAID has been a complex and difficult process. It began more than two years ago as a project for a Human Information Processing and Decision Making Behavior course. Initially, the objectives of the project were very limited. The extensive design and development activities which have since occured were not planned at that time. This discussion concerns the initial conceptualization of DECAID, ideas and problems which have effected the development of DECAID, decisions that were made regarding the content and structure of the program, the programming effort, and the evaluation process.

Course work in Marketing Management and Information Systems, also, influenced the decision to begin the DECAID project. First, the instructor in the Marketing Management course required students to write a number of management reports associated with various marketing cases. This task was difficult, because there were no detailed guidelines about what should be included in a management report. Various books on writing case reports, provided little guidance about how to "write-up" a management report. The case approach was also time consuming and very frustrating. In Information Systems, Davis' (1974) book was the principal text. One of his chapters deals with people's problems as decision

makers. This material was interesting and these ideas emphasized that decision makers place most of their emphasis on the "right" answer rather than on the decision making process. Also the substantive material in Davis (1974) supported a personal belief that computers had a vast potential to help people make decisions.

Against this background, the suggestion that students could work on an optional project as partial fulfillment of the requirements for the Human Information Processing and Decision Making course, was the stimulus which lead to the DECAID project. The course instructor, Gerald Rose, wanted to approve project topics and after an extensive exploratory discussion, he approved a project to program materials which might help people make nonprogrammable (Simon, 1960) decisions. At that meeting many of the ideas which have had the most influence on DECAID including Churchman's (1971) ideas about inquiring systems, Mitroff's (1974) ideas on errors of the third kind, and Janis's (1973) work on premature closure were discussed. Also, during that conference Rose discussed his efforts to develop computer assisted instruction materials in these topic areas.

During the Summer of 1975, Rose began developing instructional materials associated with the decision making process using the Instructional Dialogue Facility (IDF) on the Hewlett-Packard 2000/F Computer System. And in the fall of 1975 IDF appeared to be an ideal vehicle for developing the DECAID programs. The advantages of programming with IDAF (Hewlett Packard, 1975) include the following: 1) no programming knowledge is required; 2) BASIC programs can be incorporated in the author's course; 3) editing capabilities of several different kinds are provided so that lessons can be revised continually and improved by the author; 4) searches of two different types may be specified by the author for answer processing: for a specific word and for words in context (delimited); 5) alphabetic characters or numerical answers are acceptable student responses; 6) student performance statistics and responses can be saved for later analysis; 7) students leaving the computer terminal in the middle of a lesson can restart the lesson the next day at the point at which they left off; 8) students may request hints if the author has provided them.

That first discussion didn't resolve many issues, but it resulted in a commitment to explore ways in which the computer could help people improve their decision

making processes. Reading the Instructional Dialogue Facility Author's manual (Hewlett Packard, 1975) and the instructional materials which Rose had developed and attending lectures on instructional design presented by staff members from the Computer Assisted Instruction (CAI) Lab at the University of Iowa resulted in a conceptualization of how a computer could help people in decision making. The DECAID idea was that questions could be used to build models of the decision making processes. These questions could then be programmed using an interactive programming language to aid people in making decisions.

First Version of DECAID

After attending the workshop conducted by staff members from the CAI Lab, Harrison's (1975) and Simon's (1960) ideas influenced the initial design efforts. The first program was designed: 1) to help people categorize their decision situation, as programmable or non-programmable; and 2) to help people avoid the error of the third type. In that first version (see Appendix 13), the key word "search feature" of IDF was intriguing and an attempt was also made to develop a decision question evaluator, where the student would enter a

decision question and then based on a search through a large number of key words, he received recommendations about his decision question. But, the question evaluator was much more difficult to program than anticipated and this idea was has not been used in recent versions of DECAID. After considerable research and thought a flow-chart was drawn and the original DECAID was programmed. During that initial programming effort two problems were encountered. It was difficult to change the content of the model and its branching structure, because the editing features of IDAF were complex and time consuming when used. At that time the cause of the problem was attributed to a lack of planning, a failure to have more detailed flow-charts and a vague conceptualization of DECAID.

The first model contained four questions in a branching structure intended to help a person determine if their decision question was not programmable. It also contained key word search questions and it contained information material on a dichotomy in decision situations between problems and opportunities. A question asked users to make that distinction. This program demonstrated that it was possible to build an interactive model as a computer program. Also, that first program lead to the conclusion that the computer

could serve as a memory aid; it could store many models and it could help people to retrieve them, and apply them in decision situations.

Second Version of DECAID

Much thought and further research about the decision making process suggested that the DECAID model should encompass the entire decision making process and that it should also help people avoid errors of the third type and avoid premature closure. It was not certain that one could help people avoid errors of the third kind and premature closure. But some progress has occured in these areas, although the current IDF version of DECAID does not use all of the knowledge available about mitigating these problems, i.e. Ackoff's (1958) concepts of informative, instructive and motivating messages.

The new version of DECAID was designed largely from scratch; the original program was divided into three pieces. Also, a broader model of the decision making process (Harrison, 1975; Easton, 1973) served as the conceptual starting point. In this version the first model designed and programmed was a module intended to give students information about DECAID. It had an

entrance routine which contained questions which controlled branching to other programs and an exit routine which provided a structured end to DECAID. This original control system was not sophisticated, but it served immediate needs. The next section programmed was called QUEST, the question definition phase. This program emphasized the third type error. The initial design and programming efforts in QUEST concerned the logical and rhetorical characteristics of a decision question (Martin and Ohmann, 1964). It seemed plausible that if people were concerned about the structure of their decision question, beneficial effects in terms of avoiding the third type error would occur. This concern with the logic and rhetoric of the decision question was coupled with instructional materials about the third type error.

After developing QUEST, the first phase in the decision process, design and programming efforts centered on a goal definition model, GOALS, which had users state what goals were relevant to their decision situation. A model called ALTGEN was then developed which was intended to help people define and create alternative courses of action. A model called ALTEVA, the alternative evaluation phase was not completely programmed in this version CHOICE, a pro and con

comparison of alternatives and AUDIT, a decision audit were planned. By the end of January, 1976, most of the control system and QUEST had been programmed. Research and design activities proceded on the rest of the program, but it wasn't until early in June, 1976 that the program was functioning in it's entirety.

During the programming of QUEST it became obvious that IDF was not flexible enough to store a decision question in the memory of the computer. Programming with IDF became increasingly a frustrating experience. During the Spring Semester of 1976 course work in Management Systems and Topics in Management Information Systems began to influence the design of DECAID. During that period much attention was also directed toward instructional design and educational objectives for DECAID. After learning the BASIC programming language (Hewlett Packard, 1975) and after the author began a job in the computer lab in the College of Business (at the University of Iowa), programming of DECAID moved at a faster pace and BASIC components proliferated.

In the summer of 1976, much time and effort was expended on DECAID. Also, early that summer the first thesis committee meeting occurred. It was agreed that besides developing the DECAID program, it was necessary to evaluate it, determine if it helped people learn

about the decision making process, and determine if it had helped them avoid errors of the third type and premature closure. A committment was also made at that time to undertake three developmental testing projects and to engage in additional design and development work based on the results of those testing projects.

In June of 1976 instructional materials including a management case, a student manual, a performance measure and an attitude questionnaire were developed for the developmental testing project. Later that summer the first developmental testing cycle was conducted using student volunteers. Students came to the computer lab and the author attempted to help them with problems they encountered while using DECAID. Notes were made about problems students had with the program and they were encouraged to make suggestions about the programs. The method and results from this cycle is discussed in more detail in the Testing DECAID chapter.

Although it was not possible to collect hard copy protocols, some information was collected using the response files and the statistical files of IDF. At the end of July and in early August, the results of the developmental testing were reviewed for possible changes in DECAID. Some analysis of the attitude data was conducted. But, the response files maintained by IDF

did not collect as much information as anticipated because the files were not large enough to collect all student responses. The information which IDF did collect was analyzed. The response file data was somewhat useful, but the statistical data collected was not helpful for modifying DECAID. IDF maintained for each frame or section the number of attempts and the time required by each student to get the "correct" answer for the frame. Because the notion of a "correct" answer has no meaning in the context of DECAID and because most student required but one attempt to make a recognizable response, the mean latency (average amount of time taken by a student to make a correct response) and the percentage of eventual successes summary statistics provide little meaningful information.

Third Version of DECAID

During the last week of August, 1976, some of the problems discovered in DECAID were corrected, i.e. the branching structure, links to the exit routine, wording of questions, and its abruptness in branching and feedback. But, no major changes were made in the structure the program. Teaching an introductory management course, in the fall of 1976, created some doubts about

the adequacy of the structure and content of DECAID. But, time pressure forced the DECAID project to the "back burner". During that semester extensive reading about motivation, operant theory and learning theory were also affecting the conceptualization of DECAID.

At some point, it became obvious that DECAID was not as adequate conceptually as was perceived at the end of the summer. The prescriptive model included in DECAID was a plausible approach for making strategic decisions, but it did not contain alternative strategies for use in each phase, i.e. pro-con comparison,weighted choice model, and cost effectiveness choice model. Also, it contained some models which had minimal branching structure. And the DECAID programs did not utilize all of the material collected in BASIC program components to make conditional branches between questions and between models. Although changes were made in the program, it was again not possible to alter the basic DECAID structure. The control system was changed in an attempt to help users find the causes of a problem, also a question was included to identify the importance of a decision situation. The information evaluation materials were modified and a BASIC routine was added which displayed the decision question at various points in later phases of the decision process.

In late October, the exercise instruction sheet was modified and the second developmental testing cycle began. DECAID was an optional exercise, but in one course section management students wrote a management report based on the White Implement case (see Appendix 7). Use of DECAID was optional because teaching assistants could not require students to participate in experiments. Many students volunteered to use the program, but only 12 actually returned paper protocols with their management report, and completed the attitude questionnaire. No objective performance measure was used in the fall testing because the one used in the summer testing was not providing enough information about how well the educational objectives of the program were being met. No time was available to develop a new criteria based measure, therefore the management report served as a performance measure.

IDF statistics and response files were not maintained, rather students returned protocols which contained extensive information about their behavior while using DECAID. Use of DECAID was not monitored in the fall, rather students decided when they wanted to use it and they then went to the computer lab. This method, it was thought, would provide a better view of how well the program was working. Also it would help to

evaluate the robustness (Keen, 1975) of the input controls. After the testing was completed in 1976 the protocols were analyzed for problems and notes based on verbal feedback from student users was also analyzed. Frequent personal use of the programs also helped identify possible changes in the DECAID programs. The management reports did not indicate major differences between students who used the DECAID program and those that did not. But, using DECAID influenced the way some students structured their reports, i.e. they used DECAID headings and questions in their reports.

Fourth Version of DECAID

In early 1977, additional changes were planned; in general these changes made DECAID more complex. Bill Valiere became interested in the DECAID project in late February and he began to program a model developed by Vroom and Yetton (1973) for inclusion in DECIAD. That model was included in version four of DECAID. In addition changes were made in the control system and the alternative evaluation sections of DECAID. During this period behavioral objectives were developed for DECAID (see Appendix 9) and a performance measure (see Appendix 4) based on those behavioral objectives was developed.

Developmental testing that Spring used a quasi-experimental design (Campbell and Stanley, 1963), but again the type of design was limited because only volunteers could be used in the study. Therefore, subjects were not assigned randomly to the control and treatment group. For more information on the methodology and results of this developmental testing cycle see the chapter Testing DECAID.

At the end of the spring semester 1977 the attitude and performance data for the three developmental testing periods was analyzed. During the summer of 1977 the final draft of a paper on DECAID for the 9th Annual American Institute for Decision Sciences meeting (Power and Rose, 1977) was completed. Also, preparation of this thesis began during the summer. Some work began in the fall of 1977 to restructure DECAID based on the results of developmental testing; also, programming began for version five of DECAID. It is being programmed in BASIC (Hewlett Packard, 1975). No IDF components are being used in this version.

CHAPTER IV

PRESENT DESIGN OF DECAID

Two years ago, DECAID was little more than an idea and a challenge. Practicality is the criteria which has governed the design process because resource constraints, i.e. limited time, money and assorted resources, dictated that a comprehensive approach to systems design (Lucas,1976) was not possible. Although the DECAID project might have reached its current stage of development much sooner with abundant resources, the spontaneity, practicality and innovation that characterized its design might have been lost.

Conceptualization of DECAID

DECAID relies on a prescriptive abstraction of the decision making process, i.e. a specification of how a decision should be made, similar to one developed by Harrison (1975). But, the DECAID conceptualization contains three additional phases, i.e. question definition, information evaluation and decision audit (see Figure 1). The question definition phase is especially important to the decision making process because both errors discussed previously, the error of the third type and premature closure on a decision question, must be avoided or minimized in this phase. Premature closure can also occur in the context of evaluating information needs, therefore the quantity and

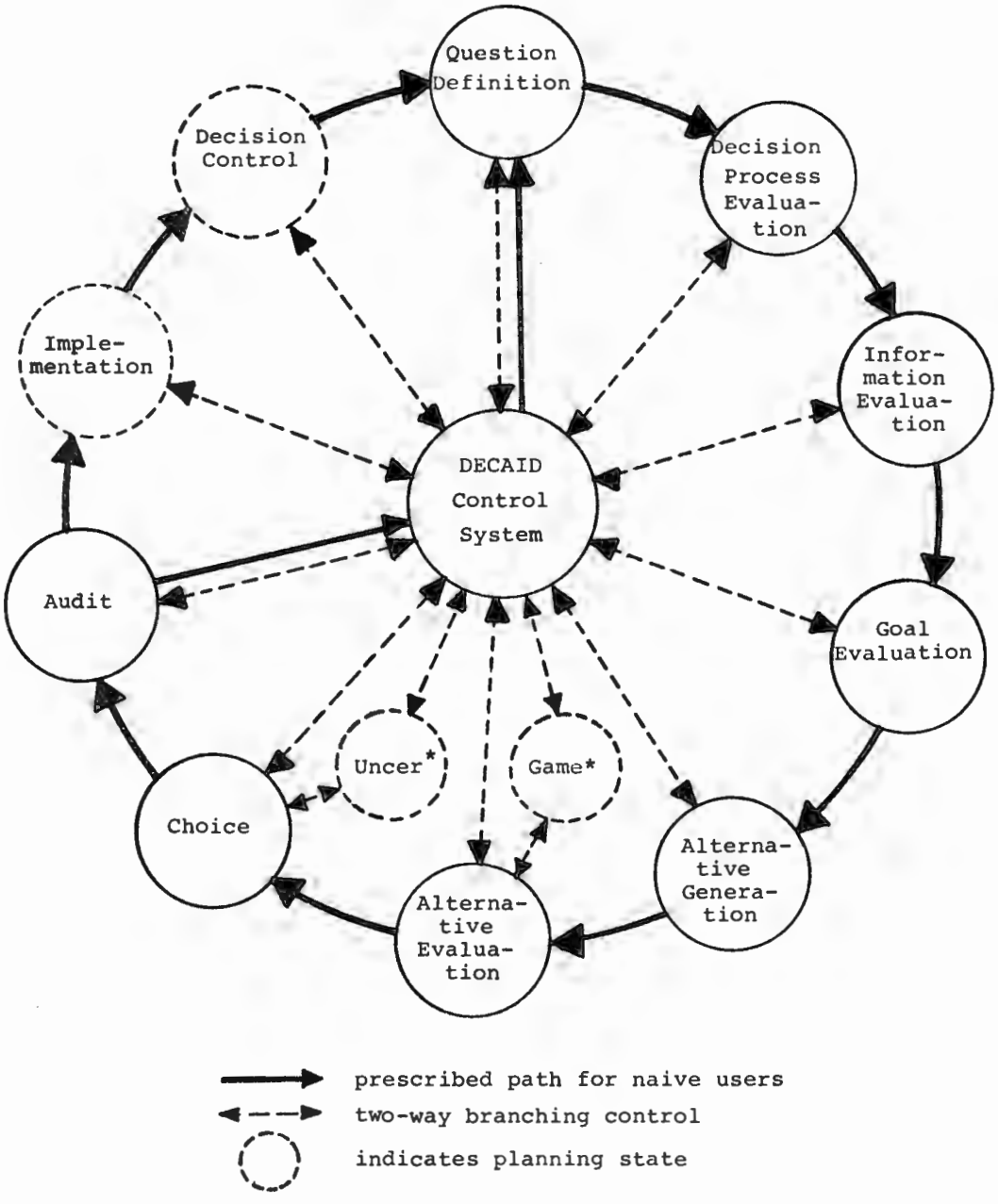


Figure 1. The conceptualization of the DECAID decision making process and instructional system.

quality of available information and the implications of that information should be evaluated explicitly in strategic decision situations. Finally, a reflective review or audit of the previously executed decision process prior to implementation of the decision may improve the quality of the decision and it may aid in implementation.

Program Characteristics

DECAID contains programmed heuristic models linked together in a prescriptive branching structure (see Figure 1 and Appendix 14). Although the word heuristic is used in several ways in the literature (Shull, Delbecq and Cummings, 1970), in the context of the DECAID programs heuristic means an ordered set of questions which stimulate investigation, i.e. it is a method which leads a person to investigate questions which might not have been considered.

Questions are the building blocks of the heuristic models in DECAID. The Instructional Dialogue Facility (Hewlett Packard, 1975) programs and the BASIC programs also contain text, answer groups, replies to answers, failure and unexpected answer messages and hints (see Table 1). But, questions are used to replicate a

Table 1

Summary of Instructional Dialogue Components used in DECAID

Element	Definition
Text	Noninterrogative information (instructional material) displayed to the user before a question is asked.
Question	A request for a response.
Correct-Answer Group	A collection of one or more answers the author considers correct (appropriate).
Wrong-Answer Group	A collection of one or more answers which the author regards as incorrect but which he suspects that a user may well try.
Reply to Correct (or Wrong) Answer Group	The message the author wishes to have displayed to any user whose answer falls in a correct or wrong answer group.
Reply to Unexpected Answer	The message the author wishes to have displayed to any user whose answer was not anticipated.
Failure Message	The message the author wishes to have displayed to a user who has exhausted his permitted trials.
Hint	A hint to be given to users who request it.

decision making process. As you may recall, the DECAID idea is that the organizational decision making process can be modeled as a structured set of questions which a decision maker should consider either explicitly or implicitly. The question asked of a person is very important and much consideration has been given to the question technique (Flesch, 1963). DECAID has two categories of questions, substantive and procedural. Substantive questions refer to the decision situation; procedural questions refer to the requirements of the DECAID program, i.e. requests to input alternatives, requests for branching instructions and requests about how the program is functioning.

DECAID contains questions which require various responses (see Table 2). In the present version the predominant question type is of the yes/no variety. Although it appears that more questions are required when this type is used rather than some of the other types, i.e. word or phase response, it makes programming and conditional branching easier. The open-ended question (word or phrase response) is also frequently used in DECAID, but conditional branching is difficult when this question type is used. Much of DECAID has a conditional branching structure, but some models use a predominantly unconditional branching structure. In the

Table 2

A Question and Response Matrix
(Intraprogram branching)

Response Types	Question Types		
	Q	I	D
Yes/No	C	C	#
Word or phrase	U or C	U or C	U or C
Probability	C	#	C
Scale value	C	#	C
Number or Amount	C	C	C

Question Types
Q - a substantive or procedural question
I - an incomplete or unfinished question or phrase
D - a stored response from a previous question is displayed as part of a question

Branching Patterns
U - an unconditional or response independent branch
C - a conditional or response dependent branch
- this category in the matrix does not occur in DECAID

future conditional branching should be designed and programmed for these models.

Present Content and Structure of DECAID

At present DECAID attempts to help people define their decision questions, list appropriate objectives, discover creative alternatives, and list arguments for and against the two "best" alternative courses of action. DECAID also helps a person audit his decision process. DECAID currently has eight phases in its decision process: QUEST, VRMYET, INFO, GOALS, ALTGEN, ALTEVA, CHOICE, and AUDIT (see Figure 2 and Table 3). In addition the DECAID program serves as a control system. The eight DECAID phases are currently sequenced to follow a prescribed decision process (see Figure 1). Four phases, QUEST, GOALS, ALTGEN and AUDIT, require creative-divergent efforts from users. The other four phases, VRMYET, ALTEVA, CHOICE, and INFO, require convergent efforts (see Table 3). These convergent components have received most of the emphasis in the decision making literature. The divergent components are the main focus of DECAID and its main contribution. The DECAID phases and models are based on the work of

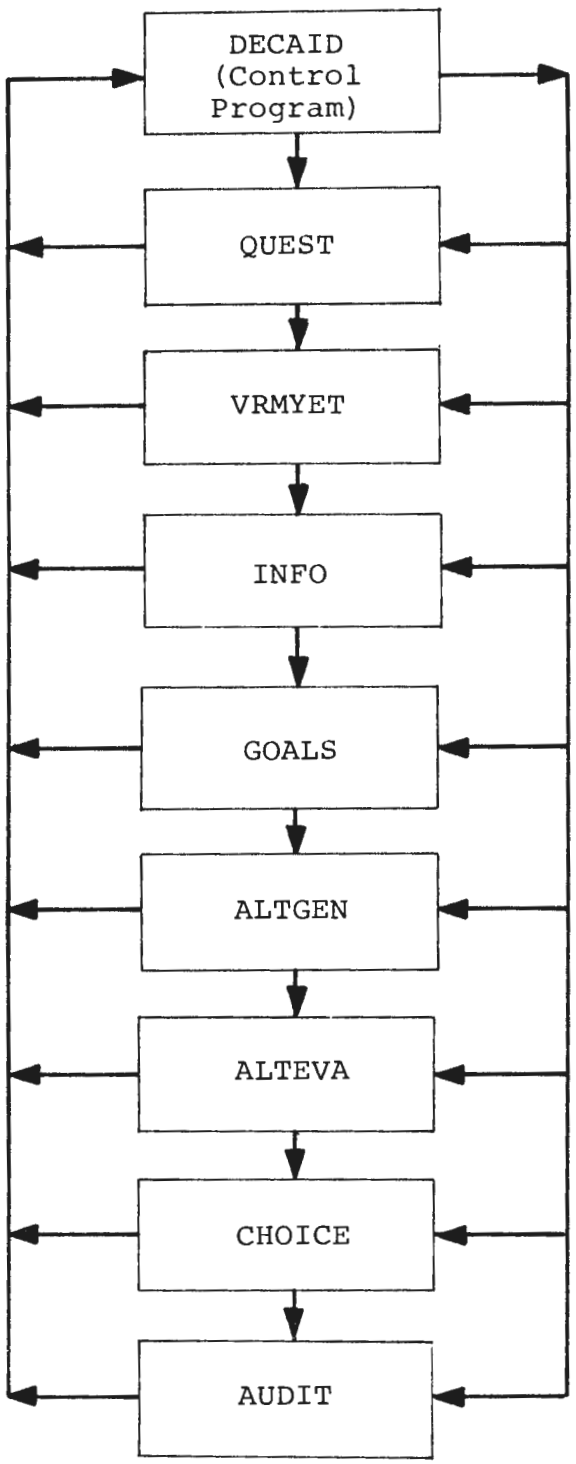


Figure 2. The relationships between the nine major programs in DECAID.

Table 3

Divergent and Convergent Phases
in the DECAID System

DECAID Identifier	Expanded Identifier	Type
QUEST	Question Definition Phase	D
VRMYET	Decision Process Evaluation Phase	C
INFO	Information Evaluation Phase	C
GOALS	Goal Evaluation Phase	D
ALTGEN	Alternative Generation Phase	D
ALTEVA	Alternative Evaluation Phase	C
CHOICE	Choice Process Phase	C
AUDIT	Audit Phase	D

D - divergent phases

C - convergent phases

Harrison (1975), Easton (1973), Soelberg (1970), Simon (1945,1960), Vroom and Yetton (1973), and many others.

Divergent Phases

The question definition phase, QUEST, is designed to help people: 1) minimize the probability of defining an inappropriate decision question (e.g., committing an error of the third kind); 2) view their decision situation creatively; and 3) define a simple, direct and unambiguous decision question. The text sections state the objectives of this divergent phase and explain the importance of avoiding an error of the third kind. The first sequence asks the student to identify and characterize his decision situation. A sequence of open-ended thought provoking questions in a subroutine, IDEAS, can then be used to stimulate different perspectives on the decision situation (e.g., The question put in another way could be likened to ...). After completing IDEAS, the student stores his decision question in DECAID's memory. This stored decision question is then redisplayed during the logical and structural analysis section of QUEST. When a student's response indicates that he can improve or restate his decision question, DECAID asks the student to enter his

new decision question. The question definition phase ends when the student's responses to the analysis questions indicate that he has defined a "best" decision question. This final decision question is redisplayed by DECAID at appropriate points in remaining phases.

GOALS, objectives and ideals are recognized in DECAID as essential to the decision making process. GOALS, the goal evaluation phase, assumes that goals and objectives have been defined by the organization. GOALS then helps the student rank, clarify and evaluate their goals in terms of the decision question specified in QUEST. This sequence also explains the importance of stating goals and objectives. The student then enters appropriate goals. These goals are displayed as the student answers the goal analysis questions. These questions ask about goal priorities, about the ability to quantify the goal and about the relationships among relevant goals.

Generating alternative courses of action is also fundamental in decision making. ALTGEN, the alternative generation phase, does this in DECAID. First, it uses text sections to emphasize the importance of identifying alternatives. Then, it attempts to avoid premature closure by stimulating futuristic ("What if ...?") and lateral ("Why not try ...?") thinking about

alternatives. DECAID also uses Hegelian type questions (Churchman,1971) to ask "What if you did just the opposite?" or "What if you did nothing at all?"

In a normative decision process two additional divergent phases would follow ALTGEN. These phases, STATE and OUTCOM, are not programmed. The alternative evaluation phase, ALTEVA, partially compensates for this by mentioning the importance of 1) estimating the states of nature and/or action of others and 2) estimating the consequences of the decision maker's actions and the actions of others under each state of nature.

AUDIT helps the user evaluate the quality of his decision process. This divergent phase attempts to help a user review the important criteria associated with an effective decision making process.

Convergent Phases

VRMYET, the Vroom-Yetton (1973) model helps a DECAID user converge on an appropriate decision process. In the DECAID version of this model, one additional question has been added, also hints and restatements of the questions are programmed. Finally, a computerized glossary has been linked to the model. Users can receive information from it about the meaning and

implications of an element in the feasible set determined by the model.

Alternative evaluation, ALTEVA, a convergent component of DECAID, occurs next in sequence. This phase helps the student specify and compare the consequences of various actions. A student enters his alternatives in memory so that DECAID can display the possible actions during its iterative evaluation routine. Students consider both general questions and more specific organizational behavior questions for each alternative. When a course of action is impractical, unworkable, or disadvantageous DECAID often points this out. Finally, this section has a routine which helps the student specify guidelines to use in making a final choice.

CHOICE, the choice phase, pairs arguments for and against what the student has determined are his two best alternatives. DECAID stores the pro and con arguments and displays them in a format that helps the student compare and contrast the strengths of the arguments. DECAID then asks the student which alternatives has more support or less opposition when arguments are weighed subjectively.

An information and decision question evaluation phase, INFO, is also found in a standard DECAID

sequence. This phase seeks to evaluate: 1) the need for additional information; and 2) the appropriateness of using mathematical programming, simulations and similar techniques for finding an optimal solution. When DECAID is used with critical incidents this section helps students realize that you cannot always obtain additional information. The sequence of questions designed to meet the second objective of this section relies on models that distinguish programmable from nonprogrammable decision questions (Simon, 1960).

DECAID Control System

The control system, DECAID, has informational materials for new users. It has a short question sequence which checks to make certain that the student has identified an organizational decision situation. It also has a sequence that distinguishes organizational problems from opportunities and then proceeds with separate methodology for each situation type. Finally, it has a sign off routine that allows experienced users to specify that when they return to DECAID they will enter at the DECAID controller. The controller asks the user to specify what phase or subroutine he will enter.

Sign off provides a smooth end for DECAID users no matter what path led them to that point.

CHAPTER V

TESTING DECAID

Transforming the conceptualization of DECAID into an interactive, computer-based program has been a formidable undertaking. As part of the development process three "versions" of DECAID have been tested with three different groups of students. The following discussion reviews the development process, enumerates evaluation problems and testing limitations, and documents the method and results for three developmental testing cycles.

Development Process

Development of DECAID followed a model which provides for incremental and exploratory changes and additions within a systematic framework. The model (see Figure 3) used for developing the set of programs called DECAID includes five separate steps or processes. First, routines are designed and flow-charted. Second, routines are programmed. Third, monitored use of the routines by naive subjects occurs to "debug" the programs. Fourth, developmental testing occurs where attitude data, performance data and protocols (Newell and Simon, 1972) are collected. And fifth, the information collected during developmental testing is evaluated and statistically analyzed. These steps are

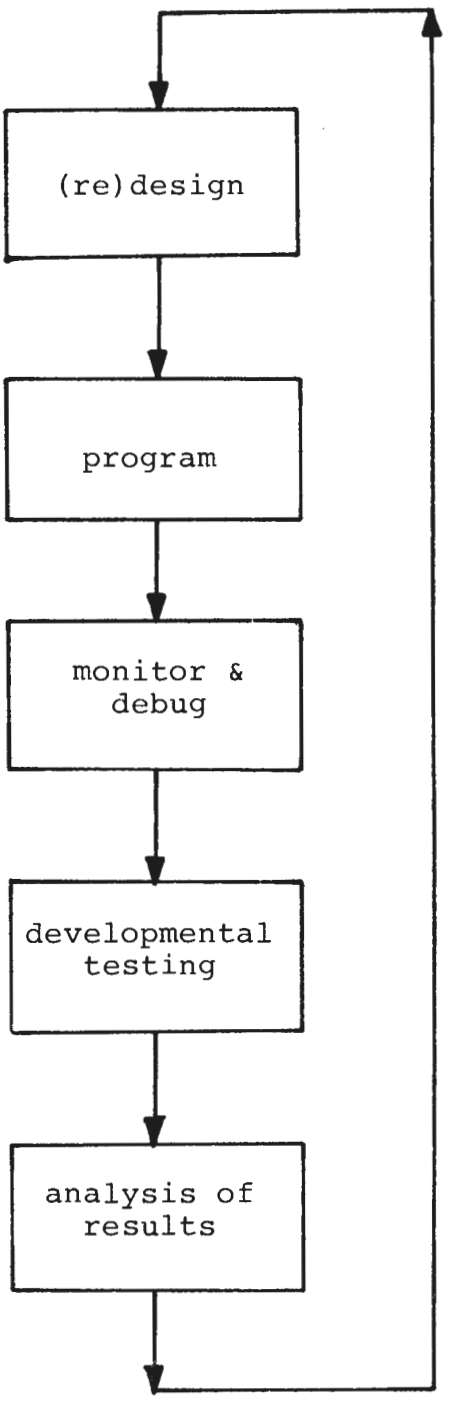


Figure 3. The five step model used to develop DECAID.

usually repeated because modification of routines is commonly indicated by the analysis of results.

Testing Limitations

Developmental Testing of DECAID has relied little on the methodology of experimental design. It has been difficult to use these designs because of problems associated with the random assignment of subjects, within the same classroom, to different treatments.

Although a pre-experimental and a quasi-experimental design (Campbell and Stanley, 1963) are reported as part of the developmental testing of DECAID, most of the improvements and changes in the programs resulted from observation of users, personal use and analysis of verbal and hard-copy protocols (Newell and Simon, 1972). An attitude questionnaire "Student Attitudes Toward DECAID and CAL" and two general performance measures also provided information about the effectiveness of DECAID as a computer aided learning system.

The development of performance measures has been a particular problem. Milner and Wildberger (1974) discuss this problem for a program category which encompasses DECAID. They suggest that "because of the

very nature of this real-life problem solving, it is extremely difficult to visualize how we could test or evaluate whether a student who has used a computer in this problem solving mode will in fact be more able to solve real-life problems, but it is intuitively attractive to believe that he could" (p. 9).

Because it is difficult to establish the external validity of a program like DECAID, i.e. establish that DECAID users will be "more able to solve real-life problems". The performance evaluation of DECAID has relied on a variety of criteria. Although the ultimate criterion is the adequacy of the decision process that DECAID stimulates and the transfer of that process to the user, it is difficult to measure this criterion. Retrospectively, a number of indicators may have provided information about the attainment of this criterion: the number of alternatives or decision questions considered, the logical consistency of the decision question, the decision reached using DECAID, and the effects of instructive, informational and motivating messages (Ackoff, 1958) on the decision question, the set of alternatives, and the outcome estimates. At the time developmental testing began, more pragmatic criteria were substituted for these indicators because of interpretation problems and

failure to recognize their potential significance. Two types of evaluation techniques were actually used in developmental testing. The first type might be categorized as a content approaches, i.e. recall and recognition of decision process concepts. The second type can be categorized as subjective approaches, i.e. evaluation of protocols, observation and evaluation of user behavior and evaluation of management reports.

Developmental Testing

Three developmental testing cycles were conducted with the IDF versions of DECAID. The first phase occured in the Summer of 1976; the second was conducted in the Fall of 1976; and the third was undertaken in the Spring of 1977. Subjects in all of the studies were volunteers and all were enrolled in courses in the College of Business Administration at the Universtiy of Iowa. The demands of developmental testing did not require large numbers of subjects and the experimental nature of DECAID coupled with administrative constraints in the College of Business resulted in a small sample size in each of the three phases of developmental testing.

First Phase

Participants in the first phase of the testing included 12 MBA students and 10 undergraduate business students. Prior to supervised use of DECAID, all subjects were given a "White Implement Company" Critical Incident, (see Appendix 7) a detailed instruction sheet (see Appendix 1) and a DECAID Student Manual (see Appendix 8). When the student volunteers arrived at the Business School Computer Lab to use DECAID they were asked to complete a short pretest (see Appendix 3). The pretest focused on recognition and recall of concepts associated with a normative decision process. For example, two test items asked the subject to describe what decision process he/she would use given a short description of a particular decision situation.

Following the pretest subjects were encouraged to review the White Company incident for five minutes. Next they logged onto an HP-2000/ACCESS System using a cathode ray tube terminal. Those who were unfamiliar with this procedure could consult the DECAID Student Manual or request help from a proctor. After signing on the computer using an Instructional Management Facility user number (Hewlett Packard, 1975) students followed a procedure outlined in the DECAID Student Manual for

requesting DECAID. Once DECAID had been requested students began responding to its inquiries in the context of the facts in the White incident.

Completing DECAID was difficult for some. Although one student completed the sequence in 55 minutes and the mean was 75.35 minutes, two students were in the alternative generation phase of the program after 105 minutes (see Appendix 11). The two who failed to complete the sequence in a reasonable amount of time appeared to have problems with English vocabulary and usage which may account for their difficulties. Those who completed DECAID retook the pretest and completed a 30 item attitude questionnaire (see Appendix 5). The attitude questionnaire, Student Attitudes Toward DECAID and CAL, was a modified version of a questionnaire developed by Brown (Brown, 1966). Analysis of this data suggested that further development was justified. Subjects performed significantly better on the post-test than on the pre-test ($t = 2.54$; p .01) performance measure (see Appendix 4). The mean of the summed responses from the attitude questionnaire averaged more than one standard deviation beyond the scales' point of indifference, i.e. 90 (see Table 4). Analyses of specific attitude questions showed that students were satisfied with what they learned while using DECAID (see

Table 4

Means, Standard Deviations, Minimum and Maximum for Student Attitudes Toward DECAID and CAL Questionnaire* - 3 Developmental Testing Groups**

Group	Count	Mean	Standard Deviation	Minimum	Maximum
GRP01	21	102.4762	12.2091	78.0000	123.0000
GRP02	12	98.3333	11.4203	83.0000	124.0000
GRP03	10	97.0000	17.0033	67.0000	117.0000
Total	43	100.0465	13.1565	67.0000	124.0000

*Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

**Cycle 1 - Summer 1976 (n = 21)
Cycle 2 - Fall 1976 (n = 12)
Cycle 3 - Spring 1977 (n = 10)

Table 5). However, many found themselves "just trying to get through" the material and few felt the program was "superior" to traditional instruction (see Table 6). Computer recorded protocols were also examined for bugs in the program and ambiguities in DECAID questions.

Second Phase

When changes based on data collected in the first testing phase had been programmed, a second testing period was conducted to provide information on student use of DECAID in uncontrolled and/or nonproctored situations. It involved 12 junior and senior undergraduate volunteers in an introductory management course. These students were given the White Implement Company Incident and the DECAID Student Manual and were instructed to use the teletype terminals in the various computer labs on campus at their own convenience. They were required to write a "Formal Management Report" using the White Implement Company incident, return protocols and complete the attitude measure (see Appendix 6). The remaining 22 students in the class also prepared a Formal Management Report, but they did not have access to DECAID. Only minimal instructions were provided. The suggested content of the report

Table 5

Selected Positive Results From
Student Attitude Toward
DECAID and CAL
(Short Form)*

Questions	Item Means Developmental Testing Cycles		
	1	2	3**
The material presented to me by Computer Aided Learning (CAL) caused me to feel that no one really cared whether I learned or not. (Strongly Agree = 1; Strongly Disagree = 5)	3.8	4.0	3.5
As a result of having studied some material by Computer Aided Learning I want to find out more about the subject matter. (Strongly Disagree = 1; Strongly Agree = 5)	3.6	3.5	3.3
Questions were asked which I felt were not relevant to the decision making process. (Never = 1; All the Time = 5)	4.3	3.7	4.2
DECAID is an inefficient use of the student's time. (Strongly Agree = 1; Strongly Disagree = 5)	3.5	3.8	3.7

*Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

**Cycle 1 - Summer 1976 (n = 21)
Cycle 2 - Fall 1976 (n = 12)
Cycle 3 - Spring 1977 (n = 10)

Table 6

Selected Negative Results From
Student Attitude Toward
DECAID and CAL
(Short Form)

Questions	Item Means Developmental Testing Cycles		
	1	2	3**
I felt uncertain as to my performance in the programmed course relative to the performance of others. (All the Time = 1; Never = 5)	2.7	2.8	2.4
I was aware of efforts to suit the material specifically to me. (Strongly Disagree = 1; Strongly Agree = 5)	3.3	2.3	3.0
I felt frustrated by DECAID. (Strongly Agree = 1; Strongly Disagree = 5)	2.7	2.9	2.9
In view of the amount I learned, I would say this exercise is superior to traditional instruction. (Strongly Disagree = 1; Strongly Agree = 5)	2.9	2.5	3.0

*Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

**Cycle 1 - Summer 1976 (n = 21)
Cycle 2 - Fall 1976 (n = 12)
Cycle 3 - Spring 1977 (n = 10)

included problem definition, possible causes, and potential solutions.

The management reports were graded by the regular course instructor as part of the student's final grade in the introductory management course. The attitude questionnaires, the hard copy protocols and students' verbal comments were analyzed to help determine what changes were necessary in DECAID. Based on these data DECAID was again revised to include Vroom and Yetton's (1973) model, the //HINT command in basic program components, additional hints, more explanatory materials and modified questions in the alternative generation and evaluation phases.

Third Phase

The third phase involved 24 members of an introductory management class. It followed the same general procedures as the first phase (see Appendix 2) except that no formal proctoring occured. Students, however, signed up to use DECAID during specified periods when a proctor was available for consultation. Again a pre and post-test was administered. This test was developed from a list of behavioral objectives (Mager, 1973) for DECAID (see Appendix 9) and included

11 multiple choice items and one open-ended question (see Appendix 4). It measured recall and recognition of concepts associated with the decision making process. No measure of the quality of actual decision making behavior was included. A quasi-experimental design (Campbell and Stanley, 1963) was used with the pre and post-test to help assess whether learning of the behavioral objectives occurred. Both treatment and control groups contained 12 students.

Mean pre-test scores were not significantly different for the two groups (see Appendix 11). However, the post-test results reflected significantly better performance by students using DECAID ($t = 2.63$, $p < .05$). Completion time for this version of DECAID was in excess of two hours and this may have adversely affected students' attitudes (see Appendix 12 and Tables 5 and 6). Although analysis of attitude data demonstrated a lower mean for the summed responses than those found in the first two phases, an ANOVA indicated no significant differences. But, one should not draw strong inferences from this test because subjects were not assigned randomly to the three testing phases.

Discussion

Various problems occur in attempting to draw conclusions from the results that have been reported, a few comments are in order. One must keep in mind that the primary purpose of the DECAID Project was to design and develop the DECAID programs; determining the educational merit of the programs has been of secondary concern. DECAID must undergo extensive development before its potential can be realized. Future developmental testing should: 1) use an experimental design; 2) use ultimate criterion measures of performance, i.e. the number of changes in the decision question, the number of alternatives considered; and 3) compare future attitude data to the baseline established in the first three phases of developmental testing. Until such testing occurs the performance and attitude results of the first three phases must be viewed as indicative of the potential of DECAID, rather than as statistically significant.

Despite these reservations, it is necessary to stress that the important information for developmental purposes was the protocols. Although each one must be analysed individually, they contain a wealth of information about modifications and additions that

should be included in future versions of DECAID. The IDF statistics and response file features were, it should be noted, used only in the initial testing cycle. In subsequent cycles the protocols provided response information in a more understandable format. Finally, although failure to maintain statistics files may have been a gross oversight, the nature of the DECAID questions and the program itself resulted in summary statistics from IDF, i.e. mean latency and percentage ultimately successful, which were uninterpretable for program modification.

CHAPTER VI

EVALUATION OF DECAID

In business organizations computer systems have been evaluated in terms of costs and benefits; computer assisted instruction programs are also often evaluated in this way. In spite of the obvious difficulties associated with quantifying costs and benefits, it is especially difficult to apply these "hard" measures to a system like DECAID which is concerned with aiding the management decision process (Keen, 1975).

The task of evaluating DECAID is further complicated because: few comparable projects have been reported (e.g. Urban, 1974); 2) development of the DECAID system is ongoing; 3) use of DECAID has been limited to developmental testing situations; and 4) DECAID has not been evaluated in field settings. For these reasons it is difficult to apply traditional criteria used to evaluate instructional materials and computer-based decision aids to DECAID (Keen, 1975; Dick and Gallagher, 1971). But, it is clear that until the project is completed or terminated, evaluation of the DECAID project must occur; and because a new version of the program is in the planning stage, it is now especially important to evaluate DECAID.

The following criteria are appropriate to the DECAID project and should influence conclusions and recommendations made about it: 1) is the idea workable?

2) has the project resulted in additional benefits? 3) were the costs in dollars and time required to reach this stage in the project worth paying? 4) are the anticipated costs in dollars and time of the next stage in the project worth paying? (c.f. Keen,1975) 5) does DECAID help the decision maker reduce the probability of committing as error of the third type? 6) does DECAID stimulate the user to search for diversity in the decision situation, evaluate uncertainties associated with alternatives and in general practice rule generation (Schroder, Driver and Streufert, 1967)? 7) does DECAID help the decision maker avoid premature closure? and 8) does DECAID improve the quality of the decision?

It is possible to list the approximate costs of the DECAID project (see Table 7). But, it is much more difficult to evaluate the costs because they are estimates and because the labor involved was essentially a free good. Outside of a cost-benefit framework one can conclude that the time spent on the project is quite large considering the current state of the material, but actual dollar costs of the project have been small.

Before proceeding with a discussion of the positive and negative aspects of the DECAID project (see Table 8), it is important to note that the conclusions about

Table 7

Estimated Design and Development
Costs for DECAID

Categories	Costs
Design, research, flowcharting.	240 hours
Programming	140 hours
Consulting assistance	35 hours
Developmental testing	55 hours
Write manuals, cases, exercise, etc	20 hours
Computer time (HP System)	225 hours
Computer time (IBM System).	$400.00
Xeroxing, duplicating, etc.	$ 75.00

Table 8

Summary of Positive and Negative Aspects of the DECAID Project

Positive Aspects	Negative Aspects
1. Progress toward objectives	1. Problems with providing reinforcement
2. Confirmation of question sequences as building blocks for heuristic models	2. Semantic problems with questions
3. Increased interest in using the computer in higher order decision situations	3. Problems with the Instructional Dialogue Author Facility and IDF program components
4. Creating, improving and documenting heuristic decision models	

the DECAID programs are based on personal use, as well as observation of users and evaluation of protocols. Some of the comments are also supported by the attitude and performance data reported earlier.

Positive Aspects

First, some progress has been made toward meeting the objectives of the project. Using DECAID with a decision incident as a computer aided learning system is workable and it is possible that such a method may eventually help people improve their decision making behavior.

Research using DECAID or a similar program may help people: 1) explain how decisions are made; 2) explain how decisions should be made; 3) predict how changes in a decision situation alters the decision making process; 4) explain how decision making skills are learned; and 5) predict the decision process employed with a specific higher order decision task.

Second, the feasibility of using questions as the building blocks for decision models has been clearly demonstrated. A careful review of the literature related to strategic decisions has also been conducted since the conceptualization of DECAID; the number of

authors found using this method is surprisingly large (c.f. Cyert and March, 1963; Easton, 1973; Mager, 1973; Rose, 1974; Bennet, 1974; Urban, 1974; Flesch, 1946). International Business Machines (IBM) has also used decision heuristics based on the question technique as visual aids in various user manuals. Teaching is some disciplines, law and medicine in particular, has also sometimes involved learning models built from questions.

Third, the DECAID project has generated interest in using the computer to help decision makers in strategic decision situations. Papers presented at National Meetings of the American Institute for Decision Sciences (Power and Rose, 1976; Power and Rose, 1977) were well received and generated some favorable comments and inquires for more information about DECAID. A deliberate attempt has been made to minimize promotion of DECAID because it is in its infancy from both a conceptual and programming standpoint; but a more sophisticated version which was transportable, would most likely generate additional attention which might yield substantive modification and improvement of the models.

Fourth, the DECAID project is creating and documenting decision models. The task of creating these models is quite difficult because the sequence of

questions for a model is debatable, but in the long run it may be the most significant contribution of the project.

Negative Aspects

First, the vastness and complexity of the DECAID project was underestimated. This occured because the task of developing interactive decision models is a relatively new one. Also, behavioral validation must be attempted for each model and peer evaluation of the sequences must occur. Many new models and tutorials must be designed, validated, programmed and tested because many parts of the decision process are not adequately developed.

Second, providing appropriate reinforcement of user responses has been difficult. This is especially true with regard to maintaining a supportive, friendly, conversational tone throughout the program sequences.

Third, semantic problems with questions and text materials still exist in the programs. The reading level associated with the program has not been specified; and hints intended to provide alternative

question statements do not exist for all questions in DECAID.

Fourth, technical problems associated with the Instructional Dialogue Author Facility Program (Hewlett Packard, 1975), i.e. error correction, adding and deleting text and questions, and lack of a memory (other than in BASIC components), have severely hindered development of DECAID. A proliferation of small basic programs became necessary because of limitations in IDAF, but this unplanned structure hinders plans for transporting or documenting the system (see Appendix 14).

Conclusions and Recommendations

DECAID is an evolving program and the results to date are generally favorable. But it is evident that programming and development costs have been substantial. And one must consider the possibility that the costs even exceed the benefits. However, the potential of this project for business and education uses and the importance of the decision making process justifies the time and effort spent to date.

Future work on DECAID must, however, be based on the premise that the benefits of the project will

ultimately be evaluated favorably. But, because problems associated with this project remain large, i.e. availability of resources and model validation, the resolution of these issues will ultimately determine the practicality of future development. Prior to future work on DECAID the following steps should be taken: 1) assess realistically the resources that are available for DECAID--Version 5; 2) create a more detailed list of the objectives of the DECAID system and assign priorities; 3) discuss project responsibilities with all current participants; and 4) evaluate performance indicators that can be used in ongoing evaluation of the project. After completing these steps a final "go-no go" decision should be made (see Keen, 1975).

It is appropriate to conclude that DECAID must be improved and expanded if it is to realize its suggested potential for management education. If the DECAID project continues the following activities should receive the highest priority: 1) evaluate the behavioral content of models; 2) program the tutorials UNCER and GAME; 3) program DECAID in BASIC ((Hewlett Packard, 1975); 4) program routines associated with a decision theory approach, i.e. determine states of nature and evaluate outcomes for each state of nature-alternative pair; 5) prepare documentation, i.e.

student, teacher and system manuals, so that DECAID can be transported to other universities; and 6) any new version of DECAID should be field tested and undergo peer evaluation (see CONDUIT Documentation Guidelines, 1974).

New models should also be an aim of future development efforts. Some thought has already been given to development of the following models:

1) a problem-finding routine, i.e. a search heuristic.
2) a problem-analysis routine, i.e. a heuristic which helps determine the cause of a problem.
3) a checklist which evaluates the decision maker's search of the information environment (Bennet, 1974).
4) an evidence analyzer which focuses on fallacies and rules of evidence.
5) a goal generation and goal definition routine, i.e. a heuristic which helps identify and write goals.
6) a routine that helps the decision maker decide what tools, such as the Nominal Group Technique (Delbecq, Van de Ven and Gustafson, 1975) should be used to generate alternatives.
7) a cost-benefit type and a cost-effectiveness type routines.
8) a multiple-goal evaluation routine (Easton, 1973).
9) a decision implementation routine.

10) a report utlity to summarize the decision question, goals, and alternatives.

APPENDIX 1

DECISION MAKING EXERCISE - CYCLE 1

DECISION MAKING EXERCISE

PURPOSE: This exercise attempts to demonstrate the importance and complexity of the decision making process.

ADVANCE PREPARATION: Read the White Implement Company critical incident. Read the DECAID Student Manual.

TIME REQUIRED: One hour and forty minutes.

INTRODUCTION: This exercise uses a critical incident and a computer program named DECAID to help your develop decision making skills. You will not become a proficient decision maker after one exercise and you will not be expected to demonstrate that skill. You will be expected to list stages you would probably go through to resolve a decision situation. You will be expected to generate questions you might ask if you were trying to resolve a decision situation. You will be expected to recognize the importance of defining precisely your decision question before you attempt to analyze the question. And finally, you will be expected to recognize terms used by DECAID to describe the decision making process.

PROCEDURE:

STEP 1. (5 minutes) Review the White Implement Company critical incident. Review the DECAID Student Manual.

STEP 2. (50 minutes) Log on at a Bee Hive terminal in the Computer Lab, get the DECAID program and use the program to resolve the situation presented to you in the White Implement Company critical incident. REMEMBER YOU ARE THE DECISION MAKER, DECAID IS A DECISION AID.

STEP 3. (15 minutes) Complete a short test designed to assess your achievement of the educational objectives established for DECAID and this exercise.

STEP 4. (15 minutes) Complete an attitudinal questionnaire about DECAID and about Computer Managed and Computer Aided Learning.

APPENDIX 2

DECISION MAKING EXERCISE - CYCLE 3

Using DECAID--A Decision Making Exercise

PURPOSE: This exercise attempts to demonstrate the importance and complexity of the decision making process.

ADVANCE PREPARATION: Read the White Implement Company critical incident. Read the DECAID Student Manual.

TIME REQUIRED: One hour and twenty minutes.

INTRODUCTION: This exercise uses a critical incident and a computer program named DECAID to help you develop decision making skills. You will not become a proficient decision maker after one exercise and you will not be expected to demonstrate that skill. You will be expected to list stages you would probably go through to resolve a decision situation. You will be expected to generate questions you might ask if you were trying to resolve a decision situation. You will be expected to recognize the importance of defining precisely your decision question before you attempt to analyze the question. And finally, you will be expected to recognize terms used by DECAID to describe the decision making process.

PROCEDURE (After you arrive at the Phillips Hall Computer Lab):

STEP 1: Sign your name on the DECAID Register.

STEP 2: (5 minutes) Review the White Implement Company critical incident. Review the DECAID Student Manual.

STEP 3: (65 minutes) Log on at a computer terminal in the Computer Lab, get the DECAID program (see the DECAID Student Manual) and use the program to help resolve the situation presented to you in the White Implement Company critical incident. REMEMBER YOU ARE THE DECISION MAKER, DECAID IS A DECISION AID.

STEP 4: (1 minute) Type //STOP when you complete DECAID, then logoff at the terminal.

APPENDIX 3

DECISION MAKING QUIZ - CYCLE 1

Experimenting with Decision Making Behavior

NAME _____ DATE _____

Please answer each question. You should write your answers in the space provided.

Assume that you are a division manager for a medium sized midwestern corporation. You must select a key staff member from a field of five carefully screened applicants. Explain how you will make this decision. (A list of steps is acceptable, but you may write a short paragraph.)

Assume that you have the responsibility of selecting a new marketing strategy for a mature product line. You have narrowed your possible strategies to two. How would you proceed to make a choice?

As you make decisions you will make mistakes, one error which can occur has been called the error of the third kind. This error occurs when you define an inappropriate _____ _____.

TRUE AND FALSE.

You must understand what your decision question is, before you can make complex, multiple objective decisions. _____

When you are in a crisis situation you should rely on your intuition. _____

You can't learn how to make decisions. You must just make them and then evaluate the consequences. _____

If you spend time thinking about your decision or about what you must decide, you may decide not to make a decision. _____

The objectives of the company should not be evaluated before you make your decision. You know what they are and so does everybody in the organization. _____

It's not what you decide, but how you implement it that counts. _____

APPENDIX 4

DECISION MAKING QUIZ - CYCLE 3

DECISION MAKING QUIZ

1. What are the first two steps in a normative decision process model?

a. Define the decision question, determine the decision process
b. Define the problem, generate alternatives
c. Determine the appropriate decision process, define goals
d. Define question, define relevant goals
e. NONE OF THE ABOVE

2. What are the primary characteristics of a programmable decision?

a. Well organized, understood, common, etc.
b. Routine and/or recurring
c. Prespecified decision process
d. Quantifiable
e. ALL OF THE ABOVE

3. What is an error of "the third kind"?

a. Rejecting a decision question
b. Accepting a decision question
c. Defining the wrong null hypothesis
d. Defining a one-sided hypothesis
e. Defining an inappropriate question

4. At what stages in a decision process can premature closure effect the outcome of the process?

a. Convergent stages
b. Conjuntive stages
c. Divergent stages
d. Disjunctive stages
e. NONE OF THE ABOVE

5. What is premature closure?

a. Reaching a decision too quickly
b. Assuming that enough alternatives have been specified
c. Completing a stage in the decision process before its objectives have been met
d. Determining that the subset of alternatives selected is incomplete or inadequate
e. NONE OF THE ABOVE

6. What goals might be specified as part of a normative decision process for "wicked" decisions?

a. Environmental goals
b. Personal goals
c. Organizational goals
d. a and c
e. ALL OF THE ABOVE

7. What rhetorical characteristics of a decision question should be evaluated as part of a normative decision process?
   a. Is it simple and direct
   b. Is it clear and concise
   c. Is it written from an organizational perspective
   d. a and b
   e. ALL OF THE ABOVE

8. What is the dependency in a normative model between the stage where organizational goals are specified and the stage in the process where alternatives are evaluated?

   a. No dependency
   b. Occur simultaneously
   c. Specify goals then evaluate alternatives
   d. Specify goals, generate alternatives and then evaluate alternatives
   e. Determine the process, determine the cause of the problem, generate solutions, apply goals to alternatives

9. What are the divergent phases in a normative decision process model?

   a. Specify relevant goals - GOALS
   b. Generate alternatives - ALTGEN
   c. Evaluate alternatives - ALTEVA
   d. a and b
   e. b and c

10. When a decision maker evaluates decision alternatives, he considers only part of the set of possible alternatives. He can perceive and comprehend only a limited amount of information and that limits the number of alternatives that can be evaluated. What is this phenomenon called?

   a. Restricted cognitive processing (RCP)
   b. Bounded rationality
   c. Perceptual distortion
   d. Satisficing behavior
   e. NONE OF THE ABOVE

11. What choice process is most often used by a decision maker when he selects between his two "best" alternatives?

   a. Weighted choice model
   b. Multi-attribute decision model
   c. Pro-con balancing strategy
   d. Cost-benefit analysis
   e. Personal heuristic

12. Now list the questions which you might ask a decision maker to help him make a "wicked" or ill-defined decision. You must assume that you have no knowledge of his decision situation. You must structure the sequence of you questions based on his responses.

APPENDIX 5

STUDENT ATTITUDE TOWARD DECAID AND CAL (SHORT FORM)

STUDENT ATTITUDE TOWARD DECAID AND CAL

Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

This is not a test of information; therefore, there is no one "right" answer to a question. We are interested in your opinion on each of the statements below. Your opinions will be strictly confidential. Do not hesitate to put down exactly how you feel about each item. We want information, not compliments; please be frank.

NAME:_____ DATE:_____

CIRCLE THE RESPONSE THAT MOST NEARLY REPRESENTS YOUR REACTION TO EACH OF THE STATEMENTS BELOW:

1. While using DECAID I felt challenged to do my best work.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

2. The material presented to me by Computer Aided Learning (CAL) caused me to feel that no one really cared whether I learned or not.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

3. The method by which I was told DECAID's opinion of my responses became monotonous.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

4. While using DECAID I felt isolated and alone.

All the time	Most of the time	Some of the time	Only occasionally	Never

5. DECAID's responses to my answers seemed appropriate.

All the time	Most of the time	Some of the time	Only occasionally	Never

6. I felt uncertain as to my performance in the programmed course relative to the performance of others.

All the time	Most of the time	Some of the time	Only occasionally	Never

7.I found myself just trying to get through the material rather than trying to learn.

All the time	Most of the time	Some of the time	Only occasionally	Never

8.I guessed at what some of the questions meant.

Quite often	Often	Occasionally	Seldom	Very Seldom

9.I was encouraged by the responses given to my replies.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

10.As a result of having studied some material by Computer Aided Learning I want to find out more about the subject matter.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

11.In view of the time allowed for learning, I felt too much material was presented.

All the time	Most of the time	Some of the time	Only occasionally	Never

12.I was more involved in running the machine than in understanding the material.

All the time	Most of the time	Some of the time	Only occasionally	Never

13.I felt I could work at my own pace.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

14.I felt as if I had a private tutor while on DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

15.I was aware of efforts to suit the material specifically to me.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

16.The Computer Aided Learning situation made me feel quite tense.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

17.Questions were asked which I felt were not relevant to the decision making process.

All the time	Most of the time	Some of the time	Only occasionally	Never

18.DECAID is an inefficient use of the student's time.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

19.I put in answers knowing they didn't make sense in order to see what DECAID would do.

Quite often	Often	Occasionally	Seldom	Very Seldom

20.I was allowed to continue by DECAID but I still did not understand the questions at times.

Quite often	Often	Occasionally	Seldom	Very Seldom

21.DECAID made it possible for me to learn quickly.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

22.I felt frustrated by DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

23.I could have learned more if I hadn't felt pushed.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

24.The Computer Aided Learning approach is inflexible.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

25 .Even otherwise interesting material would be boring when presented by the Computer.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

26 .In view of the effort I put into it, I was satisfied with what I learned while using DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

27 .In view of the amount I learned, I would say this exercise is superior to traditional instruction.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

28 .With a subject like decision making, I would prefer Computer Aided Learning to traditional lectures.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

29 .I am not in favor of Computer Aided Learning because it is just another step toward de-personalization of learning.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

30 .I have had extensive training in decision making and inference behavior.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

APPENDIX 6

STUDENT ATTITUDE TOWARD DECAID AND CAL (LONG FORM)

STUDENT ATTITUDE TOWARD DECAID AND CAL

Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

This is not a test of information; therefore, there is no one "right" answer to a question. We are interested in your opinion on each of the statements below. Your opinions will be strictly confidential. Do not hesitate to put down exactly how you feel about each item. We want information, not compliments; please be frank.

NAME:_____ DATE:_____

CIRCLE THE RESPONSE THAT MOST NEARLY REPRESENTS YOUR REACTION TO EACH OF THE STATEMENTS BELOW:

1. While using DECAID I felt challenged to do my best work.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

2. The material presented to me by Computer Aided Learning (CAL) caused me to feel that no one really cared whether I learned or not.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

3. The method by which I was told DECAID's opinion of my responses became monotonous.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

4. I was concerned that I might not be understanding the material.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

5. I was not concerned about how I answered a question because no one was watching me anyway.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

6. While using DECAID I felt isolated and alone.

All the time	Most of the time	Some of the time	Only occasionally	Never

7. While using DECAID I felt as if someone were engaged in ccnversation with me.

All the time	Most of the time	Some of the time	Only occasionally	Never

8. DECAID's responses to my answers seemed appropriate.

All the time	Most of the time	Some of the time	Only occasionally	Never

9. I felt uncertain as to my performance in the programmed course relative to the performance of others.

All the time	Most of the time	Scme of the time	Only occasionally	Never

10. I fcund myself just trying to get through the material rather than trying to learn.

All the time	Most of the time	Scme of the time	Only occasionally	Never

11. I guessed at what some of the questions meant.

Quite often	Often	Occasionally	Seldom	Very Seldom

12. In a situation where I am trying to learn something, it is important to me to know where I stand relative to others.

Strongly Disagree	Disagree	Uncertain	Agree	Strcngly Agree

13. I was encouraged by the respcnses given to my replies.

Strongly Disagree	Disagree	Uncertain	Agree	Strcngly Agree

14. As a result cf having studied some material by Computer Aided Learning I want to find out more about the subject matter.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

15. In view of the time allowed for learning, I felt too much material was presented.

All the time	Most of the time	Scme of the time	Only occasionally	Never

16.I was more involved in running the machine than in understanding the material.

All the time	Most of the time	Some of the time	Only occasionally	Never

17.I felt I could work at my own pace.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

18.Computer Aided Learning makes learning too mechanical.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

19.I felt as if I had a private tutor while on DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

20.I was aware of efforts to suit the material specifically to me.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

21.I found it difficult to concentrate on the material because of the machine or computer terminal.

All the time	Most of the time	Some of the time	Only occasionally	Never

22.The Computer Aided Learning situation made me feel quite tense.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

23.Questions were asked which I felt were not relevant to the decision making process.

All the time	Most of the time	Some of the time	Only occasionally	Never

24.DECAID is an inefficient use of the student's time.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

25.I put in answers knowing they didn't make sense in order to see what DECAID would do.

Quite often	Often	Occasionally	Seldom	Very Seldom

26.Concerning decision making, my feeling toward this material before I used DECAID was:

Very Favorable	Favorable	Indifferent	Unfavorable	Very Unfavorable

27.I was allowed to continue by DECAID but I still did not understand the questions at times.

Quite often	Often	Occasionally	Seldom	Very Seldom

28.While using DECAID I encountered mechanical malfunctions.

Quite often	Often	Occasionally	Seldom	Very Seldom

29.DECAID made it possible for me to learn quickly.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

30.Concerning decision making, my feeling toward this material after I used DECAID was:

Very Favorable	Favorable	Indifferent	Unfavorable	Very Unfavorable

31.I felt frustrated by DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

32.The responses to my answers seemed to take into account the question that had been asked.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

33.I could have learned more if I hadn't felt pushed.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

34.The Computer Aided Learning approach is inflexible.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

35. Even otherwise interesting material would be boring when presented by the Computer.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

36. In view of the effort I put into it, I was satisfied with what I learned while using DECAID.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

37. In view of the amount I learned, I would say this exercise is superior to traditional instruction.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

38. With a subject like decision making, I would prefer Computer Aided Learning to traditional lectures.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

39. I am not in favor of Computer Aided Learning because it is just another step toward de-personalization of learning.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

40. Typing experience is necessary in order to perform easily on the machine.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

41. I have had extensive training in decision making and inference behavior.

Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree

APPENDIX 7

WHITE IMPLEMENT COMPANY INCIDENT

WHITE IMPLEMENT COMPANY

ROLE: You are the financial vice-president for White Implement Company.

THE FACTS: On April 1, 1976, Mr. John Holloway retired as the controller of the White Implement Company and was succeeded by Mr. Richard Flynn. Mr. Holloway had been with the company for 47 years and had been controller for the last 22 years. Mr. Flynn was new to the company. He was a 36-year-old graduate of a large midwestern university, had a graduate degree in finance and was a Certified Public Accountant. You had great faith in Mr. Flynn and felt that he would continue to run the accounting department in the same efficient manner that Mr. Holloway had.

Mr. Flynn had spent February and March working with Mr. Holloway and by April had become well versed in White's accounting system and the reports it was to generate. However, to give Mr. Flynn a chance to "get his feet on the ground," you had decided that no major changes should be attempted in the accounting methods, procedures, or routines for at least six months.

Recently, it became apparent to you that all was not well in the accounting department. The monthly operating statements were unusually slow in coming out, monthly closings were taking almost twice as long as they previously had, and two of the accounting personnel had quit. Both of these employees had been with the company for over 15 years and you must view their departure as a great loss.

Troubled by this unexpected turn of events and unable to get any ideas about the cause of the problem from a meeting with Mr. Flynn, you began to consult with the accounting staff concerning what had gone wrong in what had previously been one of the best departments in the company.

You first talked to Mrs. Pearl Ridler, the general ledger bookkeeper and a 24-year employee in the accounting department. Mrs. Ridler stated "We never know what we are doing these days. Mr. Flynn gives us a job assignment but he never tells us what to do on it. When I ask him a question, he ends up by asking me four questions to every one that I ask him. When Mr. Holloway was here, you got a straight-forward and fast answer to your questions; he knew his job."

You next talked to Mr. Winters, the accounts payable bookkeeper. Mr. Winter's complaint was, "All Mr. Flynn wants to do is talk. I need my problems solved, not a lot of talk." Finally, Mr. Frank Thomas, the cost accountant, commented, "Mr. Flynn is continually asking my opinion on things. I sometimes wonder who is really running the accounting department."

You have developed the following hypotheses about the cause(s) of the current crisis in the acccunting department:

H1: The employees in the accounting department had developed a dependent relationship with Mr. Holloway and they are not now motivated to act independently to solve their own problems. They have placed an unbearable burden on Mr. Flynn.

H2: Mr. Thomas is envicus of Mr. Flynn and he is attempting to sabotage the operaticns of the accounting department.

H3: The "no major change" policy may be restricting Mr. Flynn's ability to act. The policy may be forcing him to rely tco much on subordinates to execute his policy.

H4: Some employees view Mr. Flynn as incompetant and they are resisting his leadership and sabotaging the department.

H5: Mr. Flynn is not assertive. He has failed to inspire confidence.

H6: Antagonism within the department has caused the formal and informal communications networks to breakdown. This has caused all work to lag behind schedule.

Although you are continually generating new hypotheses, even as you evaluate the one's you have elaborated above, you know that it is now time to make a decision about what to do tc end the crisis in the accounting department. You have scheduled a meeting with Mr. Flynn for tomorrow morning.

(This case is a modified version of a case in Murray and Von der Embse's case book Organizaticnal Behavior: Critical Incidents and Analysis, 1973.)

APPENDIX 8

DECAID STUDENT MANUAL

Power / 1976

DECAID Student Manual

DECAID

DECAID is an evolving program. A developmental testing project is currently being conducted using DECAID and The White Implement Company critical incident. If you notice problems during execution of DECAID, please use the comment command and please save any hardcopy. Contact Daniel Power in Room PHBA for more information on DECAID or if you need special help call my home number 351-6145.

This student manual documents a computer aided learning (CAL) system named DECAID. DECAID is a mnemonic for the phrase DECision AID. DECAID was selected because it evckes a favorable image for the system: DECAID is a decision aid not a decision maker. Although DECAID is an evolving system, it is currently offered as a teaching instrument in the substantive area of decision making and inference behavior.

DECAID is an interactive, conversational decision system. DECAID is designed to: 1) ask questions about an organizational decision situation; and 2) structure the decision making process to conform with appropriate normative decision models.

Major Objectives of the DECAID Project

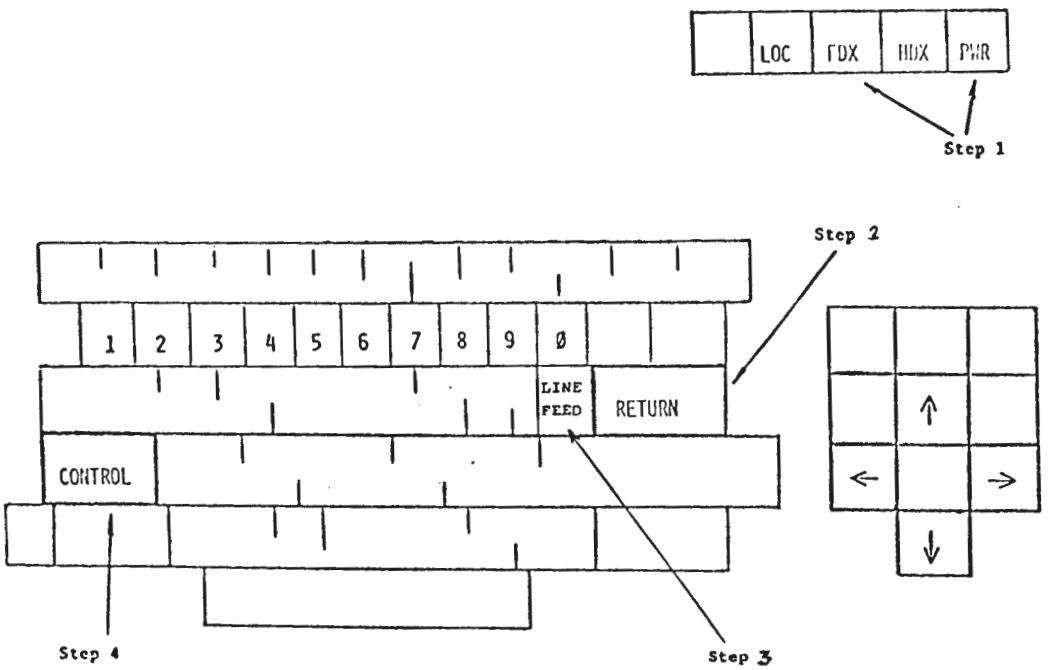
The DECAID project has three major objectives: to help you improve your decision making and inference behavior; to help you understand the decision making process and gain a decision process perspective; and to help you develop a better understanding of how decisions are actually made and perhaps a better understanding of how they should be made.

When Should You Use DECAID?

1. When the stakes in the outcome of the decision or the solution to the problem are high. (Matters affecting basic company policy; resource investments; strategy considerations in marketing, pricing and advertising; high risk investments in which many unknowns are involved; selection of key officers; and matters of capital financing and capital investments.)

2. If you are dissatisfied with the general level of company decision-making quality and desire to train and develop subordinates in the techniques of problem solving and decision making.

3. As a spot check test to insure that previously established standards for problem solving and decision making have not deteriorated over time.



Beehive Display Screen Terminal

How To Use DECAID

Step 1. Set the terminal switches. Press the PWR switch and then press the FDX switch.

Step 2. Press the RETURN key.

Step 3. Press the LINE FEED key.

The computer should respond by typing the following message:

PLEASE LOG IN

Step 4. Enter the HELLO command and use the CONTROL key to type the controlled characters in the password.

HELLO COMMAND. The HELLO command is used to log onto the system. The command is followed by an account number and password. The password is often protected by what are called control characters.

HELLO-Y103,BVWVB VWVB are control characters

Control characters are entered by holding the Control key down and then pressing the associated character.

ERRORS DURING LOGGING ON. If you make a mistake when logging on, the system responds with an appropriate error message. For example, if you forget to type the hyphen while entering the HELLO command:

HELLOY104,BGVVG

the system responds with the message:

ILLEGAL FORMAT

Re-enter the command in the correct form.

If the wrong password is entered:

HELLO-H200,JHN,1

the system responds:

ILLEGAL ACCESS

Re-enter the command with the correct password.

The messages ILLEGAL ACCESS and ILLEGAL FORMAT indicate that some or all of the current input is not acceptable to the system.

RUNNING DECAID. Once you have logged on to the HP System, you can gain access to DECAID by following these steps;

1. Type NO to the question UPPER CASE ONLY?

UPPER CASE ONLY?NO (Your responses are underlined.)

2. Type your ID number and first name in response to the question Please type your ID number and first name:

Please type your ID number and first name: 1000,GERALD

3. The computer responds with IS YOUR LAST NAME-----? to which you should reply YES if it is your name. If it is not your last name, you should reply NO and you will be asked to enter your ID number and first name again

Is your last name ROSE?yes

4. The daily message (if any) appears next, followed by the question COURSE NAME? You should type DECAID.

COURSE NAME?DECAID

5. The computer system will then print the date, time, and the terminal port number and proceed to DECAID.

CORRECTING TYPING ERRORS. Spelling mistakes, format errors and incorrect parameters can be corrected while your response is being entered if the error is noticed before the RETURN key is pressed. The control-H character can be used to correct a few characters just typed, or the control-X character can be used to cancel the entire line and start over. Control-H or control-X is entered by holding down the control key and typing H. Suppose that the word

"motivation" is misspelled as "motivatiob" during entry. The control-H will delete the last character. You can then retype "n" and finish the line. When you press return, the line is entered correctly.

If several characters have been typed after the error, the control-H character must be typed for each character to be deleted.

Another method to be used is to use control-X to cancel the entire line. The correct information can be entered on a new line.

USING THE RETURN KEY. It is necessary to press the return key to enter information into the computer. When a DECAID question is preceded by text, the student program pauses to allow you time to read the text before the question is presented. If you finish reading the text and want the next question displayed, press the RETURN key.

STOPPING DECAID. If you wish to stop the DECAID program type //STOP in response to any question and then press the RETURN key.

EXAMPLE. In the following example a user named Gerald Rose signs in. This example demonstrates the use of 3 DECAID commands://HINT;//COMMENT; and//STOP.

PLEASE LOG IN
hello-Y103, BVWVB VWVB are control characters
LAST BACKUP WAS THE 4TH OF JULY AT 1:00 P.M.

PORT #7 U OF I CAI LAB 12:13 P.M. TUE JUL 6
Upper case only?no

(YOUR RESPONSES ARE UNDERLINED)

Please type your ID number and first name: 1000,GERALD

Is your last name ROSE?yes

Course name?DECAID

6 July 1976 12:13 Port 7

D E C A I D

WELCOME,GERALD.

DECAID IS A DECISION AID SYSTEM.

YOU WILL RESPOND TO DECAID QUESTIONS AND DECAID WILL COMMENT ON YOUR ANSWERS AND INSTRUCT YOU IN THE FUNDAMENTALS OF THE DECISION MAKING PROCESS.

P R E S I D E N T S -- A DECAID example of the HINT, COMMENT, and STOP commands.

1. Who was the second president of the United States?
//HINT
It was not John Quincey Adams.
John Adams
CORRECT

2. Who was the third president of the United States?
//COMMENT That last hint was dumb!
Thomas Jefferson

3. Who was the fourth president of the United States?
//STOP

Please type your ID number and first name: //stop

DONE
bye
0004 MINUTES OF TERMINAL TIME

Options Available to DECAID Users

Exit and Reentry

To exit from DECAID before you complete a normal sequence you should type //STOP. This command returns you to the sign-in procedure. When you again sign in to DECAID, you resume at the point where you interrupted the program sequence.

You type	Result
//STOP	You are released from DECAID and returned to the sign-in.

Comment and Receive Assistance

//COMMENT	Anything you type after the entry //COMMENT is stored in the DECAID response file.
//HINT	DECAID supplies some hints. A hint helps you understand a concept or question. If no hint is available, the NOT AVAILABLE message is printed.

APPENDIX 9

MAJOR BEHAVIORAL OBJECTIVES OF DECAID

Major Behavioral Objectives of DECAID

1. To be able to list all of the steps in DECAID's decision making process model.

2. To be able to list examples of programmable decisions.

3. To be able to list questions that would help someone make an ill-defined or nonroutine decision.

4. To be able to define the concept "error of the third kind."

5. To be able to define the concept premature closure.

6. To identify steps in the decision process where premature closure may effect the results of the decision process.

7. To state that a decision maker must often make decisions with imperfect information.

8. To associate costs with obtaining additional information.

9. To be able to describe the multiple dimension that a decision maker must evaluate at each step in the decision making process.

10. To state the importance of specifying relevant organizational, personal and societal goals as part of the decision making process.

11. To state the sequential dependency between specifying goals and evaluating alternatives in DECAID's normative decision making process model.

12. To state that generating alternatives often involves creative, divergent efforts.

13. To state that the set of alternatives that a decision maker evaluates is but a subset of the feasible set of alternatives.

14. To state behavioral dimensions that should be evaluated when making some ill-defined behavior.

15. To list cultural, family and organizational influences on a manager's decision making behavior.

16. To state that most decision makers eventually evaluate what they consider to be the two "best" alternatives using a pro-con decision criteria to make a final choice.

17. To state that the final choice process in most decision situations is conducted to reaffirm a choice that was made earlier in the process.

18. To list questions that should be asked when a decision maker reviews or audits a decision making process.

APPENDIX 10

PERFORMANCE RESULTS FOR DEVELOPMENTAL TESTING GROUP 1

Results on the Performance Measures
for Developmental Testing Group 1

Subject	Completion Time	Pre-test Score	Post-test Score
1	70	5	6
2	118	10	12
3	99	7	10
4	-	9	13
5	-	4	5
6	75	5	9
7	57	5	4
8	75	7	10
9	79	6	7
10	-	4	9
11	64	3	11
12	-	6	6
13	55	5	4
14	-	6	4
15	71	7	13
16	65	5	7
17	70	4	4
18	84	7	13
19	73	3	4
	Mean = 75.35 minutes	Mean = 5.68 SD = 1.86	Mean = 7.95 SD = 3.4

- missing data

APPENDIX 11

PERFORMANCE RESULTS FOR DEVELOPMENTAL TESTING GROUP - 3

Performance Measure Results -
Developmental Testing Group 3

Treatment group (n = 9)

Subject	Pretest Score	Post-test Score
1	5	11
2	2	5
3	5	5
4	4	6
5	5	6
6	6	9
7	7	6
8	1	11
9	3	3
	Mean = 4.22 SD = 1.92	Mean = 6.89 SD = 2.80

Control group (n = 8)

Subject	Pretest Score	Post-test Score
10	4	7
11	5	6
12	3	4
13	3	5
14	4	4
15	5	4
16	4	5
17	4	2
	Mean = 4.0 SD = 0.75	Mean = 4.62 SD = 1.5

APPENDIX 12

ITEM MEANS - STUDENT ATTITUDE TOWARD DECAID AND CAL

Item Means*

STUDENT ATTITUDE TOWARD DECAID AND CAL
(Short Form)

Developed by Bobby R. Brown
Modified by Daniel Power and Bobby R. Brown

Questions	Developmental Testing Cycles** 1	2	3
1. While using DECAID I felt challenged to do my best work.	3.4	3.2	3.4
2. The material presented to me by Computer Aided Learning (CAL) caused me to feel that no one really cared whether I learned or not. (R)	3.8	4.0	3.5
3. The method by which I was told DECAID's opinion of my responses became monotonous. (R)	3.4	2.8	3.0
4. While using DECAID I felt isolated and alone.	3.6	4.5	3.1
5. DECAID's responses to my answers seemed appropriate. (R)	3.7	3.2	3.3
6. I felt uncertain as to my performance in the programmed course relative to the performance of others.	2.7	2.8	2.4
7. I found myself just trying to get through the material rather than trying to learn.	3.1	3.3	3.2
8. I guessed at what some of the questions meant.	3.1	2.8	2.8
9. I was encouraged by the responses given to my replies.	3.3	2.7	2.7
10. As a result of having studied some material by Computer Aided Learning I want to find out more about the subject matter.	3.6	3.5	3.3
11. In view of the time allowed for learning, I felt too much material was presented.	3.8	3.8	3.6
12. I was more involved in running the machine than in understanding the material.	3.8	3.8	3.8

Developmental Testing Cycles (cont'd)		1	2	3
13.	I felt I could work at my own pace.	3.4	3.5	3.6
14.	I felt as if I had a private tutor while on DECAID.	3.4	2.6	3.1
15.	I was aware of efforts to suit the material specifically to me.	3.3	2.3	3.0
16.	The Computer Aided Learning situation made me feel quite tense. (R)	3.0	3.5	3.3
17.	Questions were asked which I felt were not relevant to the decision making process.	4.3	3.7	4.2
18.	DECAID is an inefficient use of the student's time. (R)	3.5	3.8	3.7
19.	I put in answers knowing they didn't make sense in order to see what DECAID would do.	4.1	3.8	3.8
20.	I was allowed to continue by DECAID but I still did not understand the questions at times.	3.2	3.2	3.1
21.	DECAID made it possible for me to learn quickly.	3.0	2.8	3.2
22.	I felt frustrated by DECAID. (R)	2.7	2.9	2.9
23.	I could have learned more if I hadn't felt pushed. (R)	3.2	3.3	3.1
24.	The Computer Aided Learning approach is inflexible.	3.2	3.1	2.6
25.	Even otherwise interesting material would be boring when presented by the Computer. (R)	3.9	4.2	3.8
26.	In view of the effort I put into it, I was satisfied with what I learned while using DECAID.	3.1	2.8	3.4
27.	In view of the amount I learned, I would say this exercise is superior to traditional instruction.	2.9	2.5	3.0

28.	With a subject like decision making, I would prefer Computer Aided Learning to traditional lectures.	3.14	2.3	2.7
29.	I am not in favor of Computer Aided Learning because it is just another step toward de-personalization of learning. (R)	3.6	3.8	3.2
30.	I have had extensive training in decision making and inference behavior. (R)	4.4	4.3	4.2

---

*Note: These item means are merely indicative of the group's attitude. It is suggested that if the means are consistently low ($\bar{X} < 2.50$) or high ($\bar{X} > 3.50$) they indicate possible problems with or desirable features of DECAID perceived by users. Item means for the three cycles should not be compared statistically, but the standard deviations for all of the means reported in this summary table range from .6 to 1.2.

**Cycle 1 - Summer 1976 (n=21)
Cycle 2 - Fall 1976 (n=12)
Cycle 3 - Spring 1977 (n=10)

(R) scale was reversed for item analysis

APPENDIX 13

LISTING OF THE ORIGINAL DECAID PROGRAM

```
LESSON NAME =DECAD2          VERSION NUMBER 78


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  NO
TRIALS =   1
RESPONSE FILENAME=  NONE
STATISTICS FILENAME=  NONE
TIME =   90


SECTION #  1


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  DECAID SIGNED ON.
    2  &&&

QUESTION:
    3  ARE YOU A REGULAR USER OF DECAID?

CORRECT ANSWER GROUP
    4  #Y#
    5  #AFFIR
    6  #YES#

REPLY FOR THIS GROUP:
    7  WELCOME BACK!

CORRECT ANSWER GROUP
    8  #N#
    9  #NE
   10  #NO

REPLY FOR THIS GROUP:
   11  WELCOME TO DECAID -- THE DECISION AID PROGRAM.
   12  DECAID PROVIDES SOFTWARE SUPPORT FOR STRUCTURED
   13  DECISIONMAKING.  DECAID ATTEMPTS TO LEAD YOU IN A
   14  RATIONAL SEARCH AND SELECTION PROCESS.
   15  &&&
   16  AS YOU USE DECAID YOU MAY NEED ADDITIONAL INFORMATION ABOUT
   17  A DECAID QUESTION, IF SO TYPE //HINT.  YOU MAY FIND THAT ACCESS
   18  TO THE BASIC INTERPRETER OR TO A DESK CALCULATOR IS HELPFUL.
   19  TYPE //TSB TO TRANSFER TO THE BASIC INTERPRETER, THEN TYPE
   20  GET-$GOBACK WHEN YOU WISH TOU WISH T RETURN TO DECAID.
   21  $$BRANCH- 12
```

```
WRONG ANSWER GROUP:

   22  REGULAR
   23  WHAT
   24  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   25  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   26  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   27  &&&

REPLY FOR THIS GROUP:
   28  WHEN THIS QUESTION IS REDISPLAYED TYPE "NO".
   29  $$BRANCH- 1

REPLY TO UNEXPECTED ANSWER:
   30  WHEN THIS QUESTION IS REDISPLAYED TYPE "NO".
   31  $$BRANCH- 1

FAILURE MESSAGE:
   32  PLEASE SIGN OFF AND CONSULT THE DECISION AID MANUAL.
   33  TO SIGN OFF -- TYPE //STOP.
   34  $$BRANCH- 1


SECTION #  2


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  CATEGORIZE YOUR DECISION AS AN OPPORTUNITY OR AS A PROBLEM.
    4  &&&

CORRECT ANSWER GROUP
    5  #OPPOR
    6  #O#
    7  &&&

REPLY FOR THIS GROUP:
    8  NOW.  PLEASE FORMULATE A CONCISE DECISION QUESTION.
    9  &&&
   10  &&&

CORRECT ANSWER GROUP
   11  #P

REPLY FOR THIS GROUP:
   12  PLEASE CLARIFY AND STRUCTURE YOUR DECISION PROBLEM.
   13  &&&
   14  ATTEMPT TO FORMULATE A VERBALLY AND SEMANTICALLY
   15  SOUND DECISION QUESTION.
   16  $$BRANCH- 4
```

```
REPLY TO UNEXPECTED ANSWER:
   17  DAVIS SUGGESTS THAT "THE INTELLIGENCE PHASE OF THE
   18  DECISION-MAKING PROCESS IS OFTEN TERMED 'PROBLEM OR
   19  OPPORTUNITY RECOGNITION.'"  DA FIRST DETERMINES
   20  YOUR SUBJECTIVE RECOGNITION OF THE DECISION SITUATION
   21  AND THEN THROUGH BRANCHING DA ATTEMPTS TO CREATE
   22  A  VALID YET CONCISE PROBLEM STATEMENT.
   23  $$BRANCH- 2

FAILURE MESSAGE:
   24  PLEASE SIGN OFF DA.  REFLECT.  SIGN ON AGAIN.
   25  $$BRANCH- 91


SECTION #  3


SECTION OPTIONS:
       KEYWORD

QUESTION:
    1  CAN YOU FORMULATE YOUR PERCEIVED OPPORTUNITY AS A DECISION
    2  QUESTION?  IF SO, PLEASE ENTER YOUR DECISION
    3  QUESTION.  DECAID SUGGESTS THAT YOUR ENTRY BEGIN WITH
    4  THE WORD "SHOULD".

CORRECT ANSWER GROUP
    5  #EXPAN
    6  #INCREAS
    7  #REDUC

REPLY FOR THIS GROUP:
    8  ANALYSIS OF YOUR ENTRY SUGGESTS THAT YOU HAVE AN
    9  OPPORTUNITY FOR PROFIT.
   10  $$BRANCH- 5

CORRECT ANSWER GROUP
   11  #MINIMIZ
   12  #DIVERS
   13  #PROTECT
   14  #INFLUEN
   15  #MAINT
   16  #INSUR
   17  #HEDG

REPLY FOR THIS GROUP:
   18  ANALYSIS OF YOUR ENTRY SUGGESTS THAT YOU HAVE AN
   19  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   20  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   21  $$BRANCH- 5

CORRECT ANSWER GROUP
   22  #IMPROV
   23  #REDUC
   24  #DELETER
   25  #HARM
   26  #SOCIET

REPLY FOR THIS GROUP:
   27  ANALYSIS OF YOUR ENTRY SUGGESTS THAT YOU HAVE AN
   28  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   29  $$BRANCH- 5
```

```
REPLY TO UNEXPECTED ANSWER:
   30  PLEASE REFORMULATE YOUR OPPORTUNITY STATEMENT.
   31  SEMANTIC CLARITY IS NESSARY TO CORRECTLY DEFINE
   32  A DECISION QUESTION.
   33  $$BRANCH- 3

FAILURE MESSAGE:
   34  $$BRANCH- 91


SECTION #  4


SECTION OPTIONS:
       KEYWORD

QUESTION:
    1  CAN YOU NOW FORMULATE YOUR DECISION QUESTION
    2  IN A CONCISE, LOGICAL FORMAT?  IF SO, PLEASE
    3  ENTER YOUR PROBLEM STATEMENT.  DECAID SUGGESTS THAT YOUR ENTRY
    4  BEGIN WITH THE WORD "SHOULD".

CORRECT ANSWER GROUP
    5  #NEW
    6  #IMPROV
    7  #INCREAS
    8  #REDUC
    9  #CHANG
   10  #NEED

REPLY FOR THIS GROUP:
   11  AN ANALYSIS OF YOUR PROBLEM STATEMENT SUGGESTS
   12  THAT YOUR CURRENT PROBLEM IS AFFECTING DEMAND.
   13  &&&
   14  &&&

CORRECT ANSWER GROUP
   15  #DETERIO
   16  #INADEQUAT
   17  #ERRON
   18  #ERRO
   19  #INCORREC
   20  #ABSENTE
   21  #DECLIN
   22  #MISTAK
   23  #FOUL
   24  #INSUFFIC

REPLY FOR THIS GROUP:
   25  ANALYSIS INDICATES THAT YOU PROBLEM IS AFFECTING
   26  PERFORMANCE.

CORRECT ANSWER GROUP
   27  #INTERR
   28  #FAIL
   29  #LOSS
   30  #STOP
   31  #HALT
   32  #BLOCK
   33  #KINK
   34  BOTTLENECK
   35  #LAT
   36  #INCOMPL
```

```
REPLY FOR THIS GROUP:
   37  ANALYSIS INDICATES THAT RISK IS DIRECTLY
   38  INVOLVED IN THIS DECISION SITUATION.  FURTHER
   39  ANALYSIS SHOULD EVALUATE THE RISK YOUR PROBLEM
   40  CREATES.


WRONG ANSWER GROUP:

   41  #NE
   42  #NO#
   43  #N#
   44  #NE

REPLY FOR THIS GROUP:
   45  CONTINUE WORKING. I WILL REDISPLAY THIS
   46  QUESTION.
   47  $$BRANCH- 4

REPLY TO UNEXPECTED ANSWER:
   48  PLEASE REFORMULATE YOUR PROBLEM STATEMENT.
   49  SEMANTIC CLARITY IS IMPORTANT IN CORRECTLY
   50  DEFINING A DECISION QUESTION.
   51  $$BRANCH- 4

FAILURE MESSAGE:
   52  $$BRANCH- 91


SECTION #  5


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  DECAID ANALYSIS RELIES ON BOTH KEYWORD SEARCH AND
    2  CONDITIONAL BRANCHING.  LOGICAL INCOMPLETENESS CAN OCCUR.

QUESTION:
    3  DO YOU AGREE WITH DECAID'S ANALYSIS OF YOUR DECISION
    4  SITUATION.

CORRECT ANSWER GROUP
    5  YES
    6  Y

REPLY FOR THIS GROUP:
    7  GOOD.  REVIEW YOUR DECISION QUESTION.  REEVALUATE
    8  THE SCOPE AND IMPORTANCE OF THE QUESTION.

CORRECT ANSWER GROUP
    9  NO
   10  N
   11  NOT

REPLY FOR THIS GROUP:
   12  PLEASE ANALYZE BOTH THE STRUCTURE OF YOUR
   13  DECISION QUESTION AND THE CONTENT OF THE
   14  QUESTION.
   15  $$BRANCH- 2
```

```
CORRECT ANSWER GROUP
   16  MAYBE
   17  ALMOST
   18  PROBABLY
   19  LIKELY

REPLY FOR THIS GROUP:
   20  YOUR DECISION QUESTION SHOULD BE CLARIFIED.
   21  REFLECT THEN PLEASE REWRITE YOUR QUESTION.
   22  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   23  A DECISION QUESTION IS NOT EASY TO FORMULATE
   24  AND ANALYSIS BY DA IS A GRADUAL REFINING PROCESS.
   25  YOU MAY ATTEMPT TO CONTINUE FORMULATING A DECISION
   26  QUESTION OR YOU MAY DISCONTINUE THE DA PROGRAM.
   27  TO SIGN OFF DA TYPE //STOP
   28  $$BRANCH- 2

FAILURE MESSAGE:
   29  $$BRANCH- 91


SECTION #  6


SECTION OPTIONS:
       KEYWORD

QUESTION:
    1  COULD YOU CATEGORIZE THIS DECISION AS ROUTINE OR RECURRING?

CORRECT ANSWER GROUP
    2  #YES#
    3  #AFFIRM
    4  #Y#
    5  #POSIT

REPLY FOR THIS GROUP:
    6  REVIEW ALL APPLICABLE DECISIONS AND THEIR OUTCOMES.

CORRECT ANSWER GROUP
    7  MAYBE
    8  #POSS
    9  #PROB

REPLY FOR THIS GROUP:
   10  ATTEMPT TO LIST AND GENERALIZE SIMILAR PAST DECISION SITUATIONS.

CORRECT ANSWER GROUP
   11  NO
   12  #NO
   13  #N#

REPLY FOR THIS GROUP:
   14  $$BRANCH- 8

REPLY TO UNEXPECTED ANSWER:
   15  YOU APPARENTLY MISUNDERSTOOD THE QUESTION OR YOUR
   16  ANSWER WAS NOT RECOGNIZED.
   17  $$BRANCH- 6
```

```
FAILURE MESSAGE:
   18  INPUT NOT RECOGNIZED.
   19  $$BRANCH- 91

HINT # 1
   20  THE DECISION LITERATURE SUGGESTS TWO DECISION SITUATIONS
   21  WHICH ARE VARIOUSLY CALLED PROGRAMMABLE AND WICKED OR
   22. ROUTINE AND NONROUTINE.  THIS QUESTION HELPS YOU RECOGNIZE
   23  THE DISTINCTION AND ITS IMPLICATIONS.

HINT # 2
   24  &&&&
   25  &&&
   26  &&&


SECTION #  7


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  ASSUMING THEN THAT THIS DECISION QUESTION IS
    4  A FAIRLY ROUTINE OCCURANCE -- ARE APPROPRIATE
    5  DECISION CRITERIA ESSENTIALLY DEFINED?

CORRECT ANSWER GROUP
    6  #Y#
    7  #YES#
    8  #AFFIR
    9  #POS

REPLY FOR THIS GROUP:
   10  &&&
   11  &&&
   12  $$BRANCH- 9

CORRECT ANSWER GROUP
   13  #MAYBE
   14  #POSSIB

REPLY FOR THIS GROUP:
   15  ATTEMPT TO CLARIFY DECISION CRITERIA.
   16  $$BRANCH- 9

CORRECT ANSWER GROUP
   17  #N#
   18  #NE
   19  #NO

REPLY FOR THIS GROUP:
   20  ATTEMPT TO DEFINE A SET OF DECISION CRITERIA.
   21  $$BRANCH- 9
```

```
WRONG ANSWER GROUP:

   22  &&&
   23  &&&

REPLY FOR THIS GROUP:
   24  &&&

REPLY TO UNEXPECTED ANSWER:
   25  &&&
   26  $$BRANCH- 6

FAILURE MESSAGE:
   27  TRY AGAIN TOMMORROW.
   28  $$BRANCH- 91

HINT # 1
   29  &&&
   30  &&&

HINT # 2
   31  &&&
   32  &&&
   33  &&&


SECTION #  8


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  CAUTION!

QUESTION:
    2  HAVE ANALOGOUS DECISION SITUATIONS AND
    3  SIMILAR DECISION QUESTIONS OCCURRED?
    4  &&&
    5  &&&

CORRECT ANSWER GROUP
    6  #Y#
    7  #YES#
    8  #AFFIR
    9  #POSSIT

REPLY FOR THIS GROUP:
   10  ATTEMPT TO GENERALIZE FROM THAT ANALOGOUS SITUATION.
   11  CARE MUST BE EXERCISED AT THIS POINT.

CORRECT ANSWER GROUP
   12  #N#
   13  #NO
   14  #NE

REPLY FOR THIS GROUP:
   15  ASSUME THAT YOUR DECISION QUESTION IN NOT PROGRAMMABLE.
   16  $$BRANCH- 10
```

```
WRONG ANSWER GROUP:

   17  &&&
   18  &&&

REPLY FOR THIS GROUP:
   19  &&&
   20  $$BRANCH- 9


WRONG ANSWER GROUP:

   21  &&&
   22  &&&
   23  &&&

REPLY FOR THIS GROUP:
   24  &&&
   25  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
   26  WELL LET'S GO BACK.  WE WANT TO DETERMINE IF
   27  YOUR DECISION PROBLEM IS PROGRAMMABLE.
   28  $$BRANCH- 6

FAILURE MESSAGE:
   29  WELL THAT'S ALL FOR TODAY.
   30  $$BRANCH- 91

HINT # 1
   31  &&&
   32  &&&

HINT # 2
   33  &&&
   34  &&&
   35  &&&


SECTION #  9


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  ASSUME THAT YOUR DECISION PROBLEM IS PROGRAMMABLE.

QUESTION:
    2  &&&
    3  DO DECISION RULES OR MODELS CURRENTLY EXIST WHICH
    4  CAN BE APPLIED TO SOLVE THIS DECISION QUESTION?

CORRECT ANSWER GROUP
    5  #Y#
    6  #YES#
    7  #POSSIT
    8  #AFFIR

REPLY FOR THIS GROUP:
    9  APPLY THE APPRORIATE DECISION RULES OR MODELS IF
   10  PAST PERFORMANCE IS SATISFACTORY. REVISION MAY BE NECCESSARY.
   11  $$BRANCH- 91
```

```
CORRECT ANSWER GROUP
   12  MAYBE
   13  DO
   14  KNOW

REPLY FOR THIS GROUP:
   15  PLEASE CONSULT THE PROGRAM LIBRARY.
   16  $$BRANCH- 9

CORRECT ANSWER GROUP
   17  $N$
   18  $NO
   19  $NE

REPLY FOR THIS GROUP:
   20  YOU SHOULD CONSULT THE OPERATIONS RESEARCH DEPARTMENT
   21  OR YOU SHOULD ATTEMPT TO CREATE YOUR OWN DECISION MODEL.
   22  $$BRANCH- 91


WRONG ANSWER GROUP:

   23  &&&
   24  &&&

REPLY FOR THIS GROUP:
   25  &&&
   26  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
   27  DECAID WILL LOOP BACKWARD.
   28  $$BRANCH- 6

FAILURE MESSAGE:
   29  READ THE DECAID MANUAL.  SIGN ON AGAIN.
   30  $$BRANCH- 91

HINT # 1
   31  &&&
   32  &&&

HINT # 2
   33  &&&
   34  &&&
   35  &&&


SECTION #  10


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&
    3  &&&

QUESTION:
    4  HAVE YOU IDENTIFIED ANY SECONDARY DECISION QUESTIONS?
```

```
CORRECT ANSWER GROUP
    5  #Y#
    6  #YES#
    7  #POSI
    8  #AFFIR

REPLY FOR THIS GROUP:
    9  AFTER ANALYZING THE MAJOR DECISION QUESTION WHICH YOU HAVE
   10  ALREADY SPECIFIED YOU MAY WISH TO INVESTIGATE THESE
   11  SECONDARY QUESTIONS.

CORRECT ANSWER GROUP
   12  #N#
   13  #NO
   14  #NE

REPLY FOR THIS GROUP:
   15  AS YOU PROCEED WITH YOUR ANALYSIS OF THE DECISION QUESTION
   16  WHICH YOU HAVE ENTERED YOU MAY DETERMINE SECONDARY QUESTION
   17  WHICH ARE LINKED WITH THE CURRENT DECISION QUESTION.
   18  IF YOU DISCOVER SUCH SECONDARY QUESTIONS YOU MAY WISH TO
   19  USE DA TO HELP YOU ANALYZE THEM.


WRONG ANSWER GROUP:

   20  MAYBE
   21  &&&
   22  &&&
   23  &&&
   24  &&&

REPLY FOR THIS GROUP:
   25  GIVE THIS QUESTION MORE THOUGHT YOU MAY BE ABLE
   26  TO MAKE A CATEGORICAL YES OR NO STATEMENT.

REPLY TO UNEXPECTED ANSWER:
   27  GIVE THIS QUESTION MORE THOUGHT YOU MAY BE ABLE
   28  TO MAKE A CATEGORICAL YES OR NO STATEMENT.

FAILURE MESSAGE:
   29  TRY AGAIN -- IF YOU GET STUCK HERE TYPE //STOP
   30  $$BRANCH- 10

HINT # 1
   31  A SECONDARY QUESTION IS
   32  &&&
   33  &&&
   34  &&&

HINT # 2
   35  &&&


SECTION #  11


SECTION OPTIONS:
       KEYWORD
```

```
TEXT:
    1  &&&
    2  &&&
    3  &&&
    4  &&&
    5  &&&

QUESTION:
    6  HAVE YOU DETERMINED WHAT OBJECTIVES OR STANDARDS SHOULD
    7  BE USED TO EVALUATE THE QUALITY OF YOUR DECISION?

CORRECT ANSWER GROUP
    8  #Y#
    9  #YES#
   10  #POS
   11  #AFFIRM

REPLY FOR THIS GROUP:
   12  &&&
   13  $$BRANCH- 17

CORRECT ANSWER GROUP
   14  #N#
   15  #NO
   16  #NE

REPLY FOR THIS GROUP:
   17  CLEARLY DEFINED OBJECTIVES ARE IMPORTANT IN DECISION
   18  MAKING.  EVERY PERSON, GROUP, ORGANIZATION AND SOCIAL
   19  AGGLOMERATION HAS MANY OBJECTIVES.  LET'S DETERMINE
   20  $$BRANCH- 14


WRONG ANSWER GROUP:

   21  MAYBE
   22  DON'T
   23  CARE

REPLY FOR THIS GROUP:
   24  STOP NOW AND THINK ABOUT YOUR OBJECTIVES AND
   25  OTHER OBJECTIVES THAT ARE ENVIRONMENTALLY
   26  DICTATED.
   27  $$BRANCH- 91


WRONG ANSWER GROUP:

   28  &&&
   29  &&&

REPLY FOR THIS GROUP:
   30  &&&
   31  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   32  TYPE HINT. ANSWER THE QUESTION AGAIN.
   33  IF YOU GET CAUGHT IN A LOOP HERE TYPE
```

```
SECTION #  12


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  HAVE YOU IDENTIFIED THE PARAMETERS OF YOUR DECISION
    4  SITUATION?

CORRECT ANSWER GROUP
    5  #Y#
    6  #YES#
    7  #POSIT
    8  #AFFIR

REPLY FOR THIS GROUP:
    9  GOOD.  AWARENESS OF A DECISION SITUATION IS A
   10  PREREQUISITE.

CORRECT ANSWER GROUP
   11  REASONABLE
   12  CERTAINLY

REPLY FOR THIS GROUP:
   13  GOOD.  DECAID MAY BE ABLE TO HELP IF YOUR
   14  DECISION SITUATION IS BOTH WICKED AND SIGNIFICANT.
   15  $$BRANCH- 2


WRONG ANSWER GROUP:

   16  #N#
   17  #NO#
   18  #NO
   19  NO

REPLY FOR THIS GROUP:
   20  DECAID CAN NOT HELP UNLESS YOU ARE AWARE OF A DECISION SITUATION.
   21  TYPE //HINT
   22  $$BRANCH- 12


WRONG ANSWER GROUP:

   23  MAYBE
   24  #POSS
   25  #POSSIBLY
   26  #POSSIB

REPLY FOR THIS GROUP:
   27  YOU MUST BE CERTAIN THAT A DECISION SITUATION EXISTS.
   28  $$BRANCH- 12
```

```
REPLY TO UNEXPECTED ANSWER:
   29  YOUR RESPONSE IS UNEXPECTED.  TRY AGAIN.
   30  $$BRANCH- 12

FAILURE MESSAGE:
   31  READ THE DECAID MANUAL
   32  $$BRANCH- 12

HINT # 1
   33  &&&
   34  &&&

HINT # 2
   35  &&&
   36  &&&


SECTION #  13


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  HOW IMPORTANT AND SIGNIFICANT IS YOUR DECISION SITUATION?

CORRECT ANSWER GROUP
    3  VERY
    4  EXTREMELY
    5  GREATLY
    6  STRIKINGLY

REPLY FOR THIS GROUP:
    7  PROCEED LOGICALLY. SEARCH ALTERNATIVES. EVALUATE UNCERTAINTIES.
    8  $$BRANCH- 2

CORRECT ANSWER GROUP
    9  MODERATELY
   10  SOME
   11  GENERALLY
   12  QUITE
   13  LARGELY

REPLY FOR THIS GROUP:
   14  CONTINUE.
   15  $$BRANCH- 2


WRONG ANSWER GROUP:

   16  #NO

REPLY FOR THIS GROUP:
   17  YOU PROBABLY DON'T NEED ASSISTANCE
   18  $$BRANCH- 91
```

```
REPLY TO UNEXPECTED ANSWER:
   19  YOU PROBABLY DON'T NEED HELP MAKING A DECISION.
   20  $$BRANCH- 91

FAILURE MESSAGE:
   21  $$BRANCH- 91

HINT # 1
   22  $$$
   23  $$$


DESTINATION FILENAME= QUEST

COMMAND? //STOP
```

APPENDIX 14

LISTINGS OF THE DECAID PROGRAMS

Listings of the DECAID Programs

The DECAID programs are listed in the following order on succeeding pages. DECAID contains both instructional Dialogue Facility (I) programs and BASIC (B) programs.

Program Name	Program Type
ALTENT	B
ALTG3	B
ALTGEN	I
AUDIT	B
BEHAVE	B
CHOICE	B
DECAID	I
DECGO2	B
DECGOL	I
DECINF	I
DEFIN2	B
GUIDE	B
IDEAS	B
INTRO1	B
INTRO2	B
PROBSL	B
QUEST3	B
REMEM	I
QUEST	I
ROUTIN	I
WHY1	B

ALTENT

```
10  DIM A$[160]
20  DIM B$[160]
30  DIM C$[160]
40  DIM D$[160]
50  DIM E$[160]
60  DIM F$[160]
70  PRINT "PLEASE ENTER YOUR ALTERNATIVES.  HOW MANY"
80  PRINT "ALTERNATIVES DO YOU PLAN TO ENTER?"
90  INPUT A
100  IF A>6 THEN 600
110  PRINT "PLEASE RESTRICT YOUR INPUT TO LESS THAN 160 CHARACTERS iIN A STRING"
120  PRINT
130  PRINT "PLEASE ENTER ALTERNATIVE   1"
140  ENTER 100,A0,A$
150  IF A=1 THEN 420
160  PRINT
170  PRINT "PLEASE ENTER ALTERNATIVE 2"
180  ENTER 100,A0,B$
190  IF A=2 THEN 420
200  PRINT
210  PRINT "PLEASE ENTER ALTERNATIVE 3"
220  ENTER 100,A0,C$
230  IF A=3 THEN 420
240  PRINT
250  PRINT "PLEASE ENTER ALTERNATIVE 4"
260  ENTER 100,A0,D$
270  IF A=4 THEN 420
280  PRINT
290  PRINT "PLEASE ENTER ALTERNATIVE 5"
300  ENTER 100,A0,E$
310  IF A=5 THEN 420
320  PRINT
330  PRINT "PLEASE ENTER ALTERNATIVE 6"
340  ENTER 100,A0,F$
350  GOTO 420
360  A$=UPS$(A$)
370  B$=UPS$(B$)
380  C$=UPS$(C$)
390  D$=UPS$(D$)
400  E$=UPS$(E$)
410  F$=UPS$(F$)
420  PRINT
430  PRINT '20'7
440  PRINT
450  PRINT A$
460  PRINT
470  PRINT B$
480  PRINT
490  PRINT C$
500  PRINT
510  PRINT D$
520  PRINT
530  PRINT E$
540  PRINT
550  PRINT F$
560  PRINT
570  PRINT
580  ENTER 60,A0,A1
590  CHAIN "*IDSF"
600  PRINT "YOU MAY ONLY ENTER SIX ALTERNATIVES AT ONE TIME."
610  GOTO 70
620  END
```

```
ALTG3

10  ENTER 6,A0,A1
20  PRINT '20'7
30  PRINT "A L T G E N"
40  PRINT
50  PRINT "YOU ARE ENTERING ALTGEN, THE ALTERNATIVE GENERATION"
60  PRINT "PHASE OF DECAID."
70  ENTER 6,A0,A1
80  PRINT "THE PROCESS OF DEVELOPING ALTERNATIVES FIRST INVOLVES"
90  PRINT "CREATIVITY AND THEN STRUCTURING . . . THE NUMBER AND"
100  PRINT "QUALITY OF ALTERNATIVES DEPENDS IN LARGE PART UPON"
110  PRINT "IMAGINATIVE HANDLING AND INTERPRETATION OF DATA."
120  PRINT "JOHN G. HUTCHINSON"
130  ENTER 10,A0,A1
140  PRINT '20'7
150  CHAIN "*IDSF"
160  END


LESSON NAME =ALTGEN          VERSION NUMBER 31


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  YES
TRIALS =   2
RESPONSE FILENAME=  ALTG1
STATISTICS FILENAME=  ALTG2
TIME =   180


SECTION #  1

TEXT:
    1  \\\\alts3,10
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  DO YOU HAVE ANY EXPECTATIONS ABOUT THE SOLUTION OF
    6  YOUR DECISION QUESTION?

CORRECT ANSWER GROUP
    7  YES
    8  Y
```

```
REPLY FOR THIS GROUP:
    9  IT IS A GOOD IDEA TO RECOGNIZE YOUR PREJUDICES AND BIASES
   10  ABOUT A SOLUTION BEFORE YOU BEGIN GENERATING ALTERNATIVES.
   11  WE ALL HAVE ALTERNATIVE GENERATORS.  YOUR SUBCONSCIOUS HAS
   12  BEEN GENERATING ALTERNATIVES --- NOW WE WILL MOLD AND
   13  STRUCTURE YOUR ALTERNATIVES.
   14  $$BRANCH- 2


WRONG ANSWER GROUP:

   15  NO
   16  N

REPLY FOR THIS GROUP:
   17  &&&
   18  $$BRANCH- 3

REPLY TO UNEXPECTED ANSWER:
   19  &&&
   20  $$BRANCH- 3

FAILURE MESSAGE:
   21  $$BRANCH- 3

HINT # 1
   22  &&&


SECTION #  2

TEXT:
    1  \\\\remem,10

QUESTION:
    2  WHAT DO YOU EXPECT YOUR DECISION WILL BE?

CORRECT ANSWER GROUP
    3  &&&

REPLY FOR THIS GROUP:
    4  &&&
    5  $$BRANCH- 7

REPLY TO UNEXPECTED ANSWER:
    6  $$BRANCH- 3

FAILURE MESSAGE:
    7  $$BRANCH- 7


SECTION #  3

QUESTION:
    1  HAVE YOU ATTEMPTED TO EVALUATE YOUR DECISION QUESTION
    2  FROM DIVERSE POINTS OF VIEW?

CORRECT ANSWER GROUP
    3  YES
    4  Y
```

```
REPLY FOR THIS GROUP:
    5  GOOD.  YOU DON'T WANT YOUR ANALYSIS TO BE NARROW AND ONE-SIDED.

WRONG ANSWER GROUP:

    6  NO
    7  N

REPLY FOR THIS GROUP:
    8  WHAT WOULD A PSYCHOLOGIST SUGGEST AS AN ALTERNATIVE?
    9  WHAT WOULD A SOCIOLOGIST SUGGEST?
   10  A PHYSICIST?
   11  A MATHEMATICIAN?
   12  $$BRANCH- 4

REPLY TO UNEXPECTED ANSWER:
   13  PLEASE ANSWER YES OR NO.

FAILURE MESSAGE:
   14  &&&

HINT # 1
   15  WHAT IS A POINT OF VIEW?
   16  &&&
   17  &&&


SECTION #  4

TEXT:
    1  &&&

QUESTION:
    2  CAN YOU LIST AVAILABLE ALTERNATIVES?

CORRECT ANSWER GROUP
    3  YES
    4  Y

REPLY FOR THIS GROUP:
    5  &&&


WRONG ANSWER GROUP:

    6  NO
    7  N

REPLY FOR THIS GROUP:
    8  ASK YOURSELF .... WHAT IS POSSIBLE?
    9  WHAT IF I ....?  WHY NOT ...?
   10  $$BRANCH- 4

REPLY TO UNEXPECTED ANSWER:
   11  &&&
   12  PLEASE ANSWER YES OR NO.

FAILURE MESSAGE:
   13  &&&
```

```
SECTION #  5

SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\altent,10
    2  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
    3  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

QUESTION:
    4  ARE YOUR ALTERNATIVES CORRECTLY ENTERED?

CORRECT ANSWER GROUP
    5  #Y

REPLY FOR THIS GROUP:
    6  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
    7  MAKE CERTAIN YOU HAVEN'T OVERLOOKED ANY POSSIBILITIES.
    8  $$BRANCH- 5

FAILURE MESSAGE:
    9  &&&
   10  $$BRANCH- 6


SECTION #  6

TEXT:
    1  ANALYSIS OF ALTERNATIVES

QUESTION:
    2  WHAT ALTERNATIVE ARE YOU ANALYZING?

CORRECT ANSWER GROUP
    3  &&&

REPLY FOR THIS GROUP:
    4  $$BRANCH- 7

REPLY TO UNEXPECTED ANSWER:
    5  $$BRANCH- 7

FAILURE MESSAGE:
    6  $$BRANCH- 7


SECTION #  7

QUESTION:
    1  WHAT WOULD HAPPEN IF YOUR DECISION WAS JUST THE
    2  OPPOSITE OF THE ALTERNATIVE YOU ARE ANALYZING?

CORRECT ANSWER GROUP
    3  NOTHING

REPLY FOR THIS GROUP:
    4  WELL ... THIS SEEMS LIKE A WEAK ALTERNATIVE.
```

```
WRONG ANSWER GROUP:

    5  1
    6  IDON'TKNOW

REPLY FOR THIS GROUP:
    7  $$BRANCH- 1


WRONG ANSWER GROUP:

    8  CATASTROPHE
    9  DISSASTER
   10  DISASTER
   11  &&&
   12  &&&

REPLY FOR THIS GROUP:
   13  $$BRANCH- 1

REPLY TO UNEXPECTED ANSWER:
   14  &&&
   15  $$BRANCH- 8

FAILURE MESSAGE:
   16  &&&


SECTION #  8

TEXT:
    1  \\\\BEHAVE,10


SECTION #  9


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  DO YOU WANT TO ANALYZE ANOTHER ALTERNATIVE?

CORRECT ANSWER GROUP
    3  #Y
    4  &&&

REPLY FOR THIS GROUP:
    5  OK.
    6  $$BRANCH- 6


WRONG ANSWER GROUP:

    7  #N
    8  &&&
```

```
REPLY FOR THIS GROUP:
    9  DECAID HOPES YOU HAVE CONSIDERED ALL OF YOUR ALTERNATIVES.
   10  $$BRANCH- 10

REPLY TO UNEXPECTED ANSWER:
   11  PLEASE TYPE YES OR NO.


SECTION #  10

QUESTION:
    1  WHAT WOULD HAPPEN IF YOU TOOK NO ACTION?
    2  &&&

CORRECT ANSWER GROUP
    3  &&&
    4  &&&


WRONG ANSWER GROUP:

    5  NOTHING

REPLY FOR THIS GROUP:
    6  $$BRANCH- 11


WRONG ANSWER GROUP:

    7  DISASTER
    8  &&&
    9  &&&

REPLY FOR THIS GROUP:
   10  $$BRANCH- 11

REPLY TO UNEXPECTED ANSWER:
   11  $$BRANCH- 11

FAILURE MESSAGE:
   12  &&&


SECTION #  11

TEXT:
    1  \\\\GUIDE,10


SECTION #  12

TEXT:
    1  \\\\CHOICE,10
    2  &&&
    3  &&&
```

```
SECTION #  13

TEXT:
    1  AT THIS POINT YOU SHOULD BE READY TO MAKE A DECISION.
    2  &&&
    3  &&&
    4  &&&&
    5  &&&

QUESTION:
    6  HAVE YOU MADE A DECISION?

CORRECT ANSWER GROUP
    7  YES
    8  Y
    9  &&&
   10  &&&

REPLY FOR THIS GROUP:
   11  OK.  AT THIS POINT YOU SHOULD PLAN AN IMPLEMENTATION
   12  STRATEGY.
   13  &&&


WRONG ANSWER GROUP:

   14  N
   15  NO
   16  &&&

REPLY FOR THIS GROUP:
   17  YOU ARE BEING RETURNED TO THE START OF ALTGEN.
   18  $$BRANCH- 1

REPLY TO UNEXPECTED ANSWER:
   19  PLEASE ANSWER YES OR NO.

HINT # 1
   20  DON'T WAIT IF YOU ARE CONFIDENT THAT YOU HAVE FOLLOWED
   21  A RATIONAL DECISION PROCESS.


SECTION #  14


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\AUDIT,10
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  ARE YOU READY TO SIGN OFF?

CORRECT ANSWER GROUP
    6  YES
    7  Y
```

```
REPLY FOR THIS GROUP:
    8  )))DECAID,19


WRONG ANSWER GROUP:

    9  NO
   10  N
   11  NEGATIVE

REPLY FOR THIS GROUP:
   12  OK. YOU ARE BEING BRANCHED TO AN IDENTIFICATION ROUTINE.
   13  )))DECAID,4

REPLY TO UNEXPECTED ANSWER:
   14  PLEASE TYPE YES OR NO.

NO BRANCHING SPECIFIED

AUDIT

10  PRINT
20  DIM B$[10]
30  ENTER 20,A1,A0
40  PRINT '20'7
50  PRINT "NOW THAT YOU HAVE MADE A DECISION YOU MAY WISH"
60  PRINT "TO AUDIT YOUR DECISION."
70  PRINT
80  PRINT "DO YOU WISH TO EXECUTE THE AUDIT ROUTINE?"
90  INPUT B$
100  B$=UPS$(B$)
110  IF B$[1,1]="Y" THEN 130
111  IF B$="//STOP" THEN 120
112  IF B$="//HINT" THEN 121
120  CHAIN "*IDSF"
121  PRINT "HINT IS NOT AVAILABLE."
130  PRINT
140  PRINT "A  U  D  I  T"
150  PRINT
155  PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN AUDIT."
156  PRINT
160  ENTER 10,A0,A1
170  PRINT '20'7
180  PRINT "1. IS YOUR DECISION FEASIBLE?"
190  ENTER 30,C,C$
200  PRINT
210  PRINT "2. WILL THE BENEFITS OF YOUR DECISION OFFSET THE COSTS?"
220  ENTER 30,C,C$
230  PRINT
240  PRINT "3. CAN THE ORGANIZATION COPE WITH THE CHANGES THAT WILL"
250  PRINT "RESULT FROM YOUR DECISION?"
260  ENTER 30,C,C$
270  PRINT
280  PRINT "4. ARE REQUIRED RESOURCES AVAILABLE?"
290  ENTER 30,C,C$
300  PRINT
310  PRINT "5. DOES PAST PERFORMANCE SUGGEST A SUCCESSFUL OUTCOME?"
320  ENTER 30,C,C$
330  PRINT
```

```
340  PRINT "6. IS THE DECISION COMPATIBLE WITH YOUR CAPACITY TO ASSUME"
350  PRINT "RISK?"
360  ENTER 30,C,C$
370  PRINT
380  PRINT "7. IS THE DECISION COMPATIBLE WITH YOUR WILLINGNESS TO ASSUME"
390  PRINT "RISK?"
400  ENTER 30,C,C$
410  PRINT
420  PRINT "8. ARE TARGETS,TIMETABLES,TECHNIQUES,MEETINGS OR WHATEVER IS"
430  PRINT "NEEDED TO IMPLEMENT YOUR DECISION DEFINED AND DOCUMENTED?"
440  ENTER 30,C,C$
450  PRINT
460  ENTER 15,A0,A1
470  PRINT '20'7
480  PRINT
490  PRINT "IF YOU ANSWERED IN THE AFFIRMATIVE FOR EACH QUESTION ABOVE"
500  PRINT "YOU CAN FEEL QUITE CONFIDENT THAT YOU HAVE MADE A 'GOOD' DECISION."
510  PRINT
520  PRINT "EACH TIME YOU ANSWERED IN THE NEGATIVE YOU IDENTIFIED A"
530  PRINT "WEAKNESS IN YOUR DECISION.  YOU MAY WANT TO USE SELECTED PHASES"
540  PRINT "OF DECAID TO ELIMINATE THE WEAKNESS."
550  PRINT
560  ENTER 15,A1,A0
570  CHAIN "*IDSF"
580  END
```

BEHAVE

```
10   DIM B$[10]
20   PRINT '20'7
30   PRINT "B E H A V E"
40   PRINT
50   ENTER 4,A0,A1
60   PRINT "WELCOME TO BEHAVE.  BEHAVE IS PART OF ALTEVA, THE ALTERNATIVE"
70   PRINT "EVALUATION PHASE OF DECAID.  IT ATTEMPTS TO HELP YOU ANALYZE"
80   PRINT "THE BEHAVIORAL ASPECTS OF YOUR DECISION ALTERNATIVES."
85   PRINT
86   PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN BEHAVE."
87   PRINT
88   PRINT "YOU MAY ENTER MULTIPLE LINES OF INPUT IN BEHAVE. STRIKE"
89   PRINT "THE RETURN KEY TWICE TO MOVE ON TO THE NEXT QUESTION."
90   PRINT
100  PRINT "WHAT ALTERNATIVE DO YOU WANT TO EVALUATE?"
110  ENTER 60,A0,A1
120  PRINT
130  PRINT
140  PRINT "WHAT WILL MEMBERS OF YOUR ORGANIZATION PERCEIVE AS THE"
150  PRINT "CONSEQUENCES OF THIS ALTERNATIVE?"
160  PRINT
170  ENTER 60,A0,A1
180  PRINT
190  ENTER 60,A0,A1
200  PRINT '18'18'18'18'18'11'7
210  PRINT "WHAT EFFECT WILL THIS ALTERNATIVE HAVE ON THE MOTIVATION"
220  PRINT "OF MEMBERS OF THE ORGANIZATION?"
230  PRINT
240  ENTER 60,A0,A1
250  PRINT
```

```
260  ENTER 60,A0,A1
270  PRINT "WHAT IMPACT WILL THIS ALTERNATIVE HAVE ON THE FORMAL AND"
280  PRINT "INFORMAL COMMUNICATION CHANNELS IN THE ORGANIZATION?"
290  PRINT
300  ENTER 60,A0,A1
310  PRINT
320  ENTER 60,A0,A1
330  PRINT '18'18'18'18'18'11'7
340  PRINT "WHOSE STATUS OR ROLE WILL BE EFFECTED IF THIS ALTERNATIVE IS"
350  PRINT "IMPLEMENTED?"
360  PRINT
370  ENTER 60,A0,A1
380  PRINT
390  ENTER 60,A0,A1
400  PRINT "DO YOU RUN TO RUN BEHAVE WITH A DIFFERENT ALTERNATIVE?"
410  INPUT B$
420  B$=UPS$(B$)
430  IF B$="Y" THEN 100
440  IF B$="YES" THEN 100
450  PRINT '18'18'18'18'18'11'7
460  CHAIN "*IDSF"
470  END
```

CHOICE

```
10   DIM J$[10]
20   DIM I$[10]
30   DIM G$[10]
40   REM STRING VARIABLES FOR ALTERNATIVE 1.
50   DIM A$[70],B$[70],C$[70]
60   REM STRING VARIABLES FOR ALTERNATIVE 2.
70   DIM D$[70],E$[70],F$[70]
80   REM STRING VARIABLES FOR PRO AND CON ALTERNATIVE 1.
90   DIM W$[255],X$[255]
100   REM STRING VARIABLES FOR PRO AND CON ALTERNATIVE 2.
110   DIM Y$[255],Z$[255]
120   J=0
130   ENTER 6,A0,A1
140   PRINT '20
150   PRINT '20'7
160   PRINT "C  H  O  I  C  E"
170   PRINT
180   PRINT "THIS ROUTINE INPUTS PRO AND CON ARGUMENTS RELEVANT"
190   PRINT "TO EACH OF YOUR REMAINING ALTERNATIVES.  THIS IS THE"
200   PRINT "CHOICE PHASE OF DECAID AND DECAID ASSUMES THAT YOU HAVE"
210   PRINT "NARROWED YOUR SEARCH FOR A DECISION TO TWO ALTERNATIVES."
220   PRINT
230   PRINT "ARE YOU READY TO EXECUTE CHOICE?"
240   INPUT G$
250   G$=UPS$(G$)
260   IF G$="N" THEN 2270
270   IF G$="NO" THEN 2270
280   PRINT
290   ENTER 4,A0,A1
300   PRINT '20
310   PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN CHOICE."
320   PRINT
```

```
330  PRINT '20'7
340  PRINT
350  PRINT "YOU ARE ENTERING CHOICE, THE CHOICE PHASE OF DECAID."
360  PRINT
370  PRINT
380  PRINT "WHAT IS YOUR FIRST ALTERNATIVE?"
390  PRINT
400  ENTER 255,A,A$
410  A$=UPS$(A$)
420  PRINT
430  ENTER 255,B,B$
440  B$=UPS$(B$)
450  IF B<4 THEN 490
460  PRINT
470  ENTER 255,C,C$
480  C$=UPS$(C$)
490  PRINT
500  J=1
510  PRINT
520  PRINT '20
530  PRINT "FIRST ALTERNATIVE"
540  PRINT A$
550  PRINT B$
560  PRINT C$
570  PRINT
580  PRINT  USING 590
590  IMAGE "WHAT ARGUMENTS SUPPORT ADOPTION OF THIS ALTERNATIVE?"
600  PRINT
610  FOR N=1 TO 15
620  PRINT
630  PRINT "PLEASE RESTRICT INPUT FOR PRO AND CON ARGUMENTS TO"
640  PRINT "15 CHARACTERS.  THIS IS NECESSARY FOR DISPLAY PURPOSES."
650  PRINT
660  PRINT '20'7
670  PRINT "ENTER PRO ARGUMENT #";N
680  PRINT
690  ENTER 255,W,W$[J,J+15]
700  W$=UPS$(W$)
710  PRINT
720  IF W<3 THEN 760
730  J=J+15
740  PRINT '18'18'18'11
750  NEXT N
760  K=1
770  PRINT
780  PRINT '20
790  PRINT "FIRST ALTERNATIVE"
800  PRINT A$
810  PRINT B$
820  PRINT C$
830  PRINT
840  PRINT  USING 850
850  IMAGE "WHAT ARGUMENTS OPPOSE ADOPTION OF THIS ALTERNATIVE?"
860  PRINT
870  FOR M=1 TO 15
880  PRINT
890  PRINT "ENTER CON ARGUMENT #";M
900  ENTER 255,X,X$[K,K+15]
910  X$=UPS$(X$)
```

```
920  PRINT
930  IF X<3 THEN 970
940  K=K+15
950  PRINT '18'18'18'11
960  NEXT M
970  PRINT
980  PRINT '20
990  PRINT "WHAT IS YOUR SECOND ALTERNATIVE?"
1000  PRINT
1010  ENTER 255,D,D$
1020  D$=UPS$(D$)
1030  PRINT
1040  ENTER 255,E,E$
1050  E$=UPS$(E$)
1060  IF E<4 THEN 1100
1070  PRINT
1080  ENTER 255,F,F$
1090  F$=UPS$(F$)
1100  PRINT
1110  L=1
1120  PRINT
1130  PRINT '20
1140  PRINT "SECOND ALTERNATIVE"
1150  PRINT D$
1160  PRINT E$
1170  PRINT F$
1180  PRINT
1190  PRINT  USING 590
1200  PRINT
1210  FOR O=1 TO 15
1220  PRINT
1230  PRINT "ENTER PRO ARGUMENT #";O
1240  PRINT
1250  ENTER 255,Y,Y$[L,L+15]
1260  Y$=UPS$(Y$)
1270  PRINT
1280  IF Y<3 THEN 1320
1290  L=L+15
1300  PRINT '18'18'18'11
1310  NEXT O
1320  L1=1
1330  PRINT
1340  PRINT '20'7
1350  PRINT "SECOND ALTERNATIVE"
1360  PRINT D$
1370  PRINT E$
1380  PRINT F$
1390  PRINT
1400  PRINT  USING 850
1410  PRINT
1420  FOR P=1 TO 15
1430  PRINT
1440  PRINT "ENTER CON ARGUMENT #";P
1450  PRINT
1460  ENTER 255,Z,Z$[L1,L1+15]
1470  Z$=UPS$(Z$)
1480  PRINT
1490  IF Z<3 THEN 1530
1500  L1=L1+15
1510  PRINT '18'18'18'11'7
1520  NEXT P
1530  PRINT
```

```
1540  PRINT '20
1550  PRINT "YOU HAVE FINISHED ENTERING YOUR ARGUMENTS.  DECAID"
1560  PRINT "WILL ATTEMPT TO PRESENT THE INFORMATION IN A FORM"
1570  PRINT "THAT HELPS YOU DEVELOP A RATIONALE FOR YOUR CHOICE."
1580  PRINT
1590  PRINT "ALTERNATIVE 1"
1600  PRINT
1610  PRINT A$
1620  PRINT B$
1630  PRINT C$
1640  PRINT
1650  PRINT "ALTERNATIVE 2"
1660  PRINT
1670  PRINT D$
1680  PRINT E$
1690  PRINT F$
1700  ENTER 45,A0,A1
1710  J1=1
1720  PRINT '20
1730  IMAGE "ALTERNATIVE 1",27X,"ALTERNATIVE 2"
1740  PRINT  USING 1730
1750  PRINT
1760  IMAGE 6X,"PRO",12X,"CON",20X,"PRO",12X,"CON"
1770  PRINT  USING 1760
1780  FOR I1=1 TO 15
1790  PRINT W$[J1,J1+14];SPA(1);X$[J1,J1+14];SPA(9);Y$[J1,J1+14];SPA(1);Z$[J1,J1+14]
1800  J1=J1+15
1810  IF LEN(W$)<J1 THEN 1830
1820  GOTO 1860
1830  IF LEN(X$)<J1 THEN 1850
1840  GOTO 1860
1850  IF LEN(Y$)<J1 THEN 1870
1860  NEXT I1
1870  IF LEN(Z$)<J1 THEN 1890
1880  GOTO 1860
1890  PRINT
1900  IF J=1 THEN 2190
1910  PRINT "*************************************************************************"
1920  PRINT
1930  PRINT "ANALYSIS 1"
1940  PRINT "BALANCE PRO AND CON ARGUMENTS FOR EACH ALTERNATIVE."
1950  PRINT
1960  PRINT "WHICH ALTERNATIVE HAS MORE SUPPORT AND LESS OPPOSITION?"
1970  ENTER 255,N1,N
1980  IF N=1 THEN 2020
1990  IF N=2 THEN 2110
2000  PRINT "PLEASE ENTER A 1 OR A 2."
2010  GOTO 1960
2020  PRINT '18'18'18'18'18'11'7
2030  PRINT
2040  PRINT "ANALYSIS 2"
2050  PRINT
2060  PRINT "COMPARE THE PRO ARGUMENTS OF ALTERNATIVE 1 WITH THE PRO"
2070  PRINT "ARGUMENTS OF ALTERNATIVE 2.  MAKE THE SAME COMPARISON FOR"
2080  PRINT "THE CON ARGUMENTS."
2090  ENTER 60,X1,X
2110  PRINT
2120  PRINT '18'18'18'18'18'11'7
2130  PRINT "IN RETROSPECT -- HAD YOU MADE A CHOICE BEFORE YOU ENTERED"
2140  PRINT "THIS PHASE IN DECAID?"
```

```
2150  INPUT I$
2160  I$=UPS$(I$)
2170  IF I$='YES' THEN 2290
2180  PRINT
2190  PRINT 'DO YOU WANT TO REDISPLAY YOUR ARGUMENTS?'
2200  INPUT J$
2205  J$=UPS$(J$)
2210  IF J$='YES' THEN 2320
2220  IF J$='Y' THEN 2320
2240  GOTO 2270
2250  GOTO 2020
2260  STOP
2270  CHAIN '*IDSF'
2280  STOP
2290  PRINT 'YOUR CHOICE PROCESS MAY BE BIASED.  RUN THE AUDIT'
2300  PRINT 'ROUTINE.'
2310  GOTO 2270
2320  J=1
2330  GOTO 1580
2340  END


LESSON NAME =DECAID          VERSION NUMBER 21


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  YES
TRIALS =   2
RESPONSE FILENAME=  DECRES
STATISTICS FILENAME=  DECSTA
TIME =   180


SECTION #  1

TEXT:
    1  D E C A I D
    2
    3  ^^^WELCOME,^.
    4  \\\\INTRO1,10


SECTION #  2


SECTION OPTIONS:
 ---   KEYWORD
```

```
TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  (A2) DO YOU WANT AN EXPLANATION OF DECAID COMMANDS?

CORRECT ANSWER GROUP
    4  #Y
    5  YES
    6  #A
    7  #T

REPLY FOR THIS GROUP:
    8  &&&


WRONG ANSWER GROUP:

    9  #N
   10  NO

REPLY FOR THIS GROUP:
   11  &&&
   12  $$BRANCH- 4

REPLY TO UNEXPECTED ANSWER:
   13  PLEASE TYPE YES OR NO.
   14  $$BRANCH- 2

FAILURE MESSAGE:
   15  PLEASE TYPE YES OR NO.
   16  $$BRANCH- 2


SECTION #  3


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\INTRO2,10

QUESTION:
    2  (A3) ARE YOU PREPARED TO BEGIN THE DECAID DECISION PROCESS?

CORRECT ANSWER GROUP
    3  #Y
    4  YES
    5  #A
    6  #T

REPLY FOR THIS GROUP:
    7  GOOD.


WRONG ANSWER GROUP:

    8  #N
    9  NO
```

```
REPLY FOR THIS GROUP:
   10  &&&
   11  $$BRANCH- 13

REPLY TO UNEXPECTED ANSWER:
   12  PLEASE TYPE YES OR NO
   13  $$BRANCH- 3

FAILURE MESSAGE:
   14  PLEASE TYPE YES OR NO.
   15  $$BRANCH- 3


SECTION #  4


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  EASTON (1973) STATES "THE DECISION PROCESS BEGINS WITH THE
    2  PERCEPTION OF THE NEED FOR CHANGE.  THERE MAY BE AN INTENSE
    3  DISSATISFACTION WITH THE EXISTING STATE OF AFFAIRS OR MERELY
    4  AN URGE FOR THE IMPROVEMENT OF A GOOD CONDITION.
    5
    6  ...SOMEONE, SOMEWHERE, MUST FEEL AND TRANSMIT PRESSURE FOR A
    7  CHANGE IN THE STATUS QUO."
    8  &&&

QUESTION:
    9  (A4) HAVE YOU IDENTIFIED A DECISION SITUATION WHICH DEMANDS,
   10  OR APPEARS TO DEMAND ACTION?

CORRECT ANSWER GROUP
   11  #Y
   12  YES
   13  #A
   14  #T

REPLY FOR THIS GROUP:
   15  &&&
   16  &&&
   17  &&&
   18  &&&
   19  &&&
   20  GOOD.  THAT IS THE FIRST STEP IN ANY DECISION PROCESS.
   21  &&&Marvin 1971 p.136


WRONG ANSWER GROUP:

   22  #N
   23  NO

REPLY FOR THIS GROUP:
   24  A DECISION SITUATION MUST BE IDENTIFIED BEFORE YOU CAN USE
   25  DECAID.
   26  $$BRANCH- 21
```

```
REPLY TO UNEXPECTED ANSWER:
   27  PLEASE TYPE YES OR NO.
   28  $$BRANCH- 4

FAILURE MESSAGE:
   29  PLEASE TYPE YES OR NO.
   30  $$BRANCH- 4

HINT # 1
   31  MARVIN OFFERS THE FOLLOWING ADVICE RELEVANT TO IDENTIFYING
   32  YOUR DECISION SITUATION: "...DON'T CONFUSE PROBLEMS WITH
   33  OPPORTUNITIES.  SOME BECOME SO SUPERSENSITIVE TO PROBLEMS
   34  THAT THEY HAVE NO TIME TO SPOT OPPORTUNITIES... GOOD DECISIONS
   35  ARE BASED ON THE ABILITY TO DETERMINE THE MOST WORTHWHILE
   36  THINGS TO DO.
   37  &&&
   38  &&&P. 132

HINT # 2
   39  URIS (1970) LISTS THE FOLLOWING AS ESSENTIAL ELEMENTS OF
   40  DECISION MAKING:
   41  1. A situation that demands, or seems to demand action;
   42  2. Time pressure, created by a degenerating of circumstances;
   43  3. Lack of complete information;
   44  4. Uncertainty, suggesting a risk for any decision made;
   45  5. Likelihood of costly consequences if the decision is wrong;
   46  6. Likelihood of benefits of an effective decision;
   47  7. The existence of two or more alternative actions.
   48  &&&Uris 1970 p. 35


SECTION #  5


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&
    3  &&&
    4  &&&
    5  &&&

QUESTION:
    6  (A4) WOULD YOU CATEGORIZE YOUR CURRENT DECISION SITUATION AS
    7  A PROBLEM OR AS AN OPPORTUNITY?

CORRECT ANSWER GROUP
    8  #P
    9  #PROBLEM#

REPLY FOR THIS GROUP:
   10  THE PROBLEM SOLVING ROUTINE IN DECAID IS INCOMPLETE.  YOU
   11  YOU SHOULD EVALUATE PLAUSIBLE CAUSES OF YOUR PROBLEM IN
   12  THE CONTEXT OF THE QUESTIONS IN PROBSL, BUT DON'T LIMIT YOURSELF.
   13  $$BRANCH- 6

CORRECT ANSWER GROUP
   14  #OPPORTUNITY#
   15  #O@@@@@@@@@Y#
   16  #O
```

```
REPLY FOR THIS GROUP:
   17  YOU SHOULD PROCEED SLOWLY.  YOU WILL PROCEED THROUGH THE
   18  FOLOWING STEPS: DEFINITION OF YOUR DECISION QUESTION;
   19  EVALUATION OF YOUR INFORMATION RESOURCES; SELECTION OF
   20  RELEVANT OBJECTIVES; GENERATION OF ALTERNATIVE ACTIONS;
   21  EVALUATION OF YOUR POSSIBLE ACTIONS; CHOICE OF AN ACTION;
   22  A NEW ROUTINE BASED ON THE VROOM-YETTON MODEL HAS RECENTLY
   23  BEEN ADDED.
   24  $$BRANCH- 7

CORRECT ANSWER GROUP
   25  #NEITHER"
   26  "DON'T KNOW"

REPLY FOR THIS GROUP:
   27  REVIEW YOUR DECISION SITUATION.  DECAID WILL TAKE YOU
   28  THROUGH A STANDARD DECISION MAKING SEQUENCE.  IF YOU FIND
   29  UNRESOLVED PROBLEMS, STOP AND THINK.
   30  $$BRANCH- 7

REPLY TO UNEXPECTED ANSWER:
   31  I DON'T RECOGNIZE YOUR ANSWER, BUT YOU WILL CONTINUE
   32  ON A STANDARD DECAID SEQUENCE.  USE THE //STOP COMMAND
   33  IF YOU ARE HAVING PROBLEMS OR ARE JUST PLAIN BORED.
   34  $$BRANCH- 7

HINT # 1
   35  A PROBLEM INVOLVES A DEVIATION OF PERFORMANCE FROM THE
   36  NORM OR EXPECTED BEHAVIOR OF A PERSON OR SYSTEM.  AN
   37  OPPORTUNITY IS A CHANCE TO INCREASE YOUR EXPECTATIONS
   38  OR STANDARDS AND THEREFORE A CHANCE TO INSTITUTE NEW
   39  POLICIES OR ACTIONS.


SECTION #  6


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\PROBSL,10
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  DO YOU HAVE A SOLUTION FOR YOUR PROBLEM? DO YOU
    6  KNOW WHAT THE CAUSE OF THE PROBLEM IS?  ARE YOU
    7  READY TO PROCEED WITH DECAID AND DETERMINE WHAT
    8  ACTION YOU WILL TAKE TO REMOVE OR ELIMINATE YOUR
    9  PROBLEM SITUATION?

CORRECT ANSWER GROUP
   10  #YES#
   11  #Y
   12  #A
   13  #P
```

```
REPLY FOR THIS GROUP:
   14  GOOD.
   15  DECAID WILL USE THE FOLLOWING STRATEGY:
   16  1) DEFINE AN ACCURATE DECISION QUESTION
   17  2) DETERMINE APPROPRIATE DECISION PROCESS
   18  3) SELECT RELEVANT ORGANIZATIONAL OBJECTIVES
   19  4) GENERATE ALTERNATIVE ACTIONS
   20  5) EVALUATE ALL POSSIBLE ACTIONS
   21  6) SELECT FROM THE TWO "BEST" ALTERNATIVES
   22  YOUR CHOICE
   23  7) AUDIT YOUR DECISION PROCESS

CORRECT ANSWER GROUP
   24  #N

REPLY FOR THIS GROUP:
   25  YOU MUST REANALYZE YOUR SITUATION BEFORE CONTINUING WITH DECAID.
   26  $$BRANCH- 17

REPLY TO UNEXPECTED ANSWER:
   27  YOU ARE BEING BRANCHED TO THE SIGN OFF ROUTINE.
   28  $$BRANCH- 17

HINT # 1
   29  PROBLEM SOLVING IS BUT A PART OF THE DECISION MAKING
   30  PROCESS,  ONCE YOU HAVE DETERMINED THE CAUSE OF A
   31  PROBLEM YOU MUST DECIDE WHAT ACTION YOU WILL TAKE
   32  TO RESOLVE THE SITUATION.


SECTION #  7


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  GIVEN A RATING SCALE WHERE (1) MEANS VERY SIGNIFICANT;
    6  (3) MEANS SIGNIFICANT; AND (5) MEANS INSIGNIFICANT,
    7  (A5) THEN HOW SIGNIFICANT IS YOUR DECISION SITUATION?

CORRECT ANSWER GROUP
    8  #1#
    9  #V
   10  VERY

REPLY FOR THIS GROUP:
   11  YOU BELIEVE YOUR SITUATION IS VERY IMPORTANT. YOU ARE
   12  BEING BRANCHED DIRECTLY TO QUEST - THE QUESTION DEFINITION
   13  PHASE OF DECAID.  ORGANIZE YOUR INFORMATION.
   14  )))QUEST,1
```

```
WRONG ANSWER GROUP:

   15  *3*
   16  SIGNIFICANT

REPLY FOR THIS GROUP:
   17  YOU DON'T SEEM CERTAIN THAT YOUR DECISION SITUATION IS IMPORTANT
   18  TO YOUR ORGANIZATION.    IF YOU HAVE DOUBTS ABOUT YOUR PRIORITIES
   19  YOU SHOULD STOP AND THINK.  USE THE STOP COMMAND IF YOU WANT TO
   20  REASSESS YOUR PRIORITIES.
   21  $$BRANCH- 8


WRONG ANSWER GROUP:

   22  *5*

REPLY FOR THIS GROUP:
   23  YOU SHOULD NOT USE DECAID TO HELP RESOLVE THIS DECISION
   24  SITUATION.  YOU ARE WASTING YOU TIME AND DECAID'S TIME.
   25  YOU ARE BEING BRANCHED TO THE SIGN OFF ROUTINE.
   26  $$BRANCH- 13

REPLY TO UNEXPECTED ANSWER:
   27  PLEASE TYPE 1,3 OR 5.
   28  $$BRANCH- 7

FAILURE MESSAGE:
   29  PLEASE TYPE 1,3 OR 5.
   30  $$BRANCH- 7

HINT # 1
   31  A VERY SIGNIFICANT DECISION SITUATION HAS IMPORTANT
   32  CONSEQUENCES FOR YOUR ORGANIZATION.  YOU PERCEIVE
   33  LARGE BENEFITS FROM A "GOOD" DECISION OR NUMEROUS
   34  DISADVANTAGES OR COSTS FROM NO DECISION OR A "BAD"
   35  DECISION.


SECTION #  8


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  IT IS OFTEN SAID THAT AT LEAST HALF (SOME SAY 90%) OF THE
    2  DECISION MAKING TASK INVOLVES DEFINING PRECISELY WHAT THE
    3  DECISION QUESTION IS.  DEFINING AN INAPPROPRIATE DECISION
    4  QUESTION MEANS THAT YOU HAVE COMMITTED AN ERROR OF THE THIRD
    5  TYPE.  DECAID ATTEMPTS TO HELP YOU AVOID THIS ERROR.
    6  QUESTION DEFINITION IS A DIVERGENT ACTIVITY -- FIND
    7  CREATIVE, INTUITIVE ALTERNATIVE DECISION QUESTIONS.
    8  DON'T RESTRICT THE POSSIBILITIES UNTIL YOU HAVE CONSIDERED
    9  THEM.
   10  &&&
   11  &&&Horton 1970 p. 70

QUESTION:
   12  (A6) HAVE YOU STATED AND DEFINED A DECISION QUESTION?
```

```
CORRECT ANSWER GROUP
   13  *Y
   14  YES
   15  *A
   16  *T

REPLY FOR THIS GROUP:
   17  &&&
   18  &&&


WRONG ANSWER GROUP:

   19  *N
   20  *NO*
   21  NO

REPLY FOR THIS GROUP:
   22  YOU ARE BEING BRANCHED TO QUEST -- THE QUESTION
   23  DEFINITION PHASE OF DECAID.
   24  )))QUEST,1


WRONG ANSWER GROUP:

   25  MAYBE
   26  *GUESS*
   27  MAYBE*
   28  *MAYBE*

REPLY FOR THIS GROUP:
   29  YOU ARE UNCERTAIN ABOUT THE STATUS OF YOUR DECISION
   30  QUESTION.  DECAID IS BRANCHING YOU TO QUEST -- THE
   31  QUESTION DEFINITION PHASE.
   32  )))QUEST,1

REPLY TO UNEXPECTED ANSWER:
   33  PLEASE TYPE YES OR NO.
   34  $$BRANCH- 8

FAILURE MESSAGE:
   35  PLEASE TYPE YES OR NO.
   36  $$BRANCH- 8

HINT # 1
   37  A DECISION QUESTION CATEGORIZES THE SUBJECT OF
   38  YOUR DECISION SITUATION.  IT IS WRITTEN IN THE
   39  ACTIVE VOICE AND AN ACTION IS USUALLY STATED OR
   40  IMPLIED.


SECTION #  9


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  \\\\DEFIN2,10
```

```
QUESTION:
    3  (A7) IS YOUR DECISION QUESTION CORRECTLY ENTERED IN DECAID'S
    4  MEMORY?

CORRECT ANSWER GROUP
    5  YES
    6  *Y
    7  *A
    8  *P

REPLY FOR THIS GROUP:
    9  GOOD. YOUR DECISION QUESTION WILL BE REDISPLAYED AT APPROPRIATE
   10  POINTS IN THE DECISION PROCESS.

CORRECT ANSWER GROUP
   11  NO
   12  *N

REPLY FOR THIS GROUP:
   13  PLEASE RE-ENTER YOUR QUESTION.  YOU MAY USE 65 CHARACTERS IN
   14  YOUR RESPONSE.
   15  **BRANCH- 9

REPLY TO UNEXPECTED ANSWER:
   16  PLEASE CONTINUE.  IF YOU FIND THAT YOUR DECISION QUESTION IS
   17  IMPROPERLY DEFINED TYPE //GOTO-7.  THIS COMMAND WILL ALLOW YOU
   18  TO RETURN TO THE QUESTION WHICH ENTERS YOUR DQ IN DECAID'S
   19  MEMORY.

FAILURE MESSAGE:
   20  PLEASE CONTINUE.


SECTION #  10


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  BEFORE YOU ARE BRANCHED TO THE NEXT PHASE OF THE DECISION MAKING
    2  PROCESS, DECAID WANTS YOU TO CONSIDER THE POSSIBILITY THAT YOU
    3  HAVE DEFINED YOUR DECISION QUESTION INACCURATELY.  ALTHOUGH YOU
    4  BELIEVE THAT YOUR ANALYSIS IS CORRECT, DON'T MAKE AN ERROR --
    5  PLEASE REEVALUATE YOUR INFERENCES AND REASONING.
    6  &&&


SECTION #  11


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  ON A SCALE WHERE 100% INDICATES CERTAINTY AND 0% INDICATES
    4  UNCERTAINTY ....
    5  (A11) HOW CERTAIN ARE YOU THAT YOU HAVE DEFINED THE DECISION
    6  QUESTION WHICH BEST CHARACTERIZES YOUR DECISION SITUATION?
```

```
CORRECT ANSWER GROUP
    7  CERTAIN
    8  100
    9  99.9
   10  &&&

REPLY FOR THIS GROUP:
   11  YOU MAY BE OVERCONFIDENT.  DON'T ASSUME TOO MUCH.

CORRECT ANSWER GROUP
   12  99
   13  98
   14  97
   15  96
   16  95

REPLY FOR THIS GROUP:
   17  YOU SEEM CONFIDENT THAT YOUR DECISION QUESTION IS APPROPRIATE.
   18  YOU MAY WANT TO ASK YOURSELF WHAT JUSTIFIES YOUR CONFIDENCE.

CORRECT ANSWER GROUP
   19  90
   20  85
   21  80
   22  75

REPLY FOR THIS GROUP:
   23  ALTHOUGH YOU ARE CONFIDent THAT YOUR DECISION QUESTION
   24  IS APPROPRIATE, YOU ADMIT THAT IT MAY BE INCORRECT.  YOU
   25  SHOULD PROBABLY USE QUEST.

REPLY TO UNEXPECTED ANSWER:
   26  YOU SEEM LESS THAN CERTAIN ABOUT YOUR CURRENT DECISION QUESTION'S
   27  APPROPRIATENESS.  YOU MAY COMMITT AN ERROR OF THE THIRD KIND --
   28  THE ERROR OF SOLVING THE WRONG PROBLEM OR OF DECIDING A QUESTION
   29  THAT DOESN'T ADDRESS APPROPRIATELY THE OPPORTUNITY OR PROBLEM IN
   30  YOUR DECISION SITUATION -- YOU SHOULD GO SLOWLY AT THIS POINT.
   31  DON'T WASTE YOUR TIME, MISS AN OPPORTUNITY OR INCUR NEEDLESS
   32  COSTS.
   33  )))QUEST,1
   34  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   35  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

FAILURE MESSAGE:
   36  YOU ARE BEING BRANCHED TO QUEST -- THE QUESTION DEFINITION
   37  PHASE OF DECAID.
   38  )))quest,1

HINT # 1
   39  HOW CONFIDENT ARE YOU THAT YOU DECISION QUESTION ACCURATELY
   40  CHARACTERIZES YOUR DECISION SITUATION?
   41  &&&


SECTION #  12

TEXT:
    1  QUEST IS THE NAME OF THE QUESTION DEFINITION PHASE OF DECAID.
    2  \\\\REMEM,10
```

```
QUESTION:
    3  (A10) DO YOU WANT TO USE QUEST TO EVALUATE YOUR DECISION
    4  SITUATION?

CORRECT ANSWER GROUP
    5  YES
    6  Y
    7  A

REPLY FOR THIS GROUP:
    8  BRANCHING ......
    9  )))QUEST,1


WRONG ANSWER GROUP:

   10  NO
   11  N
   12  N
   13  NEGATIVE

REPLY FOR THIS GROUP:
   14  OK.
   15  $$BRANCH- 20

REPLY TO UNEXPECTED ANSWER:
   16  WELL. YOU ARE BEING BRANCHED TO QUEST.
   17  )))QUEST,1

FAILURE MESSAGE:
   18  PLEASE USE QUEST.
   19  )))QUEST,1


SECTION #  13


SECTION OPTIONS:
       KEYWORD
    1  TRIALS =  2

TEXT:
    2  YOU ARE ENTERING THE DECAID SIGN OFF ROUTINE.
    3  &&&

QUESTION:
    4  (A11) ARE YOU HAVING DIFFICULTY USING DECAID?

CORRECT ANSWER GROUP
    5  #Y
    6  #A
    7  #P

REPLY FOR THIS GROUP:
    8  WELL... DON'T GET DISCOURAGED.

CORRECT ANSWER GROUP
    9  #N
   10  &&&
   11  &&&
```

```
REPLY FOR THIS GROUP:
   12  GOOD. I HOPE YOU UNDERSTAND WHAT PROMPTED DECAID TO
   13  SEND YOU TO THE SIGN OFF ROUTINE.  IF YOU THINK THE
   14  BRANCH WAS INAPPROPRIATE, PLEASE NOTE THE QUESTION YOU WERE ASKED
   15  PRIOR TO THE BRANCH, THEN DISCUSS THE PROBLEM WITH DANIEL POWER.
   16  $$BRANCH- 16

REPLY TO UNEXPECTED ANSWER:
   17  PLEASE TYPE YES OR NO.

FAILURE MESSAGE:
   18  PLEASE CONTINUE.


SECTION #  14


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  (A12) HAVE YOU READ THE DECAID STUDENT MANUAL?

CORRECT ANSWER GROUP
    4  #Y
    5  #A
    6  #P

REPLY FOR THIS GROUP:
    7  GOOD.  IF YOU NEED HELP, DISCUSS YOUR QUESTIONS ABOUT DECAID WITH
    8  DAN POWER.  IF YOU ARE HAVING PROBLEMS WITH THE TERMINAL
    9  ASK A MONITOR.


WRONG ANSWER GROUP:

   10  #N
   11  &&&

REPLY FOR THIS GROUP:
   12  YOU SHOULD READ THE DECAID MANUAL BEFORE YOU PROCEED.
   13  &&&
   14  $$BRANCH- 16

REPLY TO UNEXPECTED ANSWER:
   15  THE DECAID STUDENT MANUAL IS AN IMPORTANT INFORMATION
   16  RESOURCE.  IF YOU HAVE QUESTIONS ASK DAN POWER.

FAILURE MESSAGE:
   17  PLEASE CONTINUE.


SECTION #  15


SECTION OPTIONS:
       KEYWORD
```

```
TEXT:
    1  $$$
    2  $$$

QUESTION:
    3  (A13) HAVE YOU USED THE //HINT COMMAND?

CORRECT ANSWER GROUP
    4  #Y
    5  #A
    6  #P

REPLY FOR THIS GROUP:
    7  GOOD. I HOPE THAT THE INFORMATION WAS INFORMATIVE AND
    8  HELPFUL.


WRONG ANSWER GROUP:

    9  #N
   10  $$$

REPLY FOR THIS GROUP:
   11  THE //HINT COMMAND OFTEN PROVIDES INFORMATION USEFUL IN
   12  ANSWERING DECAID QUESTIONS.  CONSIDER USING THIS OPTION
   13  IN THE FUTURE.
   14  $$BRANCH- 16

REPLY TO UNEXPECTED ANSWER:
   15  OK.

FAILURE MESSAGE:
   16  PLEASE CONTINUE.


SECTION #  16


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  A NEGATIVE RESPONSE TO THIS QUESTION TERMINATES FUTURE ACCESS
    2  TO THE DECAID SYSTEM.  AN AFFIRMATIVE RESPONSE CONTINUES YOUR
    3  USER NUMBER, IF YOU ARE ENTERED AS A REGULAR DECAID USER.

QUESTION:
    4  DO YOU WANT TO CONTINUE AS A DECAID USER?

CORRECT ANSWER GROUP
    5  #Y
    6  #A
    7  #P

REPLY FOR THIS GROUP:
    8  OK.


WRONG ANSWER GROUP:

    9  #N
```

```
REPLY FOR THIS GROUP:
   10  YOU ARE BEING TERMINATED AS A DECAID USER.
   11  $$BRANCH- 91


WRONG ANSWER GROUP:

   12  #D
   13  #M
   14  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   15  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
   16  YOU ARE BEING MAINTAINED AS A DECAID USER.
   17  &&&
   18  $$BRANCH- 17

REPLY TO UNEXPECTED ANSWER:
   19  YOU WILL CONTINUE AS A DECAID USER.
   20  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   21  $$BRANCH- 17

FAILURE MESSAGE:
   22  DECAID ASSUMES YOU WANT TO CONTINUE AS A DECAID USER.


SECTION #  17


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  (A15) ARE YOU READY TO SIGN OFF.

CORRECT ANSWER GROUP
    3  &&&
    4  &&&
    5  &&&

REPLY FOR THIS GROUP:
    6  PLEASE USE THE STOP COMMAND IN RESPONSE TO THE NEXT
    7  QUESTION.


WRONG ANSWER GROUP:

    8  #N

REPLY FOR THIS GROUP:
    9  OK.
   10  $$BRANCH- 2


WRONG ANSWER GROUP:

   11  #Y
   12  #A
   13  #P
```

```
REPLY FOR THIS GROUP:
   14  PLEASE USE THE STOP COMMAND IN RESPONSE TO THE NEXT
   15  QUESTION.
   16  $$BRANCH- 19

REPLY TO UNEXPECTED ANSWER:
   17  $$BRANCH- 19

FAILURE MESSAGE:
   18  $$BRANCH- 19


SECTION #  18

TEXT:
    1  !!!RESTART TEXT FOLLOWS
    2  DECAID SIGNED ON.
    3
    4  ^^^WELCOME BACK,^.
    5  \\\\PHASES,10
    6  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***


SECTION #  19


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  PHASE CONTROL.
    2
    3  &&&        ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
    4  TYPE //STOP AT THIS POINT IF YOU WANT A PROGRAMMED
    5  EXIT FROM THE DECAID SEQUENCE.

QUESTION:
    6  (A17) PHASE? #

CORRECT ANSWER GROUP
    7  1
    8  QUEST

REPLY FOR THIS GROUP:
    9  )))QUEST,1


WRONG ANSWER GROUP:

   10  2
   11  QUESTION EVALUATION


WRONG ANSWER GROUP:

   12  #
   13  3
   14  &&&
```

```
REPLY FOR THIS GROUP:
   15  &&&

WRONG ANSWER GROUP:

   16  &&&
   17  4

REPLY FOR THIS GROUP:
   18  &&&

WRONG ANSWER GROUP:

   19  5
   20  &&&

REPLY FOR THIS GROUP:
   21  &&&

WRONG ANSWER GROUP:

   22  6
   23  &&&

REPLY FOR THIS GROUP:
   24  &&&

WRONG ANSWER GROUP:

   25  7
   26  &&&

REPLY FOR THIS GROUP:
   27  &&&

WRONG ANSWER GROUP:

   28  8
   29  &&&

REPLY FOR THIS GROUP:
   30  &&&

WRONG ANSWER GROUP:

   31  9
   32  &&&

REPLY FOR THIS GROUP:
   33  &&&

WRONG ANSWER GROUP:

   34  10
   35  &&&
```

```
REPLY FOR THIS GROUP:
   36  &&&


WRONG ANSWER GROUP:

   37  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   38  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   39  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
   40  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   41  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***


WRONG ANSWER GROUP:

   42  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   43  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   44  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
   45  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   46  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY TO UNEXPECTED ANSWER:
   47  $$BRANCH- 2

FAILURE MESSAGE:
   48  $$BRANCH- 2


SECTION #  20


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  (A18) DO YOU WANT TO CONTINUE?

CORRECT ANSWER GROUP
    3  #Y
    4  #A
    5  #P

REPLY FOR THIS GROUP:
    6  )))QUEST,14


WRONG ANSWER GROUP:

    7  #N

REPLY FOR THIS GROUP:
    8  $$BRANCH- 16
```

```
REPLY TO UNEXPECTED ANSWER:
    9  &&&
   10  $$BRANCH- 13

FAILURE MESSAGE:
   11  &&&
   12  $$BRANCH- 13


SECTION #  21


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  DECISION IDENTIFICATION.
    2
    3  (PROGRAMMING IS NOT COMPLETE.)

QUESTION:
    4  (A19) IS YOUR DOMAIN OF RESPONSIBILITY UNDER CONTROL?

CORRECT ANSWER GROUP
    5  #Y
    6  #A
    7  #P

REPLY FOR THIS GROUP:
    8  YOU DON'T NEED DECAID AT THIS TIME.
    9  $$BRANCH- 17


WRONG ANSWER GROUP:

   10  #N

REPLY FOR THIS GROUP:
   11  DETERMINE WHAT THE DISCREPANCY IS BETWEEN -- WHAT IS
   12  AND WHAT SHOULD BE.  IF ACTUAL PERFORMANCE IS GREATER
   13  THAN EXPECTED YOU HAVE AN OPPORTUNITY.  IF LESS THEN
   14  YOU HAVE A PROBLEM.  USE QUEST TO HELP DEFINE YOUR
   15  DECISION QUESTION IF YOU HAVE FURTHER DIFFICULTY.
   16  $$BRANCH- 4

REPLY TO UNEXPECTED ANSWER:
   17  $$BRANCH- 13

FAILURE MESSAGE:
   18  $$BRANCH- 13

NO BRANCHING SPECIFIED


 DECGO2

 10  ENTER 6,A0,A1
 30  PRINT "D E C G O L"
 40  PRINT
 50  PRINT "YOU ARE ENTERING DECGOL, THE GOAL EVALUATION PHASE OF DECAID."
```

```
60  ENTER 6,A1,A0
70  PRINT
80  PRINT 'IT IS IMPORTANT TO IDENTIFY WHICH ORGANIZATIONAL OBJECTIVES'
90  PRINT 'SHOULD BE CONSIDERED RELEVANT TO EACH INDIVIDUAL DECISION QUESTION.'
100  PRINT
150  PRINT
160  PRINT 'CHARACTERISTICS OF OBJECTIVES'
170  PRINT
180  PRINT '1. OBJECTIVES SHOULD SPECIFY A DESIRED PERFORMANCE.'
190  PRINT '2. OBJECTIVES SHOULD BE MEASURABLE.'
200  PRINT '3. OBJECTIVES SHOULD BE DYNAMIC.'
210  PRINT '4. OBJECTIVES SHOULD SPECIFY THE CONDITIONS UNDER WHICH THEY'
220  PRINT 'WILL BE MET.'
230  ENTER 30,A0,A1
240  CHAIN '*IDSF'
250  END


LESSON NAME =DECGOL          VERSION NUMBER 29


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  YES
TRIALS =   2
RESPONSE FILENAME=  DECG1
STATISTICS FILENAME=  DECG2
TIME =   180


SECTION #  1


SECTION OPTIONS:
     KEYWORD

TEXT:
    1  \\\\DECG02,10
    2
    3
    4  CONSIDER BOTH SHORT AND LONG RUN GOALS.

QUESTION:
    5  (D1) CAN YOU LIST WHAT GOALS ARE RELEVANT
    6  TO YOUR DECISION QUESTION?
```

```
CORRECT ANSWER GROUP
    7  #Y

REPLY FOR THIS GROUP:
    8  Y
    9  $$BRANCH- 2

CORRECT ANSWER GROUP
   10  #N
   11  #DEFINITELY NOT#
   12  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   13  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   14  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
   15  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   16  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   17  $$BRANCH- 14

REPLY TO UNEXPECTED ANSWER:
   18  &&&
   19  $$BRANCH- 2

FAILURE MESSAGE:
   20  &&&
   21  $$BRANCH- 2

HINT # 1
   22  ONE CAN APPROACH THE TELEOLOGICAL BEHAVIOR OF SYSTEMS FROM THREE
   23  TIME HORIZONS: THE VERY LONG RANGE  IS THE LEVEL OF IDEALS; THE
   24  LONG RANGE IS THE LEVEL OF OBJECTIVES; AND THE SHORT RANGE IS
   25  THE LEEVEL OF GOALS.


SECTION #  2


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  CAN YOU ASSIGN PRIORITIES TO THESE GOALS OR ARRANGE THEM  IN
    3  A HIERARCHY?

CORRECT ANSWER GROUP
    4  #Y
    5  #A

REPLY FOR THIS GROUP:
    6  &&&
    7  $$BRANCH- 3

  WRONG ANSWER GROUP:

      8  #N

  REPLY FOR THIS GROUP:
      9  &&&
     10  $$BRANCH- 4
```

```
REPLY TO UNEXPECTED ANSWER:
   11  PLEASE ANSWER YES OR NO.
   12  $$BRANCH- 2

FAILURE MESSAGE:
   13  $$BRANCH- 4

HINT # 1
   14  PRIORITIES ARE IMPORTANT IN ANY EVALUATION.  A PRIORITY
   15  INDICATES THE IMPORTANCE OF A GOAL OR OBJECTIVE.  YOU
   16  SHOULD ATTEMPT TO ASSESS ORGANIZATIONAL PRIORITIES.


SECTION #  3

TEXT:
    1  GOAL ANALYSIS

QUESTION:
    2  WHAT GOAL ARE YOU ANALYZING?

CORRECT ANSWER GROUP
    3  &&&
    4  $$BRANCH-6
    5  $$BRANCH-6

REPLY FOR THIS GROUP:
    6  &&&
    7  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
    8  &&&
    9  $$BRANCH- 6

FAILURE MESSAGE:
   10  &&&
   11  $$BRANCH- 6


SECTION #  4

TEXT:
    1  &&&

QUESTION:
    2  CAN YOU COMBINE OR RECONCILE YOUR GOALS?

CORRECT ANSWER GROUP
    3  YES
    4  Y

REPLY FOR THIS GROUP:
    5  &&&
    6  $$BRANCH- 2


WRONG ANSWER GROUP:

    7  NO
    8  N
```

```
REPLY FOR THIS GROUP:
    9  &&&
   10  $$BRANCH- 5

REPLY TO UNEXPECTED ANSWER:
   11  PLEASE TYPE YES OR NO.

FAILURE MESSAGE:
   12  &&&
   13  $$BRANCH- 5

HINT # 1
   14  &&&
   15  &&&


SECTION #  5

TEXT:
    1  &&&

QUESTION:
    2  (D5) DO YOU WANT TO REFORMULATE YOUR GOALS?

CORRECT ANSWER GROUP
    3  YES
    4  Y

REPLY FOR THIS GROUP:
    5  AGAIN ....
    6  $$BRANCH- 14


WRONG ANSWER GROUP:

    7  NO
    8  N

REPLY FOR THIS GROUP:
    9  )))ALTGEN,1
   10  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   11  PLEASE TYPE YES OR NO.

FAILURE MESSAGE:
   12  $$BRANCH- 91

HINT # 1
   13  $$&&&


SECTION #  6

QUESTION:
    1  WHAT PRIORITY HAVE YOU ASSIGNED THIS GOAL?
    2  1 = HIGH     2 = LOW      3 = NO PRIORITY
```

```
CORRECT ANSWER GROUP
    3  1
    4  HIGH

REPLY FOR THIS GROUP:
    5  THESE GOALS ARE MUST GOALS.  AN
    6  ALTERNATIVE MUST FURTHER THE ACCOMPLISHMENT OF THESE
    7  GOALS IF IT IS TO BE SELECTED AS YOUR FINAL DECISION.

CORRECT ANSWER GROUP
    8  2
    9  LOW

REPLY FOR THIS GROUP:
   10  THESE GOALS ARE OFTEN CALLED WANT GOALS.
   11  YOU SHOULD LOOK AT THEM AS SECONDARY BENEFITS.  IT IS
   12  NICE IF YOU ACHIEVE THEM, BUT CERTAINLY NOT ESSENTIAL.

CORRECT ANSWER GROUP
   13  3

REPLY FOR THIS GROUP:
   14  WHY DID YOU INCLUDE THIS "GOAL" IN
   15  YOUR LIST?  YOU SHOULD ELIMINATE IT FROM FURTHER
   16  CONSIDERATION.
   17  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   18  ANSWER 1 OR 2 OR 3.

FAILURE MESSAGE:
   19  $$BRANCH- 5

HINT # 1
   20  $$$
   21  $$$


SECTION #  7

TEXT:
    1  IT IS IMPORTANT THAT A GOAL DESCRIBE THE PERFORMANCE DESIRED
    2  --CONDITIONS UNDER WHICH IT MUST BE PERFORMED-- A STANDARD.

QUESTION:
    3  CAN YOU QUANTIFY YOUR GOAL?

CORRECT ANSWER GROUP
    4  YES
    5  Y


WRONG ANSWER GROUP:

    6  NO
    7  N

REPLY FOR THIS GROUP:
    8  $$BRANCH- 9
```

```
REPLY TO UNEXPECTED ANSWER:
    9  PLEASE TYPE YES OR NO.

FAILURE MESSAGE:
   10  $$BRANCH- 3

HINT # 1
   11  &&&
   12  &&&
   13  &&&


SECTION #  8

QUESTION:
    1  RESTATE YOUR QUANTIFIED GOAL.
    2  WHAT IS YOU NEW GOAL STATEMENT?

CORRECT ANSWER GROUP
    3  &&&

REPLY FOR THIS GROUP:
    4  $$BRANCH- 12

REPLY TO UNEXPECTED ANSWER:
    5  $$BRANCH- 12

FAILURE MESSAGE:
    6  $$BRANCH- 3


SECTION #  9

TEXT:
    1  &&&

QUESTION:
    2  CAN YOU CREATE A QUALITATIVE TARGET OR
    3  STANDARD AS A RESTATEMENT OF YOUR GOAL?

CORRECT ANSWER GROUP
    4  YES
    5  Y

REPLY FOR THIS GROUP:
    6  &&&


WRONG ANSWER GROUP:

    7  NO
    8  N

REPLY FOR THIS GROUP:
    9  $$BRANCH- 11

REPLY TO UNEXPECTED ANSWER:
   10  &&&
   11  $$BRANCH- 11
```

```
FAILURE MESSAGE:
   12  $$BRANCH- 11

HINT # 1
   13  &&&
   14  &&&


SECTION #  10

QUESTION:
    1  WHAT IS YOUR TARGET?

CORRECT ANSWER GROUP
    2  &&&

REPLY FOR THIS GROUP:
    3  $$BRANCH- 12

REPLY TO UNEXPECTED ANSWER:
    4  $$BRANCH- 12

FAILURE MESSAGE:
    5  $$BRANCH- 12

HINT # 1
    6  &&&


SECTION #  11

QUESTION:
    1  WHAT ARE YOU TRYING TO ACCOMPLISH?

CORRECT ANSWER GROUP
    2  &&&

REPLY TO UNEXPECTED ANSWER:
    3  $$BRANCH- 12

FAILURE MESSAGE:
    4  $$BRANCH- 12


SECTION #  12

QUESTION:
    1  IS THIS OBJECTIVE BOTH REALISTIC AND DESIRABLE?

CORRECT ANSWER GROUP
    2  YES
    3  Y

REPLY FOR THIS GROUP:
    4  &&&


WRONG ANSWER GROUP:

    5  NO
    6  N
```

```
REPLY FOR THIS GROUP:
    7  YOU SHOULD EITHER REFORMULATE OR
    8  ELIMINATE THIS OBJECTIVE FROM CONSIDERATION.

REPLY TO UNEXPECTED ANSWER:
    9  PLEASE TYPE YES OR NO.


SECTION #  13

QUESTION:
    1  DO YOU WANT TO EVALUATE ANOTHER GOAL?

CORRECT ANSWER GROUP
    2  YES
    3  Y

REPLY FOR THIS GROUP:
    4  $$BRANCH- 3


WRONG ANSWER GROUP:

    5  NO
    6  N

REPLY FOR THIS GROUP:
    7  )))ALTGEN,1

REPLY TO UNEXPECTED ANSWER:
    8  )))ALTGEN,1


SECTION #  14


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  $$$

QUESTION:
    2  DO YOU WANT TO CONTINUE THE DECAID PROGRAM?

CORRECT ANSWER GROUP
    3  #Y
    4  #A
    5  #P

REPLY FOR THIS GROUP:
    6  ALLRIGHT, BUT YOU MUST ATTEMPT TO LIST AND EVALUATE
    7  APPROPRIATE GOALS>


WRONG ANSWER GROUP:

    8  #N
    9  $$$
```

```
REPLY FOR THIS GROUP:
   10  YOU ARE BEING BRANCHED TO THE SIGN OFF ROUTINE.
   11  )))DECAID,13

REPLY TO UNEXPECTED ANSWER:
   12  PLEASE TYPE YES OR NO.

FAILURE MESSAGE:
   13  PLEASE TYPE YES OR NO.


SECTION #  15


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  SPECIFYING GOALS IS AN IMPORTANT PART OF THE DECISION PROCESS.
    2
    3  GOALS ARE OFTEN CLASSIFIED IN THREE CATEGORIES--
    4      ENVIRONMENTAL
    5      ORGANIZATIONAL
    6      PERSONAL

QUESTION:
    7  HAVE YOU THOUGHT ABOUT WHAT GOALS MAY BE RELEVANT TO
    8  THIS SITUATION?

CORRECT ANSWER GROUP
    9  #Y
   10  #A
   11  #$P
   12  #P

REPLY FOR THIS GROUP:
   13  GOOD.


WRONG ANSWER GROUP:

   14  #N

REPLY FOR THIS GROUP:
   15  DO SO NOW.

REPLY TO UNEXPECTED ANSWER:
   16  PLEASE TYPE YES OR NO

FAILURE MESSAGE:
   17  PLEASE TYPE YES OR NO

HINT # 1
   18  &&&
   19  &&&&
   20  &&&
```

```
SECTION #  16


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  $$$

QUESTION:
    2  HAVE YOU! TALKED WITH OTHER PEOPLE ABOUT WHAT
    3  GOALS MIGHT BE RELEVANT?

CORRECT ANSWER GROUP
    4  #Y

REPLY FOR THIS GROUP:
    5  TRY TO INCORPORATE THEIR IDEAS WITH YOURS.
    6  $$BRANCH- 1


WRONG ANSWER GROUP:

    7  #N

REPLY FOR THIS GROUP:
    8  WELL YOU MAY NEED TO TALK WITH YOUR COLLEAGUES.
    9  $$BRANCH- 1

REPLY TO UNEXPECTED ANSWER:
   10  PLEAE TYPE YES OR NO.

FAILURE MESSAGE:
   11  PLEASE TYPE YES OR NO.

NO BRANCHING SPECIFIED


LESSON NAME =DECINF          VERSION NUMBER 23


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  YES
TRIALS =   2
RESPONSE FILENAME=  DECIN1
STATISTICS FILENAME=  DECIN2
TIME =   180
```

```
SECTION #  1

TEXT:
    1  YOU ARE ENTERING THE INFORMATION EVALUATION PHASE OF
    2  DECAID.

QUESTION:
    3  (C1) DO YOU NEED ADDITIONAL INFORMATION TO COMPLETELY
    4  ANALYZE YOUR DECISION QUESTION?

CORRECT ANSWER GROUP
    5  NO
    6  N

REPLY FOR THIS GROUP:
    7  DON'T ASSUME YOU KNOW THE FACTS, ASK THE RIGHT QUESTIONS.


WRONG ANSWER GROUP:

    8  YES
    9  Y

REPLY FOR THIS GROUP:
   10  YOU MAY NEED MORE FINANCIAL DATA, FACTS ABOUT THE ORGANIZATION,
   11  FACTS ABOUT WHAT INTEREST GROUPS ARE EFFECTED AND HOW, ETC.
   12  $$BRANCH- 3

REPLY TO UNEXPECTED ANSWER:
   13  $$BRANCH- 3

FAILURE MESSAGE:
   14  PLEASE RESPOND WITH YES OR NO.

HINT # 1
   15  INFORMATION INCLUDES BOTH FACTS AND OPINIONS.
   16  &&&
   17  &&&
   18  &&&


SECTION #  2

TEXT:
    1  )))ROUTIN,1

QUESTION:
    2  HAVE YOU RESOLVED SIMILAR QUESTIONS?

CORRECT ANSWER GROUP
    3  YES
    4  Y

REPLY FOR THIS GROUP:
    5  $$BRANCH- 6


WRONG ANSWER GROUP:

    6  NO
    7  N
```

```
REPLY FOR THIS GROUP:
    8  $$BRANCH- 7

REPLY TO UNEXPECTED ANSWER:
    9  BRANCH-
   10  $$BRANCH- 7

FAILURE MESSAGE:
   11  PLEASE RESPOND YES OR NO.

HINT # 1
   12  REASONING BY USE OF ANALOGY IS VALID IN SOME CASES.
   13  DON'T AUTOMATICALLY EXCLUDE YOUR PAST EXPERIENCES.


SECTION #  3

TEXT:
    1  &&&
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  CAN YOU AFFORD THE COST ASSOCIATED WITH POSTPONING
    6  A DECISION UNTIL ALL NECESSARY AND PERTINENT INFORMATION IS
    7  AVAILABLE?

CORRECT ANSWER GROUP
    8  YES
    9  Y

REPLY FOR THIS GROUP:
   10  &&&
   11  $$BRANCH- 4


WRONG ANSWER GROUP:

   12  NO
   13  N

REPLY FOR THIS GROUP:
   14  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   15  $$BRANCH- 2

FAILURE MESSAGE:
   16  RESPOND YES OR NO.

HINT # 1
   17  THE COST OF OBTAINING ADDITIONAL INFORMATION
   18  IS DIFFICULT TO CALCULATE AND CONVERSELY THE
   19  VALUE OF EITHER ADDITIONAL OR PERFECT INFORMATION
   20  IS ALWAYS A BEST ESTIMATE.
   21  USE THE TUTORIAL SEERIES ON THE VALUE OF PERFECT
   22  INFORMATION.
```

```
SECTION #  4

QUESTION:
    1  WHAT IS THE COST OF POSTPONING THIS DECISION?

CORRECT ANSWER GROUP
    2  &&&

REPLY TO UNEXPECTED ANSWER:
    3  &&&

FAILURE MESSAGE:
    4  &&&

HINT # 1
    5  THE OPPORTUNITY COST IS THE COST OF FOREGOING YOUR
    6  NEXT BEST ALTERNATIVE.
    7  &&&
    8  &&&
    9  &&&


SECTION #  5

QUESTION:
    1  DO YOU WANT TO POSTPONE YOUR DECISION?

CORRECT ANSWER GROUP
    2  YES
    3  Y

REPLY FOR THIS GROUP:
    4  YOU SHOULD SCHEDULE A DEFINITE TIME IN THE FUTURE
    5  WHEN YOU WILL AGAIN CONSIDER THIS QUESTION.
    6  )))DECAID,15
    7  $$BRANCH- 91


WRONG ANSWER GROUP:

    8  NO
    9  N


WRONG ANSWER GROUP:

   10  ^
   11  NO
   12  N
   13  &&&

REPLY FOR THIS GROUP:
   14  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   15  $$BRANCH- 2

FAILURE MESSAGE:
   16  RESPOND YES OR NO.
```

```
HINT # 1
   17  &&&


SECTION #  6

QUESTION:
    1  WHAT WAS YOUR PREVIOUS DECISION?

CORRECT ANSWER GROUP
    2  &&&

REPLY FOR THIS GROUP:
    3  $$BRANCH- 8

REPLY TO UNEXPECTED ANSWER:
    4  $$BRANCH- 8

FAILURE MESSAGE:
    5  $$BRANCH- 8


SECTION #  7

QUESTION:
    1  (C7) HAVE OTHERS ANSWERED SIMILAR DECISION QUESTIONS?

CORRECT ANSWER GROUP
    2  YES
    3  Y

REPLY FOR THIS GROUP:
    4  $$BRANCH- 9


WRONG ANSWER GROUP:

    5  NO
    6  N

REPLY FOR THIS GROUP:
    7  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
    8  CAN YOU ANSWER YES OR NO?

FAILURE MESSAGE:
    9  PLEASE RESPOND YES OR NO.

HINT # 1
   10  &&&
   11  &&&


SECTION #  8

QUESTION:
    1  (C8) WHAT IS YOUR CURRENT EVALUATION OF THOSE DECISIONS?
    2       1        2        3        4        5
    3  VERY FAVORABLE                    VERY UNFAVORABLE
```

```
CORRECT ANSWER GROUP
    4  11
    5  1
    6  2
    7  FAVORABLE

REPLY FOR THIS GROUP:
    8  $$BRANCH- 12


WRONG ANSWER GROUP:

    9  3
   10  4
   11  5
   12  UNFAVORABLE

REPLY FOR THIS GROUP:
   13  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   14  $$BRANCH- 91

FAILURE MESSAGE:
   15  TYPE A NUMBER 1 - 5.


SECTION #  9

QUESTION:
    1  WHAT DECISION WAS MADE?

CORRECT ANSWER GROUP
    2  &&&

REPLY TO UNEXPECTED ANSWER:
    3  $$BRANCH- 10

FAILURE MESSAGE:
    4  $$BRANCH- 10


SECTION #  10

QUESTION:
    1  (C10) HOW EFFECTIVE WERE PAST DECISIONS?

CORRECT ANSWER GROUP
    2  1
    3  2
    4  3
    5  EFFECTIVE


WRONG ANSWER GROUP:

    6  4
    7  5
    8  NOTEFFECTIVE
    9  INEFFECTIVE
```

```
REPLY FOR THIS GROUP:
   10  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   11  USE A SCALE FROM 1 TO 5 WITH :  1 (VERY
   12  EFFECTIVE) ---  5 (INEFFECTIVE).

FAILURE MESSAGE:
   13  $$BRANCH- 91

HINT # 1
   14  EFFECTIVENESS IS A MEASURE WHICH INDICATES IF THE DECISION
   15  SATISFACTORILY RESOLVED THE INTENDED QUESTION.


SECTION #  11

QUESTION:
    1  HOW EFFICIENT WAS THE SOLUTION?
    2  1 (VERY EFFICIENT) 2  3   4    5  (VERY INEFFICIENT)

CORRECT ANSWER GROUP
    3  1
    4  2
    5  EFFICIENT


WRONG ANSWER GROUP:

    6  3
    7  4
    8  5
    9  INEFFICIENT

REPLY FOR THIS GROUP:
   10  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   11  $$BRANCH- 91

FAILURE MESSAGE:
   12  ENTER A NUMBER BETWEEN 1 AND 5.
   13  $$BRANCH- 11

HINT # 1
   14  &&&
   15  &&&
   16  &&&


SECTION #  12

QUESTION:
    1  DO YOU WANT TO SEARCH FOR NEW DECISION
    2  ALTERNATIVES?

CORRECT ANSWER GROUP
    3  YES
    4  Y
```

```
REPLY FOR THIS GROUP:
    5  $$BRANCH- 91


WRONG ANSWER GROUP:

    6  NO
    7  N

REPLY FOR THIS GROUP:
    8  )))DECAID,15
    9  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   10  $$BRANCH- 91

FAILURE MESSAGE:
   11  &&&


DESTINATION FILENAME= DECGOL
```

```
DEFIN2

10  FILES define.y104
20  DIM I[2],N$[70]
30  DIM N1$[70]
40  PRINT '20'7
50  PRINT "WHAT IS YOUR DECISION QUESTION?"
60  PRINT
70  ENTER #I
80  INPUT N$
90  N$=UPS$(N$)
100  IF N$="//HINT" THEN 260
110  IF N$="//STOP" THEN 290
120  IF  END #1 THEN 160
130  READ #1,I;I1,N1$
140  IF I <> I1 THEN 130
150  READ #1,1
160  IF  END #1 THEN 240
170  PRINT
180  PRINT "THE FOLLOWING INFORMATION IS STORED IN DECAID'S MEMORY."
190  PRINT
200  PRINT N$
210  PRINT #1,I;I,N$
220  CHAIN "*IDSF"
230  STOP
240  PRINT "NOTIFY YOUR PROCTER."
250  CHAIN "*IDSF"
260  PRINT "HINT IS NOT AVAILABLE."
270  PRINT
280  GOTO 50
290  END
```

GUIDE

```
10  ENTER 6,A0,A1
20  PRINT '20'7
30  PRINT "G U I D E"
40  PRINT
50  PRINT "WELCOME TO GUIDE.  THIS ROUTINE IN THE ALTERNATIVE"
60  PRINT "EVALUATION SECTION OF DECAID HELPS YOU ESTABLISH"
70  PRINT "GUIDELINES TO GOVERN YOUR DECISION MAKING."
80  PRINT
85  PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN GUIDE."
87  PRINT
88  PRINT "PLEASE CONSIDER AND THEN ANSWER ON ONE LINE THE FOLLOWING"
89  PRINT "GUIDE QUESTIONS."
90  ENTER 6,A0,A1
95  PRINT
100  PRINT '20'7
110  PRINT "1. WHAT RESOURCES ARE AVAILABLE FOR USE IN RESOLVING THIS"
120  PRINT "DECISION SITUATION?"
130  ENTER 255,C,C$
140  PRINT
150  PRINT "2. WHAT CONSTRAINTS ARE IMPOSED BY YOUR SUPERIORS, SUBORDINATES,"
160  PRINT "COMPETING INTEREST GROUPS,ETC. ON YOUR DECISION?"
170  ENTER 255,C,C$
180  PRINT
190  PRINT "3. WHAT TRADEOFFS ARE FEASIBLE?"
200  ENTER 255,C,C$
210  PRINT
220  PRINT "4. WHAT IS THE OPTIMUM TIMING FOR THIS DECISION?"
230  ENTER 255,C,C$
240  ENTER 15,A0,A1
250  PRINT '20'7
260  CHAIN "*IDSF"
270  END
```

IDEAS

```
5  DIM Z$[10]
10  ENTER 6,A0,A1
20  PRINT '20'7
30  PRINT "I D E A S"
40  PRINT
50  PRINT "YOU ARE ENTERING IDEAS, A ROUTINE IN QUEST."
60  PRINT "IDEAS ATTEMPTS TO HELP YOU AVOID THE ERROR OF"
70  PRINT "HAVING SOLVED THE WRONG PROBLEM REPRESENTATION,"
80  PRINT "WHEN YOU SHOULD HAVE SOLVED THE RIGHT PROBLEM,"
90  PRINT "CHOSEN THE RIGHT REPRESENTATION."
100  PRINT
110  PRINT "THIS ERROR IS CALLED THE ERROR OF THE THIRD KIND."
120  PRINT
130  PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN IDEAS."
140  PRINT "DO YOU WISH TO CONTINUE THE IDEAS ROUTINE?"
150  ENTER 60,A0,Z$
160  Z$=UPS$(Z$)
170  IF Z$="NO" THEN 450
180  IF Z$="N" THEN 450
190  PRINT
200  PRINT
```

```
210  PRINT "COMPLETE THE FOLLOWING STATEMENTS WITH REFERENCE"
220  PRINT "TO YOUR DECISION SITUATION."
230  PRINT
240  ENTER 6,A0,A1
250  PRINT '20'7
260  PRINT
270  PRINT "THERE IS USUALLY MORE THAN ONE WAY OF LOOKING AT A"
280  PRINT "QUESTION, IF I WERE A PSYCHOLOGIST I MIGHT DEFINE MY"
290  PRINT "SITUATION AS . . ."
300  ENTER 255,C,C$
310  PRINT
320  PRINT
330  PRINT "IN 10 YEARS WHEN I LOOK BACK ON THIS SITUATION I KNOW THAT"
340  PRINT "I WILL SAY MY DECISION QUESTION WAS ....."
350  ENTER 255,C,C$
360  PRINT
370  PRINT "IF A COULD TURN MY SITUATION AROUND, I KNOW THAT I WOULD"
380  PRINT "SAY THAT THE QUESTION IS . . . ."
390  ENTER 255,C,C$
400  PRINT '20'7
410  PRINT
420  PRINT "PUT ANOTHER WAY THIS SITUATION COULD BE LIKENED TO . . ."
430  ENTER 255,C,C$
440  PRINT '20'7
450  PRINT
460  CHAIN "*IDSF"
470  END
```

INTRO1

```
10  PRINT '20'7
20  PRINT
30  PRINT "DECAID IS A DECISION AID SYSTEM."
40  PRINT
50  PRINT "YOU WILL RESPOND TO DECAID QUESTIONS AND DECAID WILL COMMENT"
60  PRINT "ON YOUR ANSWERS AND INSTRUCT YOU IN THE FUNDAMENTALS OF THE"
70  PRINT "DECISION MAKING PROCESS."
80  PRINT
90  PRINT "DECAID OFTEN PAUSES AFTER DISPLAYING TEXT MATERIALS OR AFTER"
100  PRINT "READING INFORMATION YOU HAVE TYPED.  IF YOU FINISH READING THE"
110  PRINT "TEXT OR IN GENERAL WANT TO PROCEED, PRESS THE 'RETURN' KEY ON"
120  PRINT "RIGHT HAND SIDE OF YOUR TERMINAL KEYBOARD."
130  PRINT
140  PRINT "IF YOU WISH TO STOP USING DECAID BEFORE YOU COMPLETE A STANDARD"
150  PRINT "DECISION PROCESS SEQUENCE, YOU SHOULD TYPE //STOP IN RESPONSE"
160  PRINT "TO ANY DECAID QUESTION."
170  PRINT
180  PRINT "USE THE 'CONTROL H' CONVENTION FOR CORRECTING TYPING ERRORS."
190  PRINT "ASK A PROCTOR OR MONITOR IF YOU NEED HELP."
200  PRINT
205  ENTER 45,A,B
210  PRINT '20'7
220  CHAIN "*IDSF"
230  END
```

INTRO2

```
10  PRINT
20  PRINT '20'7
30  PRINT "AS YOU USE DECAID YOU MAY ISSUE THE FOLLOWING COMMANDS:"
40  PRINT
```

```
50  PRINT
60  PRINT SPA(5);"//STOP";SPA(15);"THIS COMMAND RETURNS CONTROL"
70  PRINT "OF YOUR WORK STATION TO EITHER THE INSTRUCTIONAL MANAGEMENT FACILITY (IMF)"
80  PRINT "OR THE HP OPERATING SYSTEM.  IF YOU HAVE A DECAID USER NUMBER"
90  PRINT "AND IF YOU ARE NOT USING THE TEST RUN MODE, WHEN YOU ISSUE THIS"
100  PRINT "COMMAND YOUR POSITION IN THE DECAID SEQUENCE WILL BE NOTED BY"
110  PRINT "THE IMF ADMINISTRATIVE PROGRAM.  THIS NOTE IN YOUR FILE ALLOWS"
120  PRINT "DECAID TO RETURN YOU TO THAT POINT IN THE SEQUENCE WHEN YOU "
130  PRINT "AGAIN SIGN ON THE DECAID SYSTEM."
140  PRINT
150  PRINT SPA(5);"//COMMENT";SPA(12);"ANYTHING YOU TYPE AFTER THE COMMENT"
160  PRINT "COMMAND IS STORED IN THE DECAID RESPONSE FILE.  USE THIS COMMAND"
170  PRINT "TO NOTIFY THE AUTHOR OF DECAID ABOUT PROBLEMS."
180  PRINT
190  PRINT SPA(5);"//HINT";SPA(15);"DECAID SUPPLIES QUOTATIONS,INSTRUCTIONAL"
200  PRINT "COMMENTS AND INTERPRETATIONS OF QUESTIONS IN RESPONSE TO THIS"
210  PRINT "COMMAND. IF A HINT HAS NOT BEEN STORED, THE MESSAGE 'NOT AVAILABLE'"
220  PRINT "IS DISPLAYED.  IF YOU BELIEVE A HINT IS NEEDED AT THAT POINT PLEASE"
230  PRINT "TYPE THE COMMENT COMMAND AND FOLLOW THAT WITH THE QUESTION IDENTIFIER"
240  PRINT "WHICH PRECEEDS THE QUESTION AND THEN TYPE THE PHRASE 'NEEDS HINT'."
250  PRINT
260  ENTER 45,A,B
270  PRINT '20'7
280  CHAIN "*IDSF"
290  END
```

PROBSL

```
10  PRINT "P  R  O  B  S  L"
20  ENTER 45,A0,A1
30  PRINT
40  PRINT '18'20'7
50  PRINT "BEFORE YOU CAN STATE YOUR DECISION QUESTION"
60  PRINT "YOU MUST CLARIFY THE SITUATION YOU ARE TRYING TO"
70  PRINT "RESOLVE.  YOU MUST TAKE INTO CONSIDERATION THE"
80  PRINT "CIRCUMSTANCES, FIND OUT WHAT'S WRONG, AND WHY IT'S"
90  PRINT "WRONG."
100  PRINT
110  PRINT "//HINT AND //STOP ARE NOT AVAILABLE IN PROBSL."
120  PRINT
130  PRINT "NOW, LET'S TRY TO DISCOVER THE CAUSE OF YOUR PROBLEM."
140  PRINT
150  PRINT "WHAT FACTORS HAVE BROUGHT IT ABOUT?"
160  PRINT
170  ENTER 60,A0,A1
180  PRINT
190  PRINT "WHY DOES IT PERSIST?"
200  PRINT
210  ENTER 60,A0,A1
220  PRINT
230  PRINT "WHAT FACTORS INTENSIFY THE DIFFICULTY?"
240  PRINT
250  ENTER 60,A0,A1
260  PRINT
270  PRINT "HAVE YOU BROKEN THE PROBLEM DOWN INTO COMPONENT"
280  PRINT "PARTS?"
290  PRINT
300  ENTER 60,A0,A1
310  PRINT
320  PRINT "WHAT PARTIES HAVE VESTED INTERESTS IN THIS SITUATION?"
```

```
340  PRINT
350  ENTER 60,A0,A1
360  PRINT
370  PRINT "WHAT STAKES DO OTHER PEOPLE HAVE IN HOW YOU RESOLVE"
380  PRINT "'THE PROBLEM'?"
390  ENTER 60,A0,A1
400  PRINT
410  PRINT "ARE THEIR DISCREPANCIES IN THE FACTS?"
420  PRINT
430  ENTER 60,A0,A1
440  PRINT
445  GOTO 480
450  PRINT "ARE THEIR VESTED INTERESTS INVOLVED?"
460  PRINT
470  ENTER 60,A0,A1
480  PRINT
490  PRINT "ARE ANY OF YOUR POLICIES OR PROCEDURES THE CAUSE"
500  PRINT "OF 'THE PROBLEM'?"
510  PRINT
520  ENTER 60,A0,A1
530  PRINT
540  PRINT "URIS (1970) PROVIDES A FINAL NOTE FOR THE"
550  PRINT "BEGINNING PROBLEM SOLVER.  HE STATES 'AVOID THE"
560  PRINT "BRASS TACKS URGE.  MANY EXECUTIVES LIKE TO"
570  PRINT "STRIKE DIRECTLY AT THE HEART OF THE MATTER. IN"
580  PRINT "SOME CASES THAT IS COMMENDABLE.  BUT IN DEALING"
590  PRINT "WITH PROBLEMS IT MAY LEAD TO 'SOLUTIONS' THAT"
600  PRINT "SOLVE NOTHING.'"
610  PRINT "MAKE CERTAIN YOU HAVE IDENTIFIED THE PROBLEM"
620  PRINT "CORRECTLY BEFORE YOU TRY TO SOLVE IT."
630  ENTER 60,A1,A0
640  PRINT
650  PRINT "ATTEMPT TO DETERMINE THE CAUSE OF YOUR PROBLEM."
660  PRINT "TYPE THE NUMBER 1 WHEN YOU ARE READY TO PROCEED."
670  INPUT Z
680  IF Z=1 THEN 700
690  GOTO 640
700  CHAIN "*IDSF"
710  END
```

QUEST3

```
5  DIM D$[1]
10  ENTER 6,A0,A1
20  PRINT '20'7
30  PRINT "Q U E S T"
40  PRINT
50  PRINT "YOU ARE ENTERING QUEST, THE DECISION DEFINITION PHASE"
60  PRINT "OF DECAID."
70  PRINT
80  ENTER 6,A0,A1
90  PRINT '20'7
100  PRINT "THE MOST COMMON SOURCE OF MISTAKES IN MANAGEMENT DECISIONS"
110  PRINT "IS THE EMPHASIS ON FINDING THE RIGHT ANSWER RATHER THAN ON"
120  PRINT "FINDING THE RIGHT QUESTION. THIS CAN CAUSE AN ERROR OF"
125  PRINT "THE THIRD KIND."
130  ENTER 10,A0,A1
500  DIM A$[80]
510  DIM C$[80]
520  ENTER 40,A0,A1
```

```
525  PRINT "NOW ATTEMPT TO CATEGORIZE YOUR DECISION SITUATION."
526  PRINT
540  PRINT "WHAT PHRASE BEST DESCRIBES THE SITUATION WHICH MOST"
550  PRINT "NEEDS CHANGING IN YOUR AREA OF RESPONSIBILITY?"
560  INPUT A$
570  A$=UPS$(A$)
571  IF A$="//HINT" THEN 576
572  IF A$="//STOP" THEN 730
573  GOTO 580
576  PRINT "EXAMPLES MIGHT INCLUDE 'SLOW PRODUCTION'  'HIGH COST' ETC."
577  PRINT
578  GOTO 540
580  PRINT
590  PRINT "ALTHOUGH ";A$;" MAY DESCRIBE YOUR SITUATION,"
600  PRINT "ANOTHER PHRASE OR WORD WHICH DESCRIBES THE SITUATION"
605  PRINT "WHICH MOST NEEDS CHANGING IS?"
610  PRINT
620  INPUT C$
630  C$=UPS$(C$)
631  IF C$="//HINT" THEN 637
632  IF C$="//STOP" THEN 730
633  GOTO 640
637  PRINT "PLEASE ATTEMPT TO REPHRASE OR RECONCEPTUALIZE YOUR"
638  PRINT "CATEGORIZATION OF YOUR DECISION SITUATION."
639  PRINT
640  PRINT
650  PRINT "YOU ARE FOCUSING YOUR ATTENTION ON IDENTIFYING THE"
660  PRINT "RIGHT QUESTION. THIS IS IMPORTANT."
670  PRINT
680  PRINT "YOU ENTERED THE FOLLOWING PHRASES."
681  PRINT "A",A$
682  PRINT "B",C$
683  PRINT
684  PRINT
686  PRINT
690  PRINT
700  ENTER 90,A0,A1
705  PRINT
720  CHAIN "*IDSF"
730  STOP
740  END
```

```
·REMEM

 10  FILES DEFINE.Y104
 20  DIM I[2],N$[70]
 30  DIM N1$[70]
 35  PRINT
 40  PRINT "REMEMBER YOUR DECISION QUESTION IS:"
 45  PRINT
 50  ENTER #I
 55  IF  END #1 THEN 110
 60  READ #1,I;I1,N1$
 80  PRINT N1$
 85  PRINT
 90  CHAIN "*idsf"
 100  STOP
 110  PRINT "NOTIFY THE PROCTER."
 115  CHAIN "*idsf"
 120  END
```

```
LESSON NAME =QUEST          VERSION NUMBER 77


CURRENT LESSON OPTIONS

ANSWER TYPE = STRING
NO TIMEOUTS TO BE USED

ALLOW DEMO?  YES
AUTO-UPSHIFT?  YES
REMOVE BLANKS?  YES
ALLOW //TSB?  YES
ALLOW //CALC?  YES
ALLOW //GOTO?  YES
AUTOMATIC QUESTION NUMBERS?  NO
REDISPLAY?  YES
TRIALS =   2
RESPONSE FILENAME=  QUEST1
STATISTICS FILENAME=  QUEST2
TIME =   180


SECTION #  1


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\quest3,10
    2  \\\\why1,10
    3  &&&
    4  &&&

QUESTION:
    5  (B1) NOW --- WHAT PHRASE OR WORD BEST DESCRIBES THE
    6  MAIN TOPIC OF INTEREST IN YOUR DECISION SITUATION?

CORRECT ANSWER GROUP
    7  #NO
    8  #KEY
    9  #DON'T#
   10  &&&

REPLY FOR THIS GROUP:
   11  &&&

CORRECT ANSWER GROUP
   12  &&&
   13  &&&

REPLY FOR THIS GROUP:
   14  $$BRANCH- 3

REPLY TO UNEXPECTED ANSWER:
   15  $$BRANCH- 3
```

```
FAILURE MESSAGE:
   16  PLEASE CONTINUE
   17  $$BRANCH- 3

HINT # 1
   18  THE KEY TERM IS PROBABLY A NOUN.  THE KEY TERM WILL BE A
   19  CLASS WORD WHICH CATEGORIZES YOUR PROBLEM OR OPPORTUNITY.

HINT # 2
   20  &&&


SECTION #  2


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  DO YOU WANT TO CONTINUE THE DECAID PROGRAM?

CORRECT ANSWER GROUP
    3  #Y
    4  #A
    5  &&&

REPLY FOR THIS GROUP:
    6  OK. TRY AGAIN.
    7  $$BRANCH- 1


WRONG ANSWER GROUP:

    8  #N
    9  NO
   10  &&&
   11  #

REPLY FOR THIS GROUP:
   12  )))decaid,13
   13  $$BRANCH- 91

REPLY TO UNEXPECTED ANSWER:
   14  PLEASE TYPE YES OR NO.
   15  $$BRANCH- 2

FAILURE MESSAGE:
   16  PLEASE TYPE YES OR NO.
   17  $$BRANCH- 2


SECTION #  3


SECTION OPTIONS:
    1  TRIALS =  1
       KEYWORD
```

```
TEXT:
    2  &&&
    3  &&&

QUESTION:
    4  (B3) HOW WOULD YOU DEFINE THIS PHRASE?

CORRECT ANSWER GROUP
    5  #N@@@#

REPLY FOR THIS GROUP:
    6  TRY TO DESCRIBE YOUR UNDERSTANDING OF THE
    7  DECISION SITUATION.
    8  $$BRANCH- 3


WRONG ANSWER GROUP:

    9  &&&
   10  &&&

REPLY FOR THIS GROUP:
   11  &&&

REPLY TO UNEXPECTED ANSWER:
   12  DEFINING IS DIFFICULT...LET'S CONTINUE.

FAILURE MESSAGE:
   13  UNDERSTANDING YOUR DECISON SITUATION IS ESSENTIAL IF YOU
   14  SEEK TO MAKE A RATIONAL DECISION.

HINT # 1
   15  MEANING IS OFTEN DIFFICULT TO CLARIFY AND EXPLAIN, BUT IT IS
   16  IMPORTANT THAT YOU CREATE A BOUNDARY FOR YOUR DECISION SITUATION.
   17  DEFINING YOUR KEY TERM HELPS CREATE A BOUNDARY FOR YOUR DECISION.


SECTION #  4


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  WORD CHOICE IS IMPORTANT WHEN YOU CREATE A DECISION
    2  QUESTION. ASK YOURSELF ABOUT THE IMPLICATIONS OF THE
    3  PHRASE YOU HAVE SELECTED.

QUESTION:
    4  (B4) ARE YOU CONFIDENT YOU HAVE APPROPRIATELY
    5  IDENTIFIED YOUR DECISION SITUATION?

CORRECT ANSWER GROUP
    6  #Y@@#
    7  #AFFIRM

REPLY FOR THIS GROUP:
    8  &&&
```

```
WRONG ANSWER GROUP:

    9  #N
   10  #S
   11  #WHAT

REPLY FOR THIS GROUP:
   12  &&&
   13  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   14  PLEASE TYPE YES OR NO.
   15  $$BRANCH- 4

FAILURE MESSAGE:
   16  PLEASE TYPE YES OR NO.
   17  B
   18  $$BRANCH- 4

HINT # 1
   19  CONNOTATION IS THE IMPLICATION A WORD STIMULATES.
   20  &&&

HINT # 2
   21  DENOTATION IS THE MEANING ASSOCIATED WITH A WORD.


SECTION #  5


SECTION OPTIONS:
    1  TRIALS =  2
    2  COUNTER =  3
       KEYWORD

TEXT:
    3  \\\\ideas,10
    4  &&&
    5  &&&

QUESTION:
    6  (B5) CAN YOU SPECIFY YOUR DECISION QUESTION?

CORRECT ANSWER GROUP
    7  #A
    8  #Y

REPLY FOR THIS GROUP:
    9  GOOD. IT IS IMPORTANT THAT YOU DO SO IN YOUR DECISION PROCESS.


WRONG ANSWER GROUP:

   10  #N

REPLY FOR THIS GROUP:
   11  YOU SHOULD TYPE //STOP.
   12  &&&
   13  &&&
```

```
WRONG ANSWER GROUP:

   14  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   15  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   16  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
   17  BRANCHING IS INCOMPLETE AT THIS POINT.
   18  $$BRANCH- 1

REPLY TO UNEXPECTED ANSWER:
   19  &&&

FAILURE MESSAGE:
   20  $$BRANCH- 1

HINT # 1
   21  &&&
   22  &&&


SECTION #  6


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  \\\\DEFIN2,10

QUESTION:
    3  (B6) IS YOUR DECISION QUESTION CORRECTLY ENTERED?
    4  &&&
    5  &&&

CORRECT ANSWER GROUP
    6  #N

REPLY FOR THIS GROUP:
    7  #^
    8  #N
    9  $$BRANCH- 6


WRONG ANSWER GROUP:

   10  #Y

REPLY FOR THIS GROUP:
   11  $$BRANCH- 7

REPLY TO UNEXPECTED ANSWER:
   12  $$BRANCH- 6

FAILURE MESSAGE:
   13  &&&
```

```
HINT # 1
   14  A DECISION QUESTION IS A CLEAR, CONCISE
   15  STATEMENT OF A PROBLEM OR AN OPPORTUNITY
   16  THAT MUST BE EVALUATED BEFORE ANY ACTION CAN BE TAKEN.


SECTION #  7


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  IS YOUR DECISION QUESTION WRITTEN FROM AN ORGANIZATIONAL
    3  PERSPECTIVE?

CORRECT ANSWER GROUP
    4  #Y
    5

REPLY FOR THIS GROUP:
    6  $$BRANCH- 8


WRONG ANSWER GROUP:

    7  #N
    8  &&&

REPLY FOR THIS GROUP:
    9  WELL, IT SHOULD BE.  PLEASE  REENTER YOUR DECISION QUESTION.
   10  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
   11  TYPE YES OR NO.
   12  $$BRANCH- 7

FAILURE MESSAGE:
   13  TYPE YES OR NO.
   14  $$BRANCH- 7

HINT # 1
   15  AN ORGANIZATIONAL PERSPECTIVE IMPLIES THAT THE
   16  QUESTION USES THE ORGANIZATION AS THE SUBJECT OF THE QUESTION.


SECTION #  8


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  EVALUATION OF WORD CHOICE
    2  FOCUSING ON WORD CHOICE M^AY CL^ARIFY YOUR SITUATION.
```

```
QUESTION:
    3  CAN YOU REPLACE ANY OF THE WORDS IN YOUR DECISION
    4  QUESTION WITH MORE CONCRETE WORDS?

CORRECT ANSWER GROUP
    5  #Y
    6  &&&
    7  &&&
    8  &&&

REPLY FOR THIS GROUP:
    9  $$BRANCH- 6


WRONG ANSWER GROUP:

   10  #N
   11  &&&

REPLY FOR THIS GROUP:
   12  $$BRANCH- 9

REPLY TO UNEXPECTED ANSWER:
   13  TYPE //HINT WHEN THE QUESTION IS
   14  REDISPLAYED, THEN TYPE EITHER YES OR NO.

FAILURE MESSAGE:
   15  CONTINUE ...

HINT # 1
   16  A CONCRETE WORD IS IN APPOSITION TO AN ABSTRACT WORD.  A CONCRETE
   17  WORD DEALS WITH OBJECTS, PLACES
   18  OR THINGS RATHER THAN WITH CONCEPTS.  CONCRETENESS IS IMPORTANT
   19  BUT DON'T SACRIFICE ACCURACY.


SECTION #  9


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  DOES YOUR DECISION QUESTION CONTAIN EMOTIVE OR LOADED WORDS?

CORRECT ANSWER GROUP
    4  #Y
    5  #A

REPLY FOR THIS GROUP:
    6  $$BRANCH- 11


WRONG ANSWER GROUP:

    7  #N
    8  &&&
```

```
REPLY FOR THIS GROUP:
    9  $$BRANCH- 10

REPLY TO UNEXPECTED ANSWER:
   10  &&&

FAILURE MESSAGE:
   11  FINE.

HINT # 1
   12  AN EMOTIVE WORD MAY INDICATE BIAS
   13  IN YOUR PERCETION OF YOUR DECISION QUESTION. ATTEMPT TO
   14  REPHRASE YOUR DECISION QUESTION.


SECTION #  10


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  EVALUATION OF STRUCTURE AND LOGIC

QUESTION:
    2  CAN YOU REPHRASE YOUR DECISION QUESTION IN AN INVERTED
    3  OR ALTERED SEQUENCE?

CORRECT ANSWER GROUP
    4  #Y
    5  #A
    6  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
    7  &&&         ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
    8  $$BRANCH- 11


WRONG ANSWER GROUP:

    9  #N
   10  &&&

REPLY FOR THIS GROUP:
   11  $$BRANCH- 12

REPLY TO UNEXPECTED ANSWER:
   12  TYPE YES OR NO.
   13  $$BRANCH- 10

FAILURE MESSAGE:
   14  CONTINUE...
   15  &&&
   16  $$BRANCH- 12

HINT # 1
   17  INVERTER WORD ORDER OR THE ADDITION OF A QUESTION WORD (WHO,ETC.)
   18  CAN CLARIFY THE DECISION QUESTION IN SOME INSTANCES.
```

```
SECTION #  11


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\defin2,10

QUESTION:
    2  (B11) IS YOUR DECISION QUESTION CORRECTLY ENTERED?

CORRECT ANSWER GROUP
    3  &&&

CORRECT ANSWER GROUP
    4  #Y
    5  #A
    6  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***

REPLY FOR THIS GROUP:
    7  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
    8  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
    9  $$BRANCH- 12

CORRECT ANSWER GROUP
   10  #N
   11  &&&
   12  &&&

REPLY FOR THIS GROUP:
   13  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   14  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
   15  $$BRANCH- 11

REPLY TO UNEXPECTED ANSWER:
   16  FINE. WE WILL PROCEED TO CHECKLIST NUMBER 2.

FAILURE MESSAGE:
   17  OK.

HINT # 1
   18  &&&


SECTION #  12


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  IS YOUR DECISION QUESTION SIMPLE AND DIRECT?

CORRECT ANSWER GROUP
    3  #Y
    4  #A
    5  &&&          ***  (NEW LINE ADDED BY UTILITIES PACKAGE)  ***
```

```
REPLY FOR THIS GROUP:
    6  $$BRANCH- 13


WRONG ANSWER GROUP:

    7  #N
    8  &&&

REPLY FOR THIS GROUP:
    9  PLEASE REENTER YOUR DECISION QUESTION.
   10  $$BRANCH- 11

REPLY TO UNEXPECTED ANSWER:
   11  AGAIN.
   12  $$BRANCH- 12

FAILURE MESSAGE:
   13  TYPE YES OR NO.
   14  $$BRANCH- 12

HINT # 1
   15  A SIMPLE AN DIRECT DECISION QUESTION WILL AID IN FURTHER ANALYSIS
   16  AND YOUR ABILITY TO DISTILL YOUR DECISION SITUATION TO A SIMPLE
   17  AND DIRECT QUESTION INDICATES GREATER
   18  COMPREHENSION OF THE DECISION SITUATION.


SECTION #  13


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&

QUESTION:
    2  IS YOUR DECISION QUESTION NARROW AND SPECIFIC?
    3  &&&

CORRECT ANSWER GROUP
    4  #Y
    5  #A

REPLY FOR THIS GROUP:
    6  FINE. YOU HAVE COMPLETED QUEST,A DIVERGENT PHASE IN DECAID.


WRONG ANSWER GROUP:

    7  #N
    8  &&&

REPLY FOR THIS GROUP:
    9  YOU MUST REEVALUATE YOUR USE OF DECAID.
   10  YOU HAVE DEFINED.
   11  $$BRANCH- 2

REPLY TO UNEXPECTED ANSWER:
   12  TYPE YES OR NO.
   13  $$BRANCH- 13
```

```
FAILURE MESSAGE:
   14  TYPE YES OR NO.
   15  $$BRANCH- 13

HINT # 1
   16  DOES YOUR QUESTION FOCUS ON A SINGLE OBJECT?


SECTION #  14


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  \\\\VRMYET,10
    2  &&&
    3  &&&
    4  &&&

QUESTION:
    5  ARE YOU PREPARED TO CONTINUE THE DECAID SEQUENCE?
    6  &&&

CORRECT ANSWER GROUP
    7  #Y
    8  #A
    9  #P

REPLY FOR THIS GROUP:
   10  FINE. YOU HAVE COMPLETED QUEST - A DIVERGENT PHASE
   11  IN DECAID AND YOU ARE BEING BRANCHED TO GOALS A
   12  SECOND DIVERGENT PHASE.  DON'T RESTRICT YOUR CONSIDERATIONS.
   13
   14  IN GOALS YOU SHOULD TAKE CARE TO AVOID PREMATURE CLOSURE.
   15  DON'T CLOSE ON A GOAL SET WITHOUT REALIZING THAT YOU MAY
   16  NEGLECT IMPORTANT GOALS.


WRONG ANSWER GROUP:

   17  #N
   18  &&&

REPLY FOR THIS GROUP:
   19  )))DECAID,13

REPLY TO UNEXPECTED ANSWER:
   20  PLEASE TYPE YES OR NO

FAILURE MESSAGE:
   21  PLEASE TYPE YES OR NO

HINT # 1
   22  &&&
   23  &&&
```

```
LESSON NAME =ROUTIN          VERSION NUMBER 84


CURRENT LESSON OPTIONS

 ANSWER TYPE = STRING
 NO TIMEOUTS TO BE USED

 ALLOW DEMO?  YES
 AUTO-UPSHIFT?  YES
 REMOVE BLANKS?  YES
 ALLOW //TSB?  YES
 ALLOW //CALC?  YES
 ALLOW //GOTO?  YES
 AUTOMATIC QUESTION NUMBERS?  NO
 REDISPLAY?  YES
 TRIALS =   2
 RESPONSE FILENAME=  ROUT1
 STATISTICS FILENAME=  ROUT2
 TIME =   180


 SECTION #  1


 SECTION OPTIONS:
        KEYWORD

 QUESTION:
     1  (E1) IS THIS DECISION QUESTION ROUTINE OR RECURRING?

 CORRECT ANSWER GROUP
     2  #YES#
     3  #AFFIRM
     4  #Y#
     5  #POSIT

 REPLY FOR THIS GROUP:
     6  REVIEW ALL APPLICABLE DECISIONS AND THEIR OUTCOMES.

 CORRECT ANSWER GROUP
     7  MAYBE
     8  #POSS
     9  #PROB

 REPLY FOR THIS GROUP:
    10  ATTEMPT TO LIST AND GENERALIZE SIMILAR PAST DECISION SITUATIONS.

 CORRECT ANSWER GROUP
    11  NO
    12  #NO
    13  #N#

 REPLY FOR THIS GROUP:
    14  $$BRANCH- 3

 REPLY TO UNEXPECTED ANSWER:
    15  YOU APPARENTLY MISUNDERSTOOD THE QUESTION OR YOUR
    16  ANSWER WAS NOT RECOGNIZED.
    17  $$BRANCH- 1
```

```
FAILURE MESSAGE:
   18  )))DECAID,11
   19  $$BRANCH- 91

HINT # 1
   20  THE DECISION LITERATURE SUGGESTS TWO·DECISION SITUATIONS
   21  WHICH ARE VARIOUSLY CALLED PROGRAMMABLE AND WICKED OR
   22  ROUTINE AND NONROUTINE.  THIS QUESTION HELPS YOU RECOGNIZE
   23  THE DISTINCTION AND ITS IMPLICATIONS.

HINT # 2
   24  &&&&
   25  &&&
   26  &&&


SECTION #  2


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  &&&
    2  &&&

QUESTION:
    3  ASSUMING THEN THAT THIS DECISION QUESTION IS
    4  A FAIRLY ROUTINE OCCURANCE -- ARE APPROPRIATE
    5  DECISION CRITERIA ESSENTIALLY DEFINED?

CORRECT ANSWER GROUP
    6  #Y#
    7  #YES#
    8  #AFFIR
    9  #POS

REPLY FOR THIS GROUP:
   10  &&&
   11  &&&
   12  $$BRANCH- 4

CORRECT ANSWER GROUP
   13  #MAYBE
   14  #POSSIB

REPLY FOR THIS GROUP:
   15  ATTEMPT TO CLARIFY DECISION CRITERIA.
   16  $$BRANCH- 4

CORRECT ANSWER GROUP
   17  #N#
   18  #NE
   19  #NO

REPLY FOR THIS GROUP:
   20  ATTEMPT TO DEFINE A SET OF DECISION CRITERIA.
   21  $$BRANCH- 4
```

```
WRONG ANSWER GROUP:

   22  &&&
   23  &&&

REPLY FOR THIS GROUP:
   24  &&&

REPLY TO UNEXPECTED ANSWER:
   25  &&&
   26  $$BRANCH- 1

FAILURE MESSAGE:
   27  )))DECAID,11
   28  $$BRANCH- 91

HINT # 1
   29  &&&
   30  &&&

HINT # 2
   31  &&&
   32  &&&
   33  &&&


SECTION #  3


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  DON'T JUMP TO CONCLUSIONS ABOUT YOUR DECISION QUESTION.

QUESTION:
    2  (E3) ARE YOU AWARE OF ANY ANALOGOUS DECISIONS SITUATIONS
    3  OR SIMILAR DECISION QUESTIONS?
    4  &&&
    5  &&&

CORRECT ANSWER GROUP
    6  #Y#
    7  #YES#
    8  #AFFIR
    9  #POSSIT

REPLY FOR THIS GROUP:
   10  ATTEMPT TO GENERALIZE FROM THAT ANALOGOUS SITUATION.
   11  CARE MUST BE EXERCISED AT THIS POINT.

CORRECT ANSWER GROUP
   12  #N#
   13  #NO
   14  #NE

REPLY FOR THIS GROUP:
   15  ASSUME THAT YOUR DECISION QUESTION IN NOT PROGRAMMABLE.
   16  $$BRANCH- 5
```

```
WRONG ANSWER GROUP:

   17  &&&
   18  &&&

REPLY FOR THIS GROUP:
   19  &&&
   20  $$BRANCH- 9


WRONG ANSWER GROUP:

   21  &&&
   22  &&&
   23  &&&

REPLY FOR THIS GROUP:
   24  &&&
   25  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
   26  WELL LET'S GO BACK.  WE WANT TO DETERMINE IF
   27  YOUR DECISION PROBLEM IS PROGRAMMABLE.
   28  $$BRANCH- 1

FAILURE MESSAGE:
   29  )))DECAID,15
   30  $$BRANCH- 91

HINT # 1
   31  &&&
   32  &&&

HINT # 2
   33  &&&
   34  &&&
   35  &&&


SECTION #  4


SECTION OPTIONS:
       KEYWORD

TEXT:
    1  ASSUME THAT YOUR DECISION PROBLEM IS PROGRAMMABLE.

QUESTION:
    2  &&&
    3  (E4) DO DECISION RULES OR MODELS EXIST WHICH
    4  CAN BE APPLIED TO SOLVE THIS DECISION QUESTION?

CORRECT ANSWER GROUP
    5  #Y#
    6  #YES#
    7  #POSSIT
    8  #AFFIR
```

```
REPLY FOR THIS GROUP:
    9  APPLY THE APPROPRIATE DECISION RULES OR MODELS.
   10  )))DECINF,10
   11  $$BRANCH- 91

CORRECT ANSWER GROUP
   12  #MAYBE#
   13  #DON'T KNOW#
   14  KNOW

REPLY FOR THIS GROUP:
   15  PLEASE CONSULT THE PROGRAM LIBRARY.
   16  $$BRANCH- 4

CORRECT ANSWER GROUP
   17  #N#
   18  #NO
   19  #NE

REPLY FOR THIS GROUP:
   20  YOU SHOULD CONSULT THE OPERATIONS RESEARCH DEPARTMENT.
   21  )))DECAID,15
   22  $$BRANCH- 91


WRONG ANSWER GROUP:

   23  &&&
   24  &&&

REPLY FOR THIS GROUP:
   25  &&&
   26  $$BRANCH- 6

REPLY TO UNEXPECTED ANSWER:
   27  DECAID WILL LOOP BACKWARD.
   28  $$BRANCH- 1

FAILURE MESSAGE:
   29  )))DECAID,11
   30  $$BRANCH- 91

HINT # 1
   31  &&&
   32  &&&

HINT # 2
   33  &&&
   34  &&&
   35  &&&


SECTION #  5


SECTION OPTIONS:
       KEYWORD
```

```
TEXT:
    1  &&&
    2  &&&
    3  &&&

QUESTION:
    4  HAVE YOU IDENTIFIED ANY SECONDARY DECISION QUESTIONS?

CORRECT ANSWER GROUP
    5  #Y#
    6  #YES#
    7  #POSI
    8  #AFFIR

REPLY FOR THIS GROUP:
    9  AFTER ANALYZING THE MAJOR DECISION QUESTION WHICH YOU HAVE
   10  SPECIFIED YOU MAY WISH TO INVESTIGATE OTHER QUESTIONS.
   11  )))DECGOL,1

CORRECT ANSWER GROUP
   12  #N#
   13  #NO
   14  #NE

REPLY FOR THIS GROUP:
   15  AS YOU PROCEED YOU MAY DISCOVER SECONDARY QUESTIONS.
   16  )))DECGOL,1
   17  WHICH ARE LINKED WITH THE CURRENT DECISION QUESTION.
   18  IF YOU DISCOVER SUCH SECONDARY QUESTIONS YOU MAY WISH TO
   19  USE DA TO HELP YOU ANALYZE THEM.


WRONG ANSWER GROUP:

   20  MAYBE
   21  &&&
   22  &&&
   23  &&&
   24  &&&

REPLY FOR THIS GROUP:
   25  GIVE THIS QUESTION MORE THOUGHT YOU MAY BE ABLE
   26  TO MAKE A CATEGORICAL YES OR NO STATEMENT.

REPLY TO UNEXPECTED ANSWER:
   27  GIVE THIS QUESTION MORE THOUGHT YOU MAY BE ABLE
   28  TO MAKE A CATEGORICAL YES OR NO STATEMENT.

FAILURE MESSAGE:
   29  TRY AGAIN -- IF YOU GET STUCK HERE TYPE //STOP
   30  $$BRANCH- 10

HINT # 1
   31  A SECONDARY QUESTION IS
   32  &&&
   33  &&&
   34  &&&

HINT # 2
   35  &&&


DESTINATION FILENAME= QUEST
```

WHY1

```
500  DIM A$[20]
510  DIM C$[80]
520  ENTER 40,A0,A1
530  PRINT '20'7
540  PRINT "WHAT PHRASE BEST DESCRIBES THE SITUATION WHICH MOST"
550  PRINT "NEEDS CHANGING IN YOUR AREA OF RESPONSIBILITY?"
560  INPUT A$
570  A$=UPS$(A$)
580  PRINT
590  PRINT "ALTHOUGH "$A$$" MAY DESCRIBE YOUR SITUATION,"
600  PRINT "ANOTHER PHRASE OR WORD WHICH DESCRIBES THE SITUATION"
605  PRINT "WHICH MOST NEEDS CHANGING IS?"
610  PRINT
620  INPUT C$
630  C$=UPS$(C$)
640  PRINT
650  PRINT "YOU ARE FOCUSING YOUR ATTENTION ON IDENTIFYING THE"
660  PRINT "RIGHT QUESTION. THIS IS IMPORTANT."
670  PRINT
680  PRINT "NOW, WHICH PHRASE BEST DESCRIBES YOUR DECISION SITUATION?"
681  PRINT A$
682  PRINT C$
683  PRINT
684  PRINT
690  PRINT
700  ENTER 90,A0,A1
710  PRINT "CONTINUING ...."
720  CHAIN "*IDSF"
730  STOP
740  END
```

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