ANTIFYING THE IMPACT OF THE ACQUISITION
PROFESSIONAL DEVELOPMENT PROGRAM
CERTIFICATION REQUIREMENTS ON THE AIR
FORCE INSTITUTE OF TECHNOLOGY

THESIS

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THESIS

Presented to the Faculty of the School of Engineering of the Air Force Institute of Technology Air University In Partial Fulfillment of the Requirements for the Degree of Masters of Science in Operations Research

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March 1992

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THESIS APPROVAL

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Preface

The purpose of this thesis was to develop a decision support tool to analyze the impact of the new training and educational requirements established by the Acquisition Professional Development Program on the Air Force Institute of Technology. The immediate needs of the simulation model contained in this research is to forecast the course demand of APDP courses taught by AFIT School of Systems and Logistics. This information will provide AFIT the necessary flexibility to adjust appropriately during the DOD-wide movement to increase the proficiency of the acquisition workforce.

Because of the genial approach used in emulating the APDP process, the model can easily be adapted to support acquisition manpower analysis efforts throughout the Air Force.

In performing the experimentation and writing this thesis I have had a great deal of help from others. I am deeply indebted to my thesis advisor, Major Kenneth Bauer and co-advisor, Lieutenant Colonel William Schneider. I could not have completed this research without invaluable lectures on SLAM offered by Major Bauer. Lt Col Schneider provided indispensable information to increase my understanding of the underlying policy and operations of APDP.

I would also like to thank Major Aaron Glover and the rest of the Head Quarters Air Force Material Command
provisional staff for consistently providing timely data and other critical APDP information.

Finally, I would like to thank my wonderful wife, Wendy, for her patience, prayers, and understanding throughout my graduate school experience. Without her tireless support, this endeavor would have been much more difficult and empty.
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Abstract

The purpose of this research is to determine the impact of implementing the Acquisition Professional Development Program on the Air Force Institute of Technology. APDP is part of a DOD-wide effort to decrease inefficiency in the procurement process. The program encompasses a tri-level certification process based on experience, training, and educational standards. APDP serves as a guideline for professional development of acquisition personnel from entry to senior level management. Many of the courses required for certification are offered through AFIT School of Systems and Logistics. Integrating the new educational requirements as a standard for career development is expected to produce a tremendous increase in AFIT course demands. It is the purpose of this research to analyze the acquisition workforce using the standards of APDP and determine the probable course demand facing AFIT School of Systems and Logistics.
I. Introduction

This research examines some of the impacts of congressional initiatives to enhance the efficiency of the procurement process. In particular, this thesis will examine those initiatives on improving the acquisition workforce and determine the impact of the newly imposed training and educational requirements for acquisition personnel on the Air Force Institute of Technology (AFIT).

Background

Throughout the evolution of military system's technology, it has been common place to the field of defense systems acquisition for some defense contractors to provide vital technology to government organizations at an unreasonably high cost. Discoveries of spare-parts, overpricing, poor quality, overruns, and excessive specifications of programs have fueled an already intense scrutiny and corresponding distrust of the defense acquisition community. Strict budget cuts in the Department of Defense (DoD), and the exponential growth of these scandals in both occurrence and cost, directed the attention of policy makers to the defense procurement process.
In 1989, the Secretary of Defense, Richard Cheney, was directed by the President to develop a plan to improve the procurement process. In Cheney's study of the acquisition workforce, he made the following observation:

The defense acquisition workforce mingles civilian and military expertise in many disciplines for management and staffing of the world's largest procurement organization. Each year billions of dollars are spent more or less efficiently, based on the competence and experience of these personnel. Yet, compared to its industry counterparts, this workforce is undertrained, underpaid, and inexperienced. Whatever other changes may be made, it is vitally important to enhance the quality of the defense acquisition workforce -- both by attracting qualified new personnel and by improving the training and motivation of current personnel. (4:13)

To meet the requirement for a more proficient defense acquisition workforce, Secretary Cheney established the Acquisition Professional Development Program (APDP). This idea is an evolutionary process extending from the Acquisition Management Professional Development Program (AMPDP) which focused on the educational requirements of program managers. The purpose of the APDP is to maximize job proficiency of personnel in the acquisition career field by implementing a distinct education and training certification plan throughout total career development. The program establishes minimum education, training, and experience requirements that are important for an individual's successful pursuit of senior responsibilities (5:7). The certification process divides into three levels corresponding to junior, middle, and senior
level management respectively. In accordance with the Defense Acquisition Workforce Improvement Act of 1990, the Acquisition Professional Development Program began implementation on 1 October 1991. Full scale implementation is not expected until after 1 October 1993. The program requires all personnel seeking new positions to be appropriately certified through the APDP process. Personnel occupying positions prior to program implementation will be allowed to maintain their current level of certification until a position change is required. (20:Sec. 1121-1301).

**General Issue**

As the technological needs of the Air Force continue to grow, so does the complexity of the contracts negotiated to obtain this technology. To help prevent government organizations from falling prey to profiteers and prevent the purchase of systems not capable of meeting the needs of the Air Force, the competence of the acquisition workforce must be increased. The career development approach of APDP strives to produce a workforce of proficient personnel that is equivalent to its industrial counterparts. Although civilian institutes will be instrumental in meeting some educational and training requirements necessary of the acquisition workforce, most of the responsibility rests upon the Air Force and other DoD educational institutions.
**Problem Statement**

The career development requirements of the acquisition workforce set by APDP demand a range of educational and training components such as professional military education, acquisition specialty courses, and advanced academic degrees (6:16). These certification requirements for existing personnel as well as new accessions to the acquisition career field will heavily tax DOD educational institutions in terms of resources required to increase student throughput and subsequent certification.

**Research Objective**

Although the multi-level certification process will impact many DoD educational and training organizations, it is the purpose of this thesis to quantify the impact of the APDP certification requirement for the Acquisition Logistics career specialty on the Air Force Institute of Technology (AFIT). In particular, this thesis will identify the amount of increase in training requirements necessary to certify the Acquisition Logistics personnel during the initial backlog and future steady state condition. Additionally, yearly training projections and a workforce profile will be accomplished using a twenty-eight year aging process. The aging process will employ a combination of life-cycle events such as promotions, attrition, and accessions and APDP events such as AFIT
training courses, certification screening, and position updates using the certification criteria. All life-cycle and APDP events will occur within the span of a calendar year and replicated over 28 years.

Sub-objectives

To solve this research problem, several key objectives were to be identified. Each of these objectives are explained in greater detail in the methodology sections of chapter 3.

Data Collection. Identify and sample the necessary data elements to model the process of APDP certification.

Acquisition Workforce. Identify the acquisition workforce in terms of position requirements and the population of people currently filling those positions.

Population Status. Identify the current level of certification for each person based on the certification level field in the individual's records and the associated educational history.

Backlog Training Requirements. Identify those persons in the acquisition workforce who are serving in positions which require a higher level of certification than that obtained by the occupant.

Current Capability. Identify all AFIT resources currently used to certify acquisition personnel. Identify the procedures used by AFIT to certify acquisition personnel at
each level of management and the associated number of students AFIT currently certifies through each process.

**AFIT APDP Training Contribution.** Identify the frequency and media of those courses taught by AFIT in support of APDP certification.

**New Training Requirement.** Identify the relevant range of the percent of the acquisition workforce expected to utilize AFIT resources for training. Assuming a uniform distribution of attendance over the given population percentage, identify the new training level dictated to AFIT based on student demand.

**Steady State Conditions.** The total impact of APDP certification requirements on AFIT must be computed under two conditions, backlog and steady state conditions. The backlog training conditions emerge from the population of people serving in positions above their certification level as of 1 October 1991. The long range impact or steady state condition is identified by finding the time line in which backlog requirements no longer dictate training levels and requirements are based solely upon personnel moving into positions based on accessions, promotions, and sufficient training.

**Research Approach**

The approach taken in this research effort was to undertake an extensive literature review that included the
structure of the acquisition workforce, laws and regulations forming the Acquisition Professional Development Program and a dissection of the efforts undertaken by Air Staff and other command head quarters to meet the requirements of APDP. The information gained in this review was scoped down to represent AFIT's role in improving the acquisition workforce. Once the problem had been totally defined and appropriately scoped, an analysis of AFIT's APDP role was accomplished using a discrete simulation model in Simulation Language for Alternative Modelling (SLAM). The model was constructed to emulate the demands placed on AFIT by the acquisition workforce due to the policies of APDP. The model encompassed twenty-eight years of replication to provide a confident projection of the backlog and steady state training requirements.
II. Literature Review

Introduction

This chapter provides a review of the literature on the educational and training problems arising from the acquisition professional development program certification requirements. The emphasis of this review is on an overview of the acquisition career field, the origin of the acquisition workforce certification requirement, and the different simulation approaches that can be used to analyze the problems arising from the certification requirement.

Overview of the Air Force Acquisition Career Field

Most narrowly defined, the acquisition workforce is comprised of only those who negotiate and administer contracts for major weapon systems. Broader definitions include activities occurring outside the contract process, such as documenting the need for a new weapon, testing systems under development, maintaining systems in the field, and disposing of outmoded or unnecessary equipment. A still more comprehensive perspective would encompass all those who procure the ordinary goods, such as office supplies and delivery vehicles, needed to support any large organization within DoD (12:104).

Air Force Regulation (AFR) 36-1 governs the officer specialty classification system. The Air Force classifies the
types of primary officer duties according to "utilization fields" or "specialties." Each officer job type is assigned a four-digit Duty Air Force Specialty Code (DAFSC). The first two digits represent the utilization field to which the officer is assigned. The third digit determines the officer's specialty while the fourth digit signifies the rank limitation.

Acquisition is defined by several DoD directives in the 5000 series. Pertinent to the research contained in this study, information will be extracted from *Systems Acquisition Management Careers* (5000.23), *Defense Acquisition Education, Training, and Career Development Program* (5000.52), and *Reporting Functional and Training-Related Data on DoD Military and Civilian Acquisition Personnel* (5000.55). Many utilization fields are associated with acquisition management. The fields include Program Director (0029), Program Management (27XX), Cost/Budget (67XX), Test Pilots/Navigators (286X/287X), Development Engineering (28XX), Communications-Computers Systems (49XX), Contracting/Manufacturing (65XX), and Logistics Plans and Programs (66XX). All of these personnel combine to structure the acquisition workforce. However, when referencing "acquisition manager," the term generally applies to officers in the 27XX career fields. Because of their critical role in the procurement process,
acquisition managers have been targeted as the prime source of efficiency improvement in the procurement process (11:1-81).

Origin of Certification Requirement

Outrageous prices for simple items of hardware are only the most obvious symptoms of deeper problems in management of military procurement. The Strategic Air command paid $982 for a nylon stool cap worth eighteen cents and only began to investigate the cost when it rose to $1,118 (3:12). General Dynamics billed the Air Force $9,606 for a twelve cent allen wrench. The Naval Department relieved an officer of duty because he contracted custom design ashtrays for $659 (20:14). Beyond contractor fraud permitted by contract negligence in the procurement process, budgetary waste also stems from contract over-specification and lack of quality control.

Aircraft refrigerators priced at $17,000 and coffee brewers for $7,600 appear not only because the items are produced in very small, inefficient lots, but also because the military requires that even such common equipment be built according to customized designs and with very high military specifications. Airline beverage-makers are available for about $3,000. Rather than settle for commercial equipment, the Air Force paid $7,600 for a coffee-brewer on the C-5A air transport. The brewer was the first of its kind, designed to work even if the plane lost all cabin pressure, and able to withstand forty gravities of acceleration, although the loss
of cabin pressure would force the plane down and forty times the force of gravity would kill all the passengers. In 1984, after spending $1.8 billion to develop the Division Air Defense Gun (DIVAD), the Pentagon belatedly canceled it because of test failures and poor reliability. (1:24). These examples of contract over specifications and lack of quality control are prime examples of the willingness of DoD officials to accept high technological risk in systems procurement at the expense of reliability, maintainability and affordability.

After completing an investigation of fraud against major defense contractors, "General Joseph Sherick revealed to a Congressional committee that forty-five of the nation's top 100 defense contractors were under some kind of criminal investigation for fraud. Later he supplied a list that revealed that eight of the top ten defense contractors were among those under investigation." After several years of adjudication, four fraud cases have been proven, two dismissed and two still pending (12:105).

The estimates are controversial, but they suggest that over the past four decades the nation may have lost tens, even hundreds, of billions of defense dollars to waste and inefficiency. Those losses are significant, relative to a total military budget now approaching $300 billion annually. Contractor fraud, contract over-specification, and lack of contract quality control are all prime contributors to the
vast losses suffered by the DoD budget (22:11). A common factor to each of these elements is the acquisition workforce.

In 1986, President Ronald Reagan assigned David Packard, former deputy secretary of defense 1969 - 1971 and president of Hewlett-Packard Company, to chair the Blue Ribbon Commission on Defense Management that became known as the Packard Commission. The purpose of the commission was to develop a plan to improve the defense procurement process and management of the Pentagon. In the report to the President, the Packard Commission defined two major issues on improving the procurement process. First, the defense acquisition system was identified as "a major contributor to the long delays in getting new technology in the field that builds formidable barriers to exploiting technology developed in the civilian sector" (4:26). The report further explained that while congress did not intend the system to be slow, cumbersome, and inefficient, laws passed to foster goals other than efficient procurement made it so (4:26). Secondly, the report pointed out that the acquisition workforce spent billions of dollars each year more or less efficiently, based on their competence and experience (4:12). The report concluded that despite what other congressional actions may be necessary to improve the procurement process, streamlining the acquisition process to delete cumbersome bureaucracy and
improving the competence of the acquisition workforce would be a prerequisite for improvement.

In accordance with the recommendations made by the Packard Commission, the 1987 Defense Authorization Act provided the Secretary of Defense the authority to realign agencies responsible for all stages of the procurement process (21:Sec. 1202). Continuing in his effort to enhance the procurement process, the Defense Authorization Act of 1991 called for the creation of the Defense Acquisition Workforce Improvement Act that established all the critical acquisition positions and programs necessary for producing a proficient workforce. To ensure that DoD-wide training, education, and career development policies concerning civilian and military acquisition personnel are developed and implemented effectively, the Acquisition Professional Development Program (APDP) was developed.

**APDP Implementation**. This program seeks to maximize the professional development and mission capability of the acquisition workforce by setting forth a definitive and viable professional development management plan that produces broad-based managers capable of assuming middle and senior management roles in support of acquisition (5:7). Intrisinc to the philosophy of the APDP is the fact that the Air Force acquisition system needs trained and experienced professional leaders at all levels to ensure mission success. The APDP
must produce acquisition managers with broad experience, yet with a common core of experience, training, education, and professional development. This mixture of qualifications must be achievable and is accomplished in part by providing opportunities for high-potential officers in related fields to transition into acquisition and encouraging operational broadening assignments for those officers who begin their careers in acquisition (5:5-14). This program became functional in October 1991, and set forth the requirement for all acquisition personnel to be certified according to their functional duties by October 1993 (21:Sec. 1735).

The certification function consists of an individual record screening process against education, training, and experience standards. The screening process provides a three level certification identifier which channels promising officers into jobs of high responsibility such as program director duty. Each level has specific requirements to ensure proper levels of academic and military education, specialty training, and acquisition-related experience. The three certification levels corresponding to basic, intermediate, and senior level management. The basic level is designed to establish fundamental qualifications and expertise in the individual's job series or career field. When individuals enter into a level one positions, they are expected to gain level one certification within eighteen months of their entry
into the job. For all other job levels, personnel are expected to obtain the necessary certification prior to entry into the position. Level one lays the foundation for career progression and is designed to prepare qualified, motivated personnel for positions of increasing responsibility (12:2-1). At this level, personnel are expected to gain widespread exposure to the different acquisition career fields. Hence, vast occurrences of crossover among people in different career stalls is expected of the population of level one personnel. The expected grade of personnel at this level range from second lieutenant to major. At level two, intermediate management, specialization is emphasized. Occurrences of crossover is minimized and tour length in individual career stalls is increased. The expected grade of personnel at this level range from captain to lieutenant colonel. At level three, senior management, career progression is highly specialized and advanced acquisition education and training become essential. By the time an individual reaches the senior levels of acquisition management, he or she should have completed all the mandatory training and education requirements to that level. Career advancement should have provided a pattern which maximized the individuals exposure to his functional area while still allowing for a breadth of knowledge across the entire acquisition process. The expected
grade at this level range from lieutenant colonel to high ranking generals (12:2.1-2.9).

The formal selection process of APDP permits the screening of certified acquisition managers and the identification of those with the greatest potential to assume senior acquisition duties. Four distinct screening points exists, one for each level of certification and one for entry into the acquisition corps. The acquisition corps consist of those level two and three officers capable of filling critical acquisition positions. Since each level of certification has both educational and experience requirements, job selection as well as educational accomplishments is a decisive element of career advancement. The building block structure of education, training, and experience requirements is the key element for the APDP goal to improve the proficiency of the acquisition workforce.

The APDP requirements on the DoD level will be implemented in accordance to the guidelines presented in DoD manual Career Development Program for Acquisition Personnel (5000.52M), and DoD Instruction Reporting Management Information on DoD Military and Civilian Acquisition Personnel and Positions (5000.55). Current Air Force guidelines for implementation of the requirements of APDP are expressed in AFR 36-27. DoD guidelines serve as a baseline requirement for APDP implementation.
Combined, 5000.52M and 5000.55 instruction provide all the necessary personnel and manpower information necessary for implementing the APDP. Instruction 5000.55 provides the necessary information within the DoD to establish a management information system capable of providing standardized information on acquisition positions and persons serving in acquisition positions. This document details each position and personnel record required to maintain information on the acquisition workforce. It contains the necessary instructions for submitting requests for APDP certification at each of the different levels, certification waiver request, and other forms necessary for the standardized flow of information on the acquisition workforce across the DoD community (11:2-13).

Manual 5000.52M establishes the guidelines for career development of all personnel serving in acquisition positions in the DoD. It also contains the educational, training, and experience standards for specific acquisition workforce position categories and career fields. Additionally, the manual provides guidelines for APDP certification along each of the distinct acquisition career paths (12:1.2-1.3).

Problem. The career development requirements of the acquisition workforce set by APDP demand a range of educational and training components such as professional military education, acquisition specialty courses, and advanced academic degrees (6:16). These certification
requirements for existing personnel as well as new accessions to the acquisition career field will heavily tax DOD educational institutions in terms of resources required to increase student throughput and subsequent certification. The problem is to determine the impact of backlog and increased steady state educational and training requirements arising from implementation of the APDP on AFIT.

Modelling the APDP Process

Problems similar to the APDP problem facing AFIT have been analyzed using decision support models such as, continuous simulation models with emphasis on finite capacity flow, discrete simulation models, and pattern simulation models using relational data bases. The relevance of each of these approaches to the problem defined in this research is discussed below.

Continuous Simulation Model. Simulation of this problem is analogous to a pipeline-flow problem (20:238). Envision an oil tanker dispensing fuel through a large pipe. The large pipe leads to several smaller pipe. The smaller pipes lead to a group of even smaller pipes. Each pipe in the system has a finite capacity flow. The existing configuration of pipes and valves is sufficient for unloading a single ship, but a new dock has been completed to enable two ships to unload simultaneously. The problem now facing the station manager is to decide which portions of the pipeline structure constrain
the station from meeting the demand of unloading an extra ship. Like the volume the new ship adds to the unloading station, the new certification requirements enforced by APDP creates a greater demand for courses taught by AFIT for certification at each level of management. Similar to the different areas of the pipeline, the maximum capacity of students AFIT can certify at each level of management is fixed by the institution current level of resources and methods of instruction. Using these fixed levels of input and output, the simulation model can find the resulting bottlenecks in the system and provide a time schedule on the amount of backlog that will result. Fixing the appropriate distributions for new accessions and promotions in the acquisition career field and dynamically adjusting the number of people AFIT can certify for each level of management will enable the simulation model to provide critical information on how much AFIT must adjust certification training at each level of management to account for the new demand. Using the required adjustments and the fixed cost of resources used during certification, the total impact on AFIT can be computed in dollar amounts. There are several major advantages to the above simulation approach to this problem. The first is the additional information provided on the distinct bottlenecks of certification at each level of management. Secondly, the simulation output provides the capability of dynamic
sensitivity analysis without repeating several experimental runs. Thirdly, time lines and histograms monitoring the flow of personnel through the AFIT certification process are available. Therefore without any further experimental runs, backlog and steady state training requirements can be analyzed. The final and most important advantage to this approach is the simplicity of the simulation model. Since the different levels of certification can be simulated and analyzed independently, changes to one section of the model during sensitivity analysis do not require changes to the entire flow environment of the model (2:904). The major disadvantage to this approach is that the APDP process is a collection of discrete events taking place throughout the year. The completion of each course at AFIT may cause an instantaneous jump in certification for a class of people. Hence, statistics on backlog depletion, APDP course demand and steady state training requirements could be inaccurate if the process were modelled continuously.

**Discrete Simulation Approach.** Because of the discrete events occurring in the APDP certification process, discrete event simulation appears to be a viable option. After close analysis of the APDP process, the problem can be formulated as events to analyze the initial population, conduct training during each year and APDP certification screening at the end of each year. Using discrete simulation, each APDP process
can be identified as a school event or end-of-year screening event. This approach would allow accurate reporting of the discrete statistics unavailable in the continuous simulation approach. Since some statistics are continuous, the use of time persistent functions can be used to accurately collect this information. Although many simulation languages provide the capability to accomplish discrete event modelling, only SLAM will be considered for this research. This is due solely to the placement of the SLAM course early in the Masters of Operation Research curriculum which negated any unnecessary learning curves during model building.

**Pattern Simulation Approach.** Compared to the finite capacity flow approach, pattern simulation using relational data bases is an advanced and more complex approach to the problem. Simply stated, this approach simulates the pattern of mandatory education and training required for a specific job from entry to the highest level of proficiency. This approach uses the hierarchical relationship capability of data base software to describe required training patterns for personnel in a given career field. The data base links the appropriate probabilities and statistics necessary to describe the movement of a person from the unqualified state of career entry to job proficiency at the highest level of management. This data base serves as an interactive input module to a simulation model to emulate personnel moving through career
In their recent efforts to evaluate the impact of policy changes in manpower, personnel, and training (MPT), the Air Force Manpower and Personnel Center (AFMPC) employed the concept of pattern simulation in their new training system. The new system, Training Decision System (TDS), is a computer-based decision support system used by AFMPC decision makers to model the flow of airmen through jobs in an Air Force occupation (8:4-11). TDS provides procedures for building data bases concerning the dynamic flow of people through jobs for both formal and on-the-job training (OJT). Furthermore, the TDS includes modeling and optimization capabilities that provide estimates of training quantities, costs, and capacities for both formal and OJT. Such capabilities allow the TDS to go beyond simply describing the current situation in a specialty (22:1). The TDS can model alternative scenarios which reflect possible policy options. This characteristic of TDS is called "what-If" scenario modeling (22:15). This modeling technique can be used to decide the necessary trade-off between formal, OJT, or correspondence training.

Using pattern simulation to solve the acquisition certification problem, it is necessary to build a data base that describes the educational and training path for personnel in the acquisition career field. This training pattern will serve as the control baseline for career progression in the
acquisition specialty. Incorporating the appropriate changes in career progression due to the implementation of APDP will provide the experimental what-if scenario. Running the TDS model for this alternate career pattern will analyze personnel career progression and provide estimates on training quantities, costs, and capacities associated with the career pattern change (22:1-6). Using the same cost model from the previous approach, the total impact on AFIT can be computed in terms of dollar amounts. Figure 2.1 illustrates the TDS operation-phase process. As may be seen, the TDS modeling process involves two major steps. First, inputs are made for the baseline and alternate utilization and training (U&T) patterns to be modeled. This involves data about the jobs and training courses—in particular, the transition probabilities for moving from job to job and from job to training course (22:3-4).

The second step involves estimating training resource requirements, costs, and capacities associated with the U&T pattern simulation completed in stage one. First, Training resource quantities are estimated to support the training quantities from the U&T pattern model; these include both labor (student and instructor) and nonlabor (e.g., training equipment) hour requirements. The training resource requirement estimates are the basis for both cost estimation and capacity analysis. Costs are estimated by applying cost
Figure 2.1 Training Decisions System Modeling Process
factors (e.g., salaries) to resource requirement estimates. Training capacities are analyzed by comparing resource quantities required to those available at representative training sites. The training capacity analysis provides an overall capacity estimate of the numbers of trainees who can be trained at a site. The capacity analysis also provides resource-by-resource statistics (22:4).

This approach clearly has many advantages over the previous approach. The major advantage is the capability to impose policy and regulation changes throughout career progression using a single experimental run. The capability to evaluate total career changes makes this approach more adaptable to the APDP certification problem. The second advantage of this approach is the flexibility provided by what-if modeling. This comprehensive model can be modified to numerous policy changes over many career fields. The grave disadvantage to this approach is the complexity of programming required to accomplish an analysis of the problem. The learning curves associated with reprogramming the TDS model, building the required relational database of acquisition personnel, and incorporating the new APDP policy are prohibitive.

Summary

The literature review detailed a history of USAF procurement lined with horror stories of unnecessary budgetary
waste totalling billions of dollars. The scrutiny of the weapon system acquisition process arising from these horror stories generated initiatives targeted at providing a seasoned, well-trained acquisition cadre. Such efforts are embodied in the work of the Packard Commission which concluded that to prevent inefficient government spending, the proficiency of all personnel involved in the procurement process would have to be certified according to their managerial duties. DoD adopted the recommendations of the Packard Commission and The Acquisition Professional Development Program was established to meet the necessity to improve the proficiency of the acquisition workforce. The APDP called for a tri-level certification process based on increased experience, training and education requirements for all people in the acquisition workforce. These certification requirements for existing personnel as well as new accessions to the acquisition career field will greatly increase the demand for educational requirements from DOD educational institutions in terms of resources required to increase student throughput and subsequent certification. In particular, the demand placed on courses taught by AFIT will be substantially increased. The impact, if any, caused by this new demand for courses to support APDP needs to be determined. Simulation models with emphasis on flow capacities and employing data base training patterns were
analyzed as decision support systems to aide decision makers in finding the impact of the certification requirement on AFIT. Analyzing the problem through the use of continuous simulation provides a simplistic approach but does not provide a comprehensive view of total career progression. Although Pattern Simulations using relational data bases provide all the necessary tools for analyzing the problem, the complexity of the model may reduce its utility. Further analysis of the discrete process undertaken in APDP certification process identified discrete simulation modelling using SLAM as the most viable option for analyzing the problem.
III. Methodology

Introduction

This chapter presents the methodology used in completing the objectives outlined in Chapter I. The first section discusses the exploratory study done to understand the Acquisition Professional Development Program (APDP) and the role AFIT plays in the certification process. The second section explains data collection and the development of each research objective necessary to construct a simulation model. Since information contained in this section will be augmented with Chapter IV, Model Formulation, model discussion in this chapter will be limited to the construction of the research objectives as a simulation model. Model assumptions and functionality will be discussed in the next chapter.

Exploratory Study

The problem of determining the impact of APDP requirements on AFIT originated in AFIT School of Systems and Logistics. The School of Systems and Logistics is responsible for many of the core and specialty courses necessary for APDP certification. Prior to the implementation of the current APDP, specialized education and training requirements were limited to only a few of the acquisition career fields operating in the procurement process. The APDP, designed to increase proficiency of the entire acquisition
workforce, set minimal educational standards across the entire spectrum of acquisition career fields. Realizing that resources required for student throughput was already nearing its maximum, Lieutenant Colonel William Schneider spearheaded the effort to determine the impact of these new requirements on AFIT's operations. He solicited support in analyzing this problem from AFIT School of Engineering, Operations Research Department. Under his guidance, a series of trips were made to scope this DoD-wide movement down to the role of AFIT.

Because of their experience with the original certification program, Acquisition Management Professional Development Program (AMPDP) and their recent efforts to predict APDP impact on systems command, a trip was made to Headquarters Systems Command, Andrews Air Force Base. Captain Daniel Gerrig was the action officer for assistance in the research efforts. Captain Gerrig presented a briefing on the processes of APDP and provided vital liaison to manpower analysis offices at the Air Staff level. Captain Gerrig had recently completed a spreadsheet model used to identify APDP training requirements, which provide rough estimates of the course demand for Introduction to Acquisition Management (SYS100), Acquisition Planning and Analysis (SYS200), and Advanced Program Management (SYS400). The population of this model was limited to systems command officers in Duty Air Force Specialty Codes (DAFSC) of 26XX, 27XX, and 28XX. The
model employed rates for training, promotion, retention, and accession to age the population and predict training demand. The model predicted that the backlog training for SYS100 in systems command would diminish by 1991 and steady state training capability would be equal to demand by 1992. The model also predicted the demand for SYS200 and SYS400 in systems command could not be adequately supported by the current training capability. Hence identifying these courses as the "choke points" of APDP certification in the future years. In the briefings presented on his model, he identified the need to validate the results of this model and build an improved model that would extend his efforts to a total Air Force level. In addition to other requirements, this research is designed to encompass that goal.

Following the guidance of Captain Gerrig, Captains John Garstka and Michael Grant of the Pentagon USAF/DPXA manpower analysis directorate, were contacted. Captain Grant provided briefings on the process of manpower modelling and force analysis. He demonstrated several Simscript models and pointed out some key elements of manpower simulations. These elements will be discussed in detail in the next chapter on model formulation. Captain Garstka is the project officer for an eighteen month contract to SRA corporation to assess the feasibility of developing a policy management model to support Air Force acquisition force career development under the terms
of the Defense Acquisition Workforce Improvement Act (DAWIA) and APDP. Additionally, the contract employs SRA to develop a Decision Support System to be used by the Secretary of the Air Force Acquisition, (SAF/AQ) in managing the Air Force acquisition workforce. The contract is scheduled to be complete early 1993. Because of the experience he gained from working APDP through the SRA contract, Captain Garstka was instrumental in identifying some of the key data elements necessary for an APDP simulation model. He explained the process in five stages: procurement, education, training, utilization, and the retirement/separation stages. Figure 3.1 demonstrates the relationship of these stages and several common factors of each stage that must be considered when modelling manpower and the influences of policy. AFIT's role is captured in the educational and training blocks of this diagram.

The procurement stage represent the management of new accessions and existing personnel in the acquisition workforce. There are three major goals here. The first is to identify the existing population of people in the acquisition workforce. Next, the current certification status and educational deficiencies of these people must be determined. Finally, population rates such as promotion, training, accessions, and attrition must be identified. This stage identifies a "snap shot" of the acquisition workforce and
Modeling APDP Processes

![Diagram showing APDP processes]

Figure 3.1
prepares it for the aging process during simulation.

The next two stages capture AFIT's primary role in the APDP process. AFIT's APDP function is to provide acquisition personnel the necessary educational and training courses required for job proficiency. At a minimum, this task entails determining the needs of the acquisition community and maintaining course materials which reflect those needs.

The utilization stage represents the cycle of personnel being educated, trained, and utilized at each level of certification throughout career development. The final stage, retire and separate, represent two cycles of events in the acquisition community. The first cycle refers to the employment of retired or separated military personnel as civilian employees. When this occurs, knowledge and experience is retained in the acquisition workforce. The second cycle represents the opening of jobs for forward progression opportunity and thus new accessions when people retire or separate. This cycle is represented by the line in Figure 3.1 from the retire/separation block to procurement block. Although each of the common factors listed in the diagram can be associated with a particular stage in the acquisition personnel life-cycle, the influences of these factors are actually common to each stage. The common factors of people and requirements can be combined to represent the student population requiring AFIT courses for APDP.
certification. The common factors of money and constraints can be combined here to represent the necessary resources required by AFIT to provide the requirement of APDP courses to the acquisition workforce. Policy represents the influence of DAWIA and APDP on all acquisition personnel. It also captures AFIT's policy on course frequency, course content, and other Air Force regulations governing the training and educational process. The information gained from Captains Michael Grant and John Garstka was critical in diagramming the high level processes of APDP as a simulation model. The next step was collecting the data which enabled modelling each of the stages listed above.

Development of Research Objectives

Data Collection. Since this research is centered around the structure of the acquisition workforce in terms of positions and personnel, a trip to the military and civilian manpower and personnel centers was necessary to accomplish this objective. Although the simulation model constructed in this research is limited to military personnel certified according to the standards of the Acquisition Logistics career field, the development of the research model encompassed all acquisition career fields and both the military and civilian populations. At the Air Force Manpower and Personnel Center manpower analysis shop (AFMPC/DPMYA), Major Glenn Bailey acted as the action officer for all research simulation efforts.
Major Bailey is currently a rated force analyst and performs manpower analysis on problems similar to that of the APDP certification problem. Mrs. Barbara Smith, Chief of System Developmental Analysis (AFMPC/DPMRS), was also heavily involved in the research. Mrs. Smith served as a focal point for identifying the location of all APDP data elements in the military manpower and personnel files. A listing of the required data elements and their associated simulation attributes can be found in Appendix A. Using their combined expertise, several extractions were made from the manpower and personnel databases to obtain the necessary APDP data used for the simulation model. A sample of this data can be found in Appendix B. Since both the military and civilian population compete for the same course quotas at AFIT, the population size and certification demands of the civilian population affect the rate of certification for military personnel. To accurately model the military training process, the reduction in training rate due to the influence of civilian personnel had to be included. The Air Force Civilian Personnel Management Center systems requirement shop (AFCPMC/DPCIR) provided all critical statistics on the civilian population.

**Acquisition Workforce.** This objective requires a file containing the attributes of all military acquisition workforce positions and the people filling those positions. Additionally, population totals and critical rates must be
collected for the civilian acquisition population. This objective requires dissecting the workforce into its various population components. There are two populations, the military and civilian populations. Each population has two components, positions and personnel, which are maintained in separate data base files. Position files will be referred to as the manpower database and personnel files will be referred to as the personnel database. Each position component refers to a mission requirement and has attributes (characteristics) of the job necessary to support that mission requirement. Examples of position attributes are rank, acquisition position type, and acquisition career field type. The personnel component refer to an individual and consist of attributes listing the individual's qualifications and accomplishments. Such examples of personnel attributes are rank, years of service, and educational history. The military and civilian centers have unique methods of tracking the manpower and personnel attributes of the acquisition workforce. As a result of APDP implementation, DoD Instruction 5000.55 provides new directions governing the standardized tracking of all acquisition manpower and personnel information. Since this research must be completed prior to the necessary software changes to implement the standards of 5000.55, the interim methods of obtaining this data will be discussed. The military acquisition workforce identifies its position
omponent using a combination of two methods. The first method of identification is to augment each acquisition position with a "H" prefix. Since some positions already have designated prefixes, a second method had to be utilized. The second method used the Required Language (RLA) field of each position to code the acquisition position type and acquisition career stall. After all military positions were identified, similar attributes in the personnel file were used to identify the population of people. Two files containing all records of positions and personnel were compiled. Now that the positions and personnel were identified, the task at hand was to match the person to the appropriate position. Using the position number, which is identical in both files, a fortran sort program was employed to match people to their associated position. Since civilian manpower and personnel files can be extracted simultaneously, statistics on the position also provides statistics on the personnel. The civilian personnel system employs the functional job class code to track members of the acquisition workforce. This data entry is equivalent to the information contained in the RLA field of the military system. All statistics concerning the civilian acquisition workforce were obtained by a database query using this field. No specific data records were extracted for civilian personnel, only statistics on population totals and population rates such as attrition and accession.
Population Status. The objective here is to determine the certification status of each person in the military acquisition workforce. This status will be used to compute the population of people certified at the different levels of certification. Unless an individual has obtained a level three certification, a list of course deficiencies necessary to get level three certification will be maintained. This information will be used to compute the initial and expected course demands for each year during the aging process. This objective contains two parts. Part one involves determining the current certification level of each person and part two generates an evaluated certification level for each person in the military acquisition workforce. Since each personnel record has a data field which reports the current certification level, part one consists only of reading each file and the associated certification level field. Under the APDP program, certification consists of training, experience, and education. Relative to AFIT's role to provide education to the acquisition workforce, certification consists only of completing the required courses. Hence, each person's educational history is searched for acquisition courses completed. A temporary file of credit for each course completed towards certification at the different level is maintained. After the search is complete and all credits given, an evaluated certification level is assigned based
solely upon courses taken. For example, if an individual is certified at level one and has taken the necessary courses to be certified at level three, but lacks the necessary experience for the certification, his records will report only a level one. The evaluated level of certification will be level three. This assumption is valid since this person no longer require APDP courses at AFIT, and should not be consider a part of the demand population. One of the critical elements of determining the evaluated certification is compiling a master list of acquisition courses that could possibly appear in an individual's educational history. Once this list has been constructed, the appropriate credit must be applied under the new APDP program. In essence, the equivalence of the historic courses must be determined in order to provide accurate credit under the new certification system. This milestone requires a detailed review of historic acquisition courses occurring in Air Force Regulation (AFR) 50-5. This regulation contains a listing of the course codes for all credited courses that could be maintained in a person's educational history.

**Backlog Training Requirements.** The objective here is to divide the acquisition workforce into two populations. One population consist of individuals requiring on-time certification training. The remaining portion is the backlog population. There are two ways to become a member of the
backlog population. The first is those people who, as of 1 October 1991, were in positions which required a certification level higher than the one currently obtained by the individual in the position. This portion of the backlog population only decreases over the aging process. The second way to become a member of the backlog population is through accessions. This only applies to those lieutenants who were accessed into positions requiring a level one certification and after eighteen months, the certification has not been obtained. This entry criteria could allow personnel to be introduced into the backlog population throughout the simulation process. Since APDP regulations only allow people to move into positions in which they are already certified to hold (new lieutenants are the only exceptions), once a member leaves the backlog population, return is not possible. A member leaves backlog status by obtaining the certification level required by his position. Continuous monitoring of the backlog population is a critical statistic in determining the onset of steady state training conditions.

**AFIT APDP Training Contribution.** To determine the impact APDP has on AFIT, the contributions AFIT makes to the program must first be determined. Through a review of the course schedules of the School of Systems and Logistics in conjunction with a review of APDP certification requirements in AFR 36-27, it was found that AFIT offers over 75 different
courses that could be credited toward certification. Additionally, AFIT's SYS100, SYS200, SYS225 and SYS400 exists as one the primary sequences of achieving levels one and two certification. The wide spectrum of specialty courses taught by AFIT in support of APDP also increase the probability of acquisition workforce personnel attending AFIT.

**Current Capability.** This requirement is to identify the different modes in which an individual could be credited a course offered by AFIT. Some courses are offered by several modes such as correspondence, in-residence, total course credit examination, and/or on-site facilitator. In addition to determining the different modes, the expected number of students per course offering for a given mode is also needed. Both portions of this objective were estimated using historical data provided by the School of Systems and Logistics administrative office, AFIT/LSA. This research assumes yearly replication of training modes per course. Capacity per mode is an input variable to the simulation and will be varied during output analysis.

**New Training Requirement.** The purpose of this objective is to identify a percentage range of the acquisition population that will utilize AFIT for APDP certification. Many of the courses required for certification have equivalencies which are offered at different DoD institutions. Since there is no true way to find the exact percentage of the
population which will attend AFIT, minimum and maximum bounds on the population are calculated. The maximum bound assumes that every person seeking certification during the aging process will utilize AFIT resources. The minimum bound assumes an equal probability of attendance between the different institutions which offer a particular course. To calculate the minimum bound, the number of course equivalencies must be established. This information was obtained for the APDP Educational and Training subpanel. The Educational and Training subpanel is responsible for all issues concerning educating the acquisition workforce. Using the information provided by this subpanel, a uniform distribution is used for each person requiring a particular course to channel AFIT its portion of the course population. For example, if 100 people required SYS100, and there are 5 agencies which offer equivalent courses, 20 students would be channeled to AFIT. After the initial calculations using the minimum and maximum populations have been computed, sensitivity analysis will be conducted to monitor the course demand behavior between the minimum and maximum bounds.

**Steady State Conditions.** The purpose of this objective is to determine the time frame in which the initial backlog training demand ends and steady state training begin. At the end of each simulation year, a simulation event emulating the certification screening process is performed. A check is made
for each individual to determine if that person has obtained the required certification of his position. If so, the person is removed from the backlog population. Similar checks are made after eighteen months for new accessions. Closely monitoring the backlog population will provide the time line for the onset of steady state on-time training. This assumes that steady state can be reached with AFIT's current methods of instruction and level of resources. If steady state conditions cannot be obtained, this will also be identified in the analysis of the backlog population.

Summary

This research encompasses a DoD-wide movement to increase the job proficiency of the acquisition workforce. The focus of the movement is education, training, and experience. One of AFIT's many roles in support of the APDP is to provide educational support to the acquisition community. Because of the numerous agencies involved in implementing the APDP, several trips had to be made to formulate and quantify the objectives necessary to complete this research. Agencies such as HQ USAF, HQ AFMPC, HQ AFSC, and others were all integral parts in formulating this research. Now that the methods used to achieve each critical milestone of this research have been explained, the simulation model used to analyze the APDP process will now be discussed.
IV. Model Formulation

Introduction

This chapter outlines the construction of the SLAM simulation model used to analyze the impact of APDP certification requirements on AFIT. The first section discusses the assumptions of the model. The remaining sections discuss the slam and fortran modules used in the simulation model. The emphasis of this chapter will be placed on the logic used in the simulation model to emulate the APDP process. This discussion will explain the function of the model by detailing each fortran subroutine and major slam function.

Model Assumptions

No Population Cross Flow. Since the goal of APDP is to groom an acquisition workforce of educated, trained, and experienced personnel, job assignments to non-acquisition positions are not likely. The new pipeline structure of the acquisition workforce encourages cross flow within the different acquisition career fields, but does not foster career broadening outside the realm of acquisition. Hence, this model assumes all accessions will arrive as new lieutenants and no attrition will be suffered from total career cross flow.
**Input Data.** The simulation model utilizes a "snap shot" view of the Air Force since the data retrieved only represents that moment in time. This model assumes that the data extracted from the Air Force manpower and personnel databases is correct. Extensive error checking on each data field was included in the fortran routines to protect against invalid range or type data. However, erroneous data entries of the correct type and relevant range are assumed to be correct. For example, the rank data entry "3LT" for "2LT" would be identified as bad data and written to file stating the position, line, and data element of the error. Nonetheless, the rank data entry "CAPT" for "MAJ" would be accepted as a valid data entry.

**Training Priority.** During the first few years of the APDP implementation, the backlog training requirements are expected to cause an above average demand for AFIT courses. This model assumes that those people in the backlog population will be given priority selection for courses over on-time trainees. Furthermore, the backlog and on-time personnel files will be further prioritized by rank. This assumption is based on the time restrictions placed on backlog personnel to obtain the required certification. Although personnel wishing to remain permanently in their current position are not affected, the regular movement of military personnel ensures a large percentage of the backlog will seek an accelerated
avenue to gain the required certification. Since APDP has imposed this requirement, course selection officials within individual units must provide a realistic opportunity for backlog personnel to obtain the necessary courses. The priority scheme utilized by the simulation model provides that opportunity.

**Certification Requirement.** Under the requirements of APDP, each acquisition career field has specific standards for personnel certification. This model prototypes the APDP process and assumes all people will be certified identically under the guidelines of the Acquisition Logistics career field. To make this model more accurate, specific requirements for each career stall need to be implemented. Hence all persons will be certified according to their associated career field. This effort is listed as one of the continued research recommendations.

**Model Formulation**

The SLAM simulation model used in this research is purely discrete event. With the exception of the initialization process, all process in the model can be categorized as "school events" or "end-of-year events." This model uses extensive FORTRAN code (See Appendix C) to accomplish each event. To maintain a logical order in the presentation of the model formulation, Pritsker's ten stages of The Simulation Process will be used (18:10-11). They are as follows:

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1. Problem Formulation
2. Model Building
3. Data Acquisition
4. Model Translation
5. Verification
6. Validation
7. Strategic and Tactical Planning
8. Experimentation
9. Analysis of Results
10. Implementation and Documentation

Although some of these steps were discussed in other chapters, a brief synopsis will be provided again in this section to maintain a logical flow.

**Problem Formulation.** The new training and educational requirements for certification in the APDP will increase the demand for many AFIT courses. To prepare for the new wave of requirements, AFIT has initiated this research to analyze the APDP course demand and its impact. After visits to several headquarters Air Force organizations, it was determined that this problem could be analyzed using a discrete simulation model to emulate the process of APDP. The problem consist of preparing an initial population representative of the acquisition workforce, determining and implementing the policy of training and personnel advancement each year, and aging the population over a twenty-eight year expected life cycle of a military person.

**Model Building.** Major Glen Bailey of HQ AFMPC/DPMYA, aided immensely in determining the relationship between the data maintained on the acquisition workforce and the APDP processes requiring simulation. The relationships are
graphically expressed in Figures 4.1 and 4.2. Figure 4.1 defines the preprocessing of data necessary to initialize the SLAM model. As mentioned earlier, the acquisition workforce consists of two major populations, a population of positions and a population of people. The first stage is to identify the positions. Using the position number attribute of the position, the personnel can be matched to their associated positions. The combination of these populations construct the "snap shot" image of the acquisition workforce. This population is then broken down into two components, the SLAM entities and an auxiliary attribute matrix. The SLAM entity file provide the initial input to the simulation model. Each individual in the workforce is placed in the appropriate position of Figure 4.2 for the start of the simulation. Additionally, initial statistics are captured such as population totals, certification level totals, position totals, and other critical inputs. The auxiliary attribute matrix is used to enhance file manipulation and locations of entities in the system. It represents an external organization such as AFMPC which may require a copy of an individual's records for review. During special events such as promotions, attrition, etc., this matrix is used and then the entity is located in the system for removal or update.

The second diagram, Figure 4.2, represents the flow of personnel throughout their career development. All accessions
Data Flow Diagram

Personnel Data

Position Data

Acquisition Workforce

SLAM Entity File

Auxillary Attribute Matrix

SIMULATION MODEL

Figure 4.1
APDP Simulated Processes

Figure 4.2
are directed to level one positions. Each level has a two-way path to AFIT for training. Throughout the year, personnel attend AFIT for certification courses and are returned to their work positions. At the end of the year, personnel certified for new levels may be moved to a position at the next higher level. As mandated by APDP, only levels two and three personnel are eligible to enter the acquisition corps. Other criteria such as rank, and experience are also required for corps entry. This model only accounts for educational and rank requirements. Also mandated by APDP, only corps members are eligible to serve in critical acquisition positions. These positions are considered to have the highest level of responsibility and require the most promising individuals of the acquisition corps.

Other than training TDYs to AFIT, no entity movement occurs until the end of the year. At that time, all APDP screening processes are conducted, attrition, promotions, and aging occurs. The workforce is then emptied back into the workforce file as displayed earlier in Figure 4.1. End of year statistics are collected and educational certification requirements evaluated. This stage closes the loop for the aging process during career development.

Data Acquisition. As mentioned in the previous chapter, all data was collected from HQ AFMPC. Fortran programs were written to convert character data to integer categories and to
filter out bad data. Erroneous data having entries in the relevant range of the data field, are considered to be good data. These occurrences are considered to be minimal and thus having no real impact on the simulation model.

**Model Translation.** This stage will detail the functionality of each FORTRAN subroutine and major SLAM function. Modules will be presented and explained in the order of their occurrence in the simulation code, and not according to their input to the simulation model.

**Program DATA.** This program exists as an independent program to read and prepare the initial data retrieved for the AFMPC database. As alluded to in the data acquisition stage, this program extracts inputs from the position file, and searches the personnel file for the person filling that position. If a position is not filled, that is also determined and marked in a attribute called "STATUS" for that position. All position and personnel attributes are read in as character data, checked for validity, converted to integer categories and written to a consolidated acquisition workforce output file. Program DATA also creates data which is currently missing from the AFMPC database but is critical for the simulation model. These elements are the required certification level for each position record and the acquisition corps membership designator for each personnel record. This data was created within the rank and educational
guidelines of DoD manual 5000.52. Once the next version of the AFMPC database software is released in June 1992, these constructed elements will not be necessary. The next software release will implement the new standardized requirements for tracking acquisition workforce position and personnel information according to DoD Instruction 5000.55. After all the position and personnel data has been sanitized and consolidated into the acquisition workforce file, the program captures the following initial population statistics:

1. Total number of acquisition positions
2. Total number of critical acquisition positions
3. Total number of filled positions
4. Total number of filled critical positions
5. Total number of Acquisition CORPS positions.
6. Starting population of positions at each certification level
7. Total number of personnel certified at each level.

These statistics will be compared to the additional yearly statistics gathered during the aging process to make inferences during the results section. Normally, this program would have been included in SLAM as a subroutine, but the run time exceeded 12 hours and would impact the time requirements for running subsequent runs.

**SLAM Program Cards.** This program is the actual code that starts the program running. Here, simulation duration, file prioritization, and important time persistent variables are initialized.

**Program MAIN.** Program MAIN serves two major purposes in this model. The first is to reinitialize the
NSET/QSET array to allow for a high number of entities and attributes per entity used during the simulation. The second purpose is to set default output values and call the SLAM execution program.

Subroutine Event(I). This subroutine provides a mapping between the SLAM scheduler for the event calendar and the actual FORTRAN routines being scheduled.

Subroutine INTLC. The main purpose of subroutine INTLC is to schedule the data preparation routine and the initial occurrence of the training courses at AFIT. Additionally, two counters for Selective Early Retirement Boards (SERB) and Specialty courses are initialized. The first counter, ICOUNT, limits the scheduling of SERB boards to only the first five years of the simulation. According to HQ USAF/DPXA, SERB boards have not been scheduled after 1997 and it is expected that they will be discontinued at that time. Hence, I have limited their use after the fifth year of the simulation. The second counter, SPECL, limits the occurrence of specialty courses to twelve times per year. Unlike the other core courses used in the simulation, the specialty courses do not represent a single class. A specialty course is schedule each month to represent a variety of courses offered during the month that could be used for certification purposes.
Subroutine PREP. This subroutine uses the output of program DATA to generate the simulation entities and auxiliary attribute matrix. The auxiliary attribute array is initialized first. Position and personnel attributes are read in from an input file. The first six data elements of the matrix represent position requirements. The remaining 64 elements represent personnel data. After the current data is input, other attributes such as the year and beginning population markers are set. A loop is used to read these values for each person into attribute array and then the SLAM entities are filed into the simulation workforce file #15. The last vital function PREP is to schedule subroutine DEMAND.

Subroutine DEMAND. This subroutine has four basic functions. The first is to compute the passover attribute(69) for each personnel each year during the aging process. The attribute PASOVER, will be used by the attrition routine to remove personnel from the workforce. The second function is to call subroutine ACQLOG which will be discussed next. Output from ACQLOG is used by DEMAND to compute the number of people in the backlog population and the demand for key certification courses each year during the aging process. Key courses include SYS100, SYS200, SYS225, SYS400 and a grand total demand for specialty courses. The third function of DEMAND serves as a check for function two. Course demands are computed above in a discrete fashion at the end of each year.
Additionally, DEMAND utilizes six time persistent variables for the backlog population and the five key courses. The previous method of calculating course demand does not account for the decreases in demand at the end of each course throughout the year. Hence the graph of this output should show a stepping decrease in demand each year. The use of time persistent variable to analyze demand should produce a more accurate pictorial representation of the course demand. Although the discrete and time persistent methods of analyzing course demand are calculated differently, the curves should show similar demand predictions. The last function of DEMAND is the most critical. Each year in the simulation, DEMAND cycles through the course history of each person using subroutine ACQLOG and files that individual in the appropriate waiting queue for a course that is needed for the next level of certification. This filing process is based on the binary attribute (62). If the person is determined to be among the backlog population, attribute (62) = 1, the individual is filed in the priority queue for the particular course. If the person is not a member of the backlog population, attribute (62) = 0, the individual is filed in the on-time training queue for that course. Otherwise, the person does not need any courses (level III certified) and is filed back in the main acquisition population. This process setup the
file structure for course attendance selection used by each of the individual subroutines for key courses listed above.

**Subroutine ACQLOG.** As mentioned earlier, this subroutine is called by DEMAND. The purpose of ACQLOG is to review personnel records each year and assign the appropriate evaluated certification level. Additionally, ACQLOG stores indicators in the attributes of each person (ATRIB(50-60)) to point to specific course deficiencies for level three certification throughout career development. For each person in the workforce, DEMAND stores a copy of that person's record in a temporary array called TEMP. TEMP is passed to ACQLOG for an evaluation of each person's educational history. The educational history of each person is compared to the certification standards of the acquisition logistics career field. Credit for completed courses is maintained in a local requirements array called REQMT. When this array of credits is compared to the list of requirements, the deficiencies are determined. Using this information in each persons records, DEMAND can appropriately file people in the queue of the lowest level course they require for certification.

**Subroutine CRSDMD.** This subroutine is also called by DEMAND. CRSDMD compiles an output file of yearly statistics for courses required by the acquisition workforce. This information will be used in post analysis for graphs of the results.
Subroutine ATTRIT. The purpose of this subroutine is to provide attrition from the workforce each year of the aging process. Attrition is accomplished by two means. The first is based on the natural attrition rates for each year of service. A uniform distribution is used to distribute the attrition across the population for each year of service. The second method is by promotion passover. If an individual is passed over for promotion two times, that person is attrited from the system. The attrition routine does not account for force reduction due to SERB boards. That routine will be presented later.

Subroutine PROMOTE. This subroutine is used to promote people based on promotion rates for each rank. Below-the-zone, zone, and above-the-zone are also included. Personnel are selected to meet the promotion board by year of service. The expected year of service for promotion to each rank was obtained from HQ AFMPC. A uniform distribution was employed to distribute promotions across the population of people meeting the different promotion boards.

Subroutine ACCESS. This subroutine is responsible for introducing new lieutenants into vacant positions in the workforce. Accessions can only occur to empty positions requiring the rank of lieutenant. The accession rate was acquired from HQ AFMPC. The accession function occurs after promotions, SERBS, attrition, and position updates. This
order of events ensures the population of positions is accurate before introducing personnel into the workforce.

Subroutine UPDATE. Subroutine UPDATE performs several major functions in the aging process. This subroutine calls all population manipulation routines such as promotions, attrition, etc. The first function of UPDATE is to empty all course queue into a single workforce file(#15). The second function of UPDATE is to call the population manipulation subroutines. Each of these subroutines require personnel to be in a single file for ease of location. The actual process of manipulating people occur in the auxiliary attribute array and then entities are located and updated. The third function of UPDATE is to update the membership of people in the acquisition corps. This will be necessary prior to filling critical positions since only corps personnel can fill critical positions. This is accomplished by creating a file prioritized by rank (file #13). This file is used as temporary storage for all personnel having an acquisition corps designator set to one (attribute 16 = 1 for membership) and are not currently filling a corps position. Selection to a critical position would emulate a promotion to a position of higher responsibility. The auxiliary attribute array is then searched for vacant critical positions. For each vacant position found, a search is made through file 13 for a person having the position qualifications. Since file 13 is
prioritized by rank, the most ranking individual will be selected for the job. If a person does not meet the criteria for the position, he is then stored in file 14 until the search is complete for that position or until a person is found. Once the position is filled or determined to be vacant, all personnel are returned to file 13 in preparation for the next vacant position. Once the search is complete for critical positions, file 13 is emptied and successively filled with people ranking from general to lieutenant who fill positions which they out rank. Subsequent searches of the auxiliary attribute matrix are done by rank starting at general for vacant positions. Each position is filled with the highest ranking person meeting the position requirements. After all position updates are made, new accessions can be made to the vacant lieutenant positions. Hence the next important function of subroutine UPDATE is to call the accession routine. Finally, UPDATE calls subroutine DEMAND to evaluate the yearly training of the workforce, and separate it into the necessary course files again for the beginning of the next year.

Training Course Subroutines. This section combines the explanation of all training course subroutines. Individual routines exist for courses SYS100, SYS200, SYS225, SYS400, and a representation of specialty course training. Within each category, several routines may exist to emulate
sequential offering of that course throughout the year. These subroutines use the files generated by subroutine DEMAND. An initial check is made to determine if enough personnel exist to offer the course. Initially, this checks use a variable equal to the total course quota, but can be changed to smaller values for sensitivity analysis. Each course has a priority (backlog) and on-time file of entities to select from. Using a base line of 70% priority opportunity, personnel are selected from the priority file first until 70% of the course quotas are filled, and then the remaining quotas are filled from the on-time training file. If there are not enough priority personnel to fill the 70% quota, all backlog personnel are selected and the remaining quotas filled by on-time personnel. Once a person is selected for a course, the TDY attribute (attrib(70)) is set to one to prevent that person from being selected to any other course during his current training. The entity is then filed into a school file associated with each category of courses above. The last function of each training course is to schedule its own graduation event.

**Graduation Subroutines.** Like the training courses above, discussion of all graduation subroutines are combined in this section because of their similar function. Only one graduation routine exists for each category of the courses above. The subroutine removes each entity from the course
file and checks the school entry time against the length of the school. If an entity has completed the course duration it is removed. A check is made to find the next logical course to take and the entity is filed in that course queue.

**Verification and Validation.** To verify the model performs as intended, sample data sets were contrived to test the functionality of each subroutine. Additionally, each FORTRAN subroutine was implemented as an independent FORTRAN program and tested prior to integration into the SLAM environment. Since this is the initial year of implementation of the APDP program, model validation must be suspended until data under the new program is available for collection.

**Strategic and Tactical Planning.** Initially, the primary purpose of this model is to determine the demand for APDP courses on AFIT and the budgetary impact of adjusting training requirements to meet the demand. Once cost data has been appropriately integrated, this model will be instrumental in forecasting course demand and associated budgets. Additionally, this model can be used to analyze the difference between DoD policy for APDP certification issued in DoD manual 5000.52 and Air Force level requirements listed in AFR 36-27. This model can also be employed during yearly budgeting cycles to help justify operational expenses of current course media or the need for additional resources to meet the demand of APDP courses. Strategically, this model has been identified
by several Air Force agencies as a tool to support ongoing projects. During the stages of exploratory study, agencies such as HQ USAF/DPXY and HQ AFMC/DPA were among the many that expressed an interest in the research efforts and simulation model contained in this thesis. Because of their contract with SRA corporation, HQ USAF/DPXY can use the model as a tool to validate the efforts of the contractor. Since the model provides yearly analysis of the certification status of the acquisition population, it will be an ideal tool for HQ AFMC/DP to monitor the APDP efforts to increase the proficiency of the acquisition workforce. The new command will have the responsibility to manage over 80% of the acquisition workforce. Because of their Air Force level manpower analysis requirements, HQ AFMPC/DPMYA has also requested a copy of the model. Efforts have recently begun to automate the APDP certification process. The accomplishments in this research and the resulting model will serve as a springboard for those efforts. Implementation of this model under the conditions requested by the organizations above is beyond the scope of this study, but will be listed as a recommendation for further study later in this document.

The final three stages listed by Pritsker, experimentation, analysis of results, and implementation will be discussed in the next chapter.
V. Results and Conclusions

This chapter includes an analysis of the acquisition workforce and some conclusions based on that analysis. As stated in Chapter I of this document, the purpose of this research is to analyze the acquisition workforce and determine the impact of the new APDP educational and training requirements on AFIT. The analysis is broken down into two parts; an analysis of the initial workforce based on the raw data received from HQ AFMPC and an analysis of the future workforce using the simulation model. Due to run-time limitations on AFIT's current computer capability, the future workforce will be analyzed using the simulation model and a representative sample of the total workforce. The following results and conclusions of the analysis are provided with reference to the objectives outlined in Chapters I.

Results

Initial Workforce Analysis. To truly capture the effects of the new APDP educational requirements and the importance of AFIT's role in APDP, an analysis of the initial acquisition workforce was completed using the raw data provided by HQ AFMPC (Military personnel only). The data throughout this analysis represents a "snap shot" of the acquisition workforce as of December 1991. The purpose of this analysis was to dissect the workforce into the backlog and on-time training...
requirements prior to onset of simulated AFIT training. This analysis was accomplished in two parts. First, the workforce was analyzed by certification level and secondly, by acquisition position type. The results of the analysis by certification level is summarized in Table 5.1.

Table 5.1: Workforce Analysis by Certification Level

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>NUMBR POSN</th>
<th>NUMBR FILL</th>
<th>POSN MANNING</th>
<th>ON-TIME REQMTS</th>
<th>BACKLOG REQMTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL 1</td>
<td>4890</td>
<td>3733</td>
<td>76%</td>
<td>427</td>
<td>3306</td>
</tr>
<tr>
<td>LEVEL 2</td>
<td>2156</td>
<td>1716</td>
<td>80%</td>
<td>150</td>
<td>1566</td>
</tr>
<tr>
<td>LEVEL 3</td>
<td>2070</td>
<td>1710</td>
<td>82%</td>
<td>177</td>
<td>1533</td>
</tr>
<tr>
<td>TOTALS</td>
<td>9116</td>
<td>7159</td>
<td>79%</td>
<td>754</td>
<td>6405</td>
</tr>
</tbody>
</table>

Column two of Table 5.1 provides the number of positions required for each of the different certification levels. Since this information is not yet maintained in the manpower and personnel databases, this column of data is estimated using the guidelines established in DOD Instructions 5000.55 and DOD Manual 5000.52. The required level of certification estimated for each position was based on the authorized grade of the position. All lieutenant and captain positions were estimated as level one positions. Majors and a uniform distribution 50% of all lieutenant colonel positions were given estimates of level two. All remaining positions were estimated at level three.

Column two of the table provides the number of positions filled out of the total estimated at that level. This
manning percentage is reflected in column three. During simulation analysis, the estimate of the total manning was rounded to 80% and used during the accession routines throughout the simulation. Columns four and five are subsets of column two. If a position is filled with a person who is certified at the estimated required level of certification, the person is a member of the on-time training population. Otherwise, the person does not meet the position requirements and is a member of the backlog population. Since each person in the backlog populations requires a minimum of one course, column six of the table provide a rough estimate of the absolute minimum course demand facing AFIT at the beginning of 1992. The actual course demand will be computed in the initial stages of the course simulation analysis. A graphical representation of the initial workforce as summarized by Table 5.1 is shown in Figures 5.1 and 5.2.

Now the workforce will be analyzed from an acquisition position perspective. Recall that three type of acquisition positions exist: critical positions, acquisition positions, and developmental acquisition positions. Critical positions are for senior level management personnel and can only be filled by members of the acquisition corps. Acquisition positions are all non-critical positions in the workforce that are designated by the Defense Acquisition Workforce Improvement Act (DAWIA) as a member of the acquisition
Initial Workforce Analysis
By Certification Level

Figure 5.1
Initial Position Analysis
By Certification Level

Figure 5.2
workforce. Furthermore, personnel filling these positions will carry one of the acquisition designated career field codes. Developmental acquisition positions are those which regularly interact with acquisition activities, but do not carry an acquisition workforce position designator. Table 5.2 summarizes the initial workforce analysis for the different types of acquisition positions.

**Table 5.2: Workforce Analysis by Position Type**

<table>
<thead>
<tr>
<th></th>
<th>NUMBR POSN</th>
<th>NUMBR FILL</th>
<th>POSN MANNING</th>
<th>ON-TIME REQMT</th>
<th>BACKLOG REQMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRITICAL</td>
<td>1565</td>
<td>1265</td>
<td>81%</td>
<td>178</td>
<td>1087</td>
</tr>
<tr>
<td>ACQUISITION</td>
<td>7050</td>
<td>5450</td>
<td>77%</td>
<td>560</td>
<td>4890</td>
</tr>
<tr>
<td>DEVELOP</td>
<td>501</td>
<td>444</td>
<td>89%</td>
<td>16</td>
<td>428</td>
</tr>
<tr>
<td>TOTALS</td>
<td>9116</td>
<td>7159</td>
<td>79%</td>
<td>754</td>
<td>6405</td>
</tr>
</tbody>
</table>

Table 5.2 emphasizes the large distribution workforce personnel in backlog status. The crucial element of this table is the population of backlog people in the critical positions. Their impact is more substantial since their duties contain the highest level of responsibility in the procurement process. Again, it is quite apparent that the initial state of training and educational status of the acquisition workforce is quite below the standards set by AFDP. A graphical representation of Table 5.2 is shown in Figure 5.3. Although the greatest impact on the procurement process may be captured in the backlog status of the personnel filling critical positions, the greatest impact on AFIT will
Initial Workforce Analysis
By Acquisition Position Type

Figure 5.3.1
Initial Position Analysis
By Acquisition Position Type

Developmental

Critical

Filled 59.7

13.7 Filled

17.5

3.2 Unfilled

4.9 Filled

Unfilled

Acquisition

Figure 5.3.2
stem from personnel filling acquisition positions since the vast majority of the backlog population are filling these type positions.

Simulation Model Analysis. Since the APDP process requires constant evaluation of each individual in the acquisition workforce, the original approach to analyzing the impact of APDP on AFIT was to include each individual in the simulation model during analysis. This approach identified a severe limitation to the model as well as AFIT. The model has two representations of the acquisition population during the simulation. One representation is the actual entities in files and represent acquisition personnel filling positions in the workforce. The second representation is a matrix containing a duplicate of each person in the entity files and represent the record keeping function of organizations such as AFMPC which maintain information on the people and positions in the workforce. This structure was implemented to maintain independence between the entities and their associated attributes since the movement of people to different positions and training is independent of functions which occur at record keeping organizations such as promotions boards and selective early retirement boards (SERB). Therefore, keeping the two representations of the acquisition populations allows attributes of entities to be updated during simulation without necessarily removing the entities from their current files.
After effectively integrating both representations of the acquisition population in the simulation model, the initial status of the acquisition workforce was analyzed again prior to the start of simulated twenty-eight year cycle of personnel training and career development. This provided an independent check for the information found during the data analysis done by the FORTRAN program. This is where the limitation of the model was discovered. After 5 days of dedicated CPU time on a SUN SPARC Station II containing 28 MIPS of processing power, only 7 years of simulation was complete. The SUN stations are currently the fastest source computing time available at AFIT. Hence it can be concluded that the model has limited usage unless greater processing power is obtained.

To bypass this obstacle, a representative sample of the acquisition workforce was extracted from the data provided by AFMPC and applied to the model. The new population contained 1000 positions and the associated people in the filled positions. The extraction was done using a FORTRAN program based on a random number generator and a uniform distribution between zero and one. This program was written by Captain Lisa Belue in her thesis effort, An Investigation of Multilayered Perceptrons for Classification. The details of the code extracted from her thesis can be found in Appendix K. To maintain credibility of the conclusions that will be drawn from analysis of this sample population, analysis will be done.
to show that the sample population contains characteristics of the initial population analyzed in table 5.1. The results of this analysis is contained in table 5.3 below.

Table 5.3: Sample Workforce Analysis by Certification Level

<table>
<thead>
<tr>
<th>LEVEL</th>
<th>NUMBR POSN</th>
<th>NUMBR FILL</th>
<th>POSN MANNING</th>
<th>ON-TIME REQMTS</th>
<th>BACKLOG REQMTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>554</td>
<td>426</td>
<td>77%</td>
<td>47</td>
<td>390</td>
</tr>
<tr>
<td>II</td>
<td>227</td>
<td>177</td>
<td>78%</td>
<td>13</td>
<td>164</td>
</tr>
<tr>
<td>III</td>
<td>219</td>
<td>169</td>
<td>78%</td>
<td>17</td>
<td>152</td>
</tr>
<tr>
<td>TOTALS</td>
<td>1000</td>
<td>772</td>
<td>77%</td>
<td>77</td>
<td>695</td>
</tr>
</tbody>
</table>

Comparing Table 5.1 to Table 5.3, it can be concluded that the sample population is indeed representative of the true population based on an analysis with respect to certification level. To complete the analysis of the sample population, the sample workforce will now be analyzed with respect to acquisition position type. A summary of this analysis can be found in Table 5.4. Once again it can be concluded that the sample population is representative of the actual acquisition workforce.

Table 5.4: Sample Workforce Analysis by Position Type

<table>
<thead>
<tr>
<th>POSITION</th>
<th>NUMBR POSN</th>
<th>NUMBR FILL</th>
<th>POSN MANNING</th>
<th>ON-TIME REQMT</th>
<th>BACKLOG REQMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRITICAL</td>
<td>155</td>
<td>116</td>
<td>75%</td>
<td>17</td>
<td>99</td>
</tr>
<tr>
<td>ACQUISITION</td>
<td>793</td>
<td>613</td>
<td>77%</td>
<td>60</td>
<td>553</td>
</tr>
<tr>
<td>DEVELOP</td>
<td>52</td>
<td>43</td>
<td>83%</td>
<td>0</td>
<td>43</td>
</tr>
<tr>
<td>TOTALS</td>
<td>1000</td>
<td>772</td>
<td>77%</td>
<td>77</td>
<td>695</td>
</tr>
</tbody>
</table>
Simulation Results. Using the small sample size, ten simulation runs were generated to analyze course demand and behavior of the backlog population. The first simulation run utilized AFIT's 1991 training capability. The next five runs utilized increments of 50% increases to the baseline capability by increasing course quotas. Hence, the sixth run contains a training capability of 250% increase of the 1991 training baseline. The last four runs were done to analyze possible choke points in the system. To appropriately adjust the training capability for the sample workforce population, the percentage reduction in population was applied to the allowable course quotas for each course. All course quotas were provided by AFIT School of Logistics Administrative office, AFIT/LSA. The baseline quotas are shown in Appendix G. Two categories of statistics were capture during each simulation run. Time persistent variables were used to capture the behavior of the course demand over the entire 28 year time period and discrete variables were use to summarized course demand at the end of each year. The results of the simulation runs for time persistent variables are shown in Appendix G. Since the unit of increment during the simulation was days, the Means column in the table of time persistent statistics is interpreted as the expected demand for any given day during the 28 year cycle. The Minimum column represents the initial state of the system prior to start of the
simulation run. The Maximum column represents the amount course demand present at the beginning of the first simulation year after the initial workforce data has been analyzed by subroutine PREP of the model. Because of the "averaging effect" experienced when collecting statistics continuously over time, the details of the behavior of course demand and the backlog population is obscured. However, these results can be obtained from the discrete variables.

The backlog status and course demand were analyzed at the beginning of each year. Graphs demonstrating this output for each run can be found in Appendix J. The graphs demonstrate the behavior of each variable as it decreases over years 1992 to 2019. It is clear that each of the training courses as well as the backlog population demonstrate a exponential decrease over time until the steady state zone is reached. Steady state is indicated when the bars on the chart cease decreasing by any significant amount. From the graphs contained in Appendix J which display the results of each year, the time frame for steady state training can be estimated. Using the current baseline training capability, the onset of steady state training is expected approximately year 2014. When this capability is increased by 50%, steady conditions are moved to approximately year 2013. Further increasing capability to 100% of the baseline causes steady state to start at year 2010. The numerical computations
displayed in the graphs can be found in Appendix I. Consider the graphs contained in figures 5.4. This graph represents the behavior of the backlog population over the range of experimental training capability increases. After analyzing the backlog population status displayed in Figure 5.4, it can be determined that the backlog population is not responsive to the percentage increases in training capability. Thus some suspicion of the training methodology arises from the analysis of the backlog population alone. Now consider the graphs contained in Figure 5.5. This graph analyzes the demand for course SYS100 over the range of capability increases. It is obvious from this graphs that the demand for SYS100 is decreasing tremendously with each increment of training capability. This behavior is also observed for SYS200 course demand in Figure 5.6. However, for SYS225 the results are quite different. From Figure 5.7, it can be concluded that the demand is responsive to training increases for the first 6 years. However, after year 1997, the behavior is not responsive to capability increases. At this point, it is beginning to become clear why the backlog demand does not seem responsive to training increases. It appears that there exist a "choke point" in the system. Recall from Chapter 4, the model assumes personnel will progress systematically through the course requirements for certification. This approach to certification is displayed in Figure 5.8. According to the
Backlog Training Analysis
Based on Percentage Training Increases

Figure 5.4
SYS100 Training Analysis
Based on Percentage Training Increases

![Bar chart showing course demand over years from 1992 to 2017. The chart includes baseline and percentage increase categories.]

Figure 5.5
SYS200 Training Analysis
Based on Percentage Training Increases

Figure 5.6
SYS225 Training Analysis
Based on Percentage Training Increases

Figure 6.7
Course Sequencing

Figure 5.8
Air Force regulation on training courses, AFR 50-5, the courses in Figure 5.8 are prerequisites for each other such that the expected logic for attendance is as displayed. From the analysis thus far, it appears that the combined flow out of SYS100 and SYS200 is not sufficient to consistently fill course SYS225. Hence, the model would cause cancellations for the courses under this condition. Since the current course quota is sufficient to sustain the flow of demand, any increase in capability without increasing the flow into the queue for the course would be useless. The initial experimental runs that generated these results assumed an equal increase in training capability for each course. Since SYS225 already had excess training capacity to handle increases in training capability for SYS100 and SYS200, the increases made during each run was not necessary. Hence, analysis indicate that course increases should not necessarily be equal but instead adjusted only when the flow into the course demand queue is greater than the course quota. Since backlog people requiring SYS225 for certification can only leave the backlog population at the rate of flow out of SYS225, the backlog population demonstrates the same responsiveness to training increases as SYS225. This assumes that SYS225 has the lowest flow rate. A generalization to this condition is that the curved traced out by the backlog status responsiveness to training increases will demonstrate
the behavior of the course having least throughput. Since people flow systematically through the certification process, the initial "bottle neck" affects each of the courses following it. This phenomenon also explains the course demand behavior displayed in Figures 5.8 and 5.9 for SYS400 and Specialty courses. To confirm this suspicion, additional runs were conducted using different course quotas to relieve the suspected "bottle neck" found in SYS100. Since the existing quotas for SYS225 is capable of handling the output of courses SYS100 and SYS200, only SYS100 and SYS200 quotas will be increased. By only increasing the training capability at the "bottle necks" in the training system, training throughput is maximized with minimum resources expended. Previously, the curve demonstrated by personnel leaving the backlog population was unresponsive to training increases. Using the new training capability with increased flow through the Systems 100 and 200 APDP courses (150% increases), Figure 5.11 was observed. This analysis implies that preparation for decreasing the backlog demand should begin with determining the critical flow points through the network of courses required by APDP for certification for each career field in acquisitions. Once the critical points have been established, iterative optimization is done by increasing training capability at that point until it is no longer a critical point. New critical points are then identified. This
SYS400 Training Analysis
Based on Percentage Training Increases

Figure 6.9
Specialty Course Analysis
Based on Percentage Training Increases

Figure 6.10
Experimental Approach
Backlog Demand Analysis

Figure 5.12
process repeats until the desired level of training throughput is accomplished.

Conclusions

Thus far an analysis of the initial workforce using the raw data provided by HQ AFMPC has been completed. Using a prototype of that population, an analysis of the behavior of both the backlog population and the course demand was undertaken. Given that the prototype does behaves like the real world, the following conclusions can be made.

1. By the standards of APDP and the guidelines of the Acquisition Logistics career field, the acquisition workforce is severely undertrained. The vast majority of the population exists in the backlog training status. More specifically, our initial analysis shows that 89.5% of the acquisition workforce is in the backlog status.

2. It can also be concluded from the current training capability that steady state training requirements are not expected until approximately year 2014. This assumes that the prototype model behaves like the true population.

3. Analysis of the backlog population and course demands indicate that SYS100 and SYS200 combine to produce a "choke point" in the certification process for people in Acquisition Logistics career field. In order to minimize impact, training increases should start with increasing course quotas or course offerings to critical areas in the training network until
those areas no longer constrain the certification process. The iterative process of increasing training capability only at critical points will minimize the cost of increasing training capability. From the analysis of the initial acquisition workforce by certification level, it was shown that the vast majority of the backlog population existed at levels one and three. Hence, analysis suggest initial training increases to reduce the backlog should concentrate here.

4. Finally, the issue of impact on AFIT must be addressed. The magnitude of the impact on AFIT is directly determined by how AFIT management chooses to attack the backlog population. Aggressive goals which require large increases in training capability will naturally impact AFIT much more severely than passive goals which allow the backlog status to exist for over a decade. Several simulation runs were conducted at different capabilities to analyze the response of the backlog population status. Additional research to incorporate a cost module in the simulation model would be helpful in this iterative process. This topic will be discussed further in the recommendations for further study.
VI. Recommendations

Introduction

Since this research involves a wide variety of DOD efforts to analyze the acquisition workforce, there exist many directions of further study for future analyst, however, recommendations in this chapter will be limited to those that directly impact the problem addressed in this thesis.

Model Formulation. As discussed earlier in Chapter V, this model is severely limited due to data processing time requirements. Assuming that AFIT will not purchase computers capable of rendering this problem ineffective, other coding changes can be made. One recommendation is to dissect each entity into its critical and non-critical attributes. This will relieve the requirement for processing all seventy attributes each time an entity is utilized. Another recommendation is to use a different simulation language or programming language that has better file handling capability. SLAM only allows one priority statement per file. Thus, several files must be used to differentiate between people of the same class, but requiring different priority for processing.

Cost Modelling. To further analyze the impact of APDP on AFIT, the cost of increasing training capability must be considered. Furthermore, AFIT utilizes several methods of
instruction for different courses. Each method has its benefits, disadvantages, and associated costs. A recommendation in this area is to first develop a cost function for each method of instruction. The function would contain all the major factors contributing to the expense of offering the course. Secondly, implement the cost functions as a module of the simulation model which provide cost estimates as a function of course demand and training capability. Finally, an automated capability of iteratively optimizing training capability for a given budget can be added. A model possessing these capabilities would be more effective and conclusive in identifying the total impact of APDP on AFIT.
## Appendix A

### Acquisition Courses

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Appendix B: Sample Input Data

Personnel Input Data

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| 0010604| MAJ ZT | 13 | TECH M | 5 | H2865B | EQU | EPD | VB3 | URN | YYJ | V8D | | | | | | | | | | |
| 0208398| CPT ZS 1 R | 12 | OTHR M | 3 | H2671 | 2RY | 4HQ | 75E | AAA | 32X | ZMQ | | | | | | | | | | |
| 0172943| CPT ZK 1 K | 13 | BUS M | 7 | 6746 | PBC | 24X | UGJ | EJ3 | E90 | | | | | | | | | | |
| 0343813| CPT ZK | 6 | OTHR M | 1 | 6746 | 54H | 8NU | ZYC | MWV | IFF | 8PP | | | | | | | | | | |
| 0002703| MAJ ZC | 13 | BUS M | 5 | T6534 | 8EE | UGH | AAS | D99 | VGE | 22H | | | | | | | | | | |
| 0174141| LTC IC 2 T | 19 | BUS M | 4 | H6516 | N83 | MV9 | AJS | 0HZ | AAS | DRH | | | | | | | | | | |
| 0145696| LTC ZT 9 T | 15 | TECH M | 4 | K2875B | 3EL | TR9 | 2RX | T3Z | V27 | VZ6 | | | | | | | | | | |
| 0360998| LTC IL 9 T | 21 | BUS M | 3 | 0046 | N83 | 10E | 10E | EO6 | EHC | | | | | | | | | | |
| 0219254| CPT ZQ 9 T | 11 | TECH B | 1 | H2845 | MV4 | TR9 | 3EL | | | | | | | | | | | | |
| 0138119| LTC IP 1 T | 18 | BUS M | 4 | 2716 | N83 | 2RZ | 0HZ | VGE | 9X0 | XLE | | | | | | | | | | |
| 0142870| LTC ZZ 1 T | 19 | BUS M | 6 | 2716 | 2RZ | VG6 | 3EL | 2RY | 4HQ | WGN | | | | | | | | | | |
| 0215931| CPT ZQ 9 T | 11 | TECH B | 3 | H2825 | QTT | 9XZ | 81A | 9X0 | MMV | EAY | | | | | | | | | | |
| 0360291| CPT ZL | 8 | BUS B | 2 | 4024 | 2RX | 2RX | PZW | 7AA | DRH | 6QP | | | | | | | | | | |
| 0143729| MAJ ZA 2 T | 16 | BUS M | 3 | 2716 | 2RZ | 2RY | 8C9 | X8E | 1UP | U76 | | | | | | | | | | |
| 0021886| CPT ZT 1 T | 10 | BUS M | 6 | H2835 | HVF | 3CN | ZD4 | 9X0 | 4HQ | 4HQ | | | | | | | | | | |
| 0010340| 1LT ZT 9 T | 4 | TECH B | 4 | 2855 | 1FF | WYK | | | | | | | | | | | | | | |
| 0160810| CPT ZQ | 8 | TECH B | 3 | 2825 | 4HQ | 8B3 | 1QG | 6PZ | 15F | | | | | | | | | | |
| 0091828| COL ZS | 16 | OTHR P | 4 | H9356 | NFE | NFE | QL9 | NFE | QL9 | WSU | | | | | | | | | | |
| 0360605| COL IL | 23 | OTHR M | 3 | 0046 | 2RX | 7PQ | UWB | OEK | VBR | XBA | | | | | | | | | | |
| 0019507| LTC IP 5 T | 22 | TECH M | 5 | 2806 | NPI | N83 | QTT | SY7 | DRH | RW5 | | | | | | | | | | |

95
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| 0184438 | CPT | ZT | 1 | P | 9 | TECH | B | 2 | G2815A | 79D | 9X0 | 1NA | 3ZZ | 1912 |
| 0016609 | LTC | IY | 22 | TECH | P | 2 | 5516 | YBR | AMV | FEA | 1913 |
| 0218572 | MAJ | ZT | 16 | OTHR | M | 3 | 192865B | 2RX | 09N | 09M | VBX | YH4 | V8D | 1914 |
| 0173240 | MAJ | ZQ | 1 | Q | 16 | OTHR | B | 2 | U2806W | 2RY | ZRP | S5S | 2RX | B8Y | S5R | 1915 |
| 0395375 | MAJ | ZL | 13 | BUS | M | 4 | 4016 | 2RX | WYF | 44M | PZW | 31D | UDG | 1916 |
| 0136668 | MAJ | ZQ | 2 | R | 16 | TECH | M | 1 | H2806 | 2RX | 3EL | MV4 | VC5 | ERR | 1917 |
| 0082469 | MAJ | ZP | 9 | T | 14 | TECH | M | 3 | 2711 | 2RY | TR9 | AAA | 16D | 1918 |
| 0131777 | MAJ | ZP | 1 | K | 15 | BUS | M | 6 | 0071 | PBH | X8E | PBE | UGH | ZYC | PBC | 1919 |
| 0200750 | MAJ | ZT | 9 | T | 14 | BUS | M | 1 | U2711W | N83 | 4HQ | ABM | AHP | V8D | ERR | 1920 |
| 0171503 | CPT | ZP | 1 | T | 11 | BUS | M | 2 | 2711 | MMW | TR9 | 2RX | T22 | TB3 | ERR | 1921 |
| 0165936 | LTC | ZP | 2 | T | 17 | OTHR | M | 3 | 2716 | N83 | 1Q1 | 3HF | NC4 | 1922 |
| 0391036 | LTC | ZT | 19 | TECH | P | 4 | G2806 | 2RX | TR9 | PZW | V8D | R4W | 1923 |
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| 0138145 | CPT | ZQ | 9 | TECH | M | 4 | H2855 | WYF | 9X0 | 4HQ | 1925 |
| 0071167 | CPT | ZQ | 1 | Q | 5 | TECH | B | 1 | H2825 | 92G | 81A | QTT | 8B3 | 4HQ | 1926 |
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| 0120722 | CPT | ZT | 7 | TECH | M | 1 | H2825 | 2RX | 1928 |
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| 0216902 | 2LT | ZP | 1 | TECH | B | 1 | 2051B | 1932 |
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Appendix C

PROGRAM DATA FOR VARIABLE DEFINITION

INPUT VARIABLES (Character Data)

POSNUM
    Defn: position number in the manpower file.
    Field: 1-7

PERSON
    Defn: position number in the personnel file.
    Field: 1-7

POSRNK
    Defn: authorized grade for the position in the manpower file.
    Field: 10-12
    Values: LT -- GEN

PERRNK
    Defn: actual grade of an individual in the personnel file.
    Field: 10-12
    Values: 2LT -- GEN

POSTYP
    Defn: acquisition position type in manpower file.
    Field: 14
    Values: I, O, or Z

PERTYP
    Defn: acquisition position type in personnel file.
    Field: 14
    Values: I, O, or Z

MOCAT
    Defn: acquisition career field category for position
    Field: 15
    Values: A thru Z excluding F, I, J, M, N, O, P, Q, and V
DPCAT
  Defn: acquisition career field category for person
  Field: 15
  Values: Same as MOCAT

PREFIX
  Defn: prefix for AFSC
  Field: 17
  Values: not used in simulation

SUFFIX
  Defn: suffix for AFSC
  Field: 22
  Values: not used in simulation

AFSC
  Defn: AFSC for the position without prefix and suffix
  Field: 18-21
  Values: All acquisition AFSC

CLEVL
  Defn: current certification level in personnel file.
  Field: 17
  Values: 0 - 9

FAREA
  Defn: functional area of certification in personnel file.
  Field: 19
  Values: Same as MOCAT

TIME
  Defn: years of service
  Field: 21-22
  Values: 0-40

BACHLR
  Defn: indicates the type of bachelor's degree.
  Field: 24-27
  Values: BUS, TECH, and OTHR

DIPLMA
  Defn: indicates the highest level of education
  Field: 29
  Values: B, M, and P
TOB
  Defn:  time on station
  Field:  31-32
  Values:  0-20

DAFSC
  Defn:  Duty AFSC
  Field:  35-38
  Values:  all acquisition AFSCs

TRNG1 - TRNG24 (Attributes 17-40)
  Defn:  special training courses taken
  Field:  41-EOL

OUTPUT VARIABLES (Integer data)

JOBNUM (Attribute 1)
  Defn:  position number for each acquisition position
  Field:  1-8

POSGRD (Attribute 2)
  Defn:  required grade for each acquisition position
  Field:  10-12
  Values:  10 = General
          9 = LT General
          8 = Major General
          7 = Brigadere General
          6 = COL
          5 = LTC
          4 = MAJ
          3 = CPT
          2 = ILT
          1 = 2LT

RLEVL (Attribute 3)
  Defn:  Required level of certification for the position
  Field:  14-16
  Values:  1-3

ACQPOS (Attribute 4)
  Defn:  acquisition portion type
  Field:  18-20
  Values:  1 = I = critical
          2 = O = developmental
          3 = Z = related (other)
POSCAT (Attribute 5)
  Defn: acquisition position career field category
  Field: 22-24
  Values: 1 = A
         2 = B
         3 = C
         4 = D
         5 = E
         6 = F
         7 = G
         8 = H
         9 = J
        10 = K
        11 = L
        12 = M
        13 = P
        14 = Q
        15 = R
        16 = S
        17 = T
        18 = U
        19 = W
        20 = X
        21 = Y
        22 = Z
        99 = BAD DATA

STATUS (Attribute 6)
  Defn: status of the position
  Field: 26-28
  Values: 0 = vacant
          1 = filled

PERNUM (Attribute 7)
  Defn: position number of the person filling the job
  Field: 30-37

PERGRD (Attribute 8)
  Defn: grade of the person filling the position
  Field: 39-41
  Values: Same as POSGRD above

ACQPER (Attribute 9)
  Defn: acquisition position type
  Field: 43-45
  Values: Same as ACQPOS above
PERCAT (Attribute 10)
Defn: category of career field acquisition position
Field: 47-49
Values: Same as POSCAT above

SLEVL (Attribute 11)
Defn: starting certification level
Field: 51-53
Values: 0 = no certification listed in records
1 = certification 1
2 = certification 2
3 = certification 3
4 = old level 2 on acquisition manager's list
5 = old level 2 on senior acquisition manager's list
6 = old level 3 on acquisition manager's list
7 = old level 3 on senior acquisition manager's list
9 = unknown
99 = erroneous data

FCTCAT (Attribute 12)
Defn: current functional acquisition career field category
Field: 55-57
Values: Same as POS: AT above

YOS (Attribute 13)
Defn: total active duty years of service
Field: 59-61
Values: 0-40

DEGREE (Attribute 14)
Defn: Type of bachelors degree received
Field: 59-61
Values: 0 = business
1 = technical
2 = other

EDLEVL (Attribute 15)
Defn: level of education received.
Field: 63-65
Values: 0 = bachelors
1 = masters
2 = doctorate
CORP (Attribute 16)
   Defn: acquisition corps designator
   Field: 67-69
   Values: 0 = not a member
           1 = member

TRNG1-TRNG24 (Attribute 17 - Attribute 40)
   Defn: special training courses taken
   Field: 71-190 (each 4 characters with 1 space between)
   Values: see appendix A on acquisition training courses

NEWCRS1-NEWCRS10 (Attribute 41-50)
   Defn: special training courses acquired during
           simulation
   Field: 191-250
   Values: see appendix A on acquisition training courses

NEEDI-NEED10 (Attribute 51-60)
   Defn: course deficiencies for level three certification
   Field: 252-311
   Values: AFIT courses offered from list in Appendix A

ELEVL (Attribute 61)
   Defn: Evaluated level of certification
   Field: 313
   Values: 0 = no certification
           1 = level 1
           2 = level 2
           3 = level 3

PRIORT (Attribute 62)
   Defn: Designator between the backlog and on-time training
   Field: 315
   Values: 0 = on-time population
           1 = backlog population

NEW (Attribute 63)
   Defn: Distinguish between the starting population and
           accessions during aging process
   Field: 317
   Values: 0 = entered through accessions
           1 = member of starting population

FREE (Attribute 64, 66, 67)

ENTRY (Attribute 65)
   Defn: School entry date
   Field: 319
Values: extracted from simulation clock as TNOW

YEAR (Attribute 68)
  Defn: Current calendar Year
  Field: 321
  Values: 1992-2020

PASOVR (Attribute 69)
  Defn: Promotion passover counter
  Field: 323
  Values: 0 = no passovers
          1 = first passover
          2 = second passover
          3 = scheduled for attrition from system

TDY (Attribute 70)
  Defn: Designator to prevent a person from being eligible for selection to a course when the person is currently in a course
  Field: 325
  Values: 0 = eligible for course selection
          1 = not eligible for course selection
Appendix D

Attribute Definitions

<table>
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<tr>
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<th>DEFINITION</th>
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<td>1</td>
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NEWCRS
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NEWCRS
NEWCRS

NEEDED COURSE 1 OF 10
NEEDED COURSE 2 OF 10
NEED03
NEED04
NEED05
NEED06
NEED07
NEED08
NEED09
NEED10
EVALUATED CERTIFICATION LEVEL
PRIORITY/ON-TIME DESIGNATOR
NEW ACCESSION DESIGNATOR
FREE
SCHOOL ENTRY DATE
FREE
FREE
CURRENT YEAR
PROMOTION PASS OVER COUNTER
TDY DESIGNATOR
**Appendix E**

**Historical Acquisition Courses**

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Appendix F

Simulation Model Subroutines

PROGRAM MAIN
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'
DIMENSION NSET(900000)

COMMON QSET(900000)
EQUIVALENCE (NSET(1),QSET(1))
NNSET=900000
NCRDR=5
NPRNT=6
NTAPE=7
OPEN (UNIT=NCRDR, FILE='fort.5', STATUS='UNKNOWN')
OPEN (UNIT=NPRNT, FILE='fort.6', STATUS='UNKNOWN')
NPLOT=2
SPECL=1
ICOUNT=1
CALL SLAM
STOP
END

SUBROUTINE EVENT(I)
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

GO TO (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
1,15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27
1,28, 29, 30, 31, 32, 33, 34, 35, 36, 37),I

1 CALL PREP
RETURN

2 CALL SY100A
RETURN

3 CALL SY100B
RETURN

4 CALL SY200A
RETURN

5 CALL SY200B
RETURN
6 CALL SY200C
RETURN
7 CALL SY200D
RETURN
8 CALL SY200E
RETURN
9 CALL SY225A
RETURN
10 CALL SY225B
RETURN
11 CALL SY225C
RETURN
12 CALL SY225D
RETURN
13 CALL SY225E
RETURN
14 CALL SY225F
RETURN
15 CALL SY400A
RETURN
16 CALL SY400B
RETURN
17 CALL SY400C
RETURN
18 CALL SY400D
RETURN
19 CALL SY400E
RETURN
20 CALL SY400F
RETURN
21 CALL SY400G
RETURN
22 CALL SY400H
RETURN
23 CALL SY400I
RETURN
24 CALL SPLCRS
RETURN
25 CALL PRMOTE
RETURN
26 CALL ATTRIT
RETURN
27 CALL ACCESS
RETURN
28 CALL GRD100
RETURN
29 CALL UPDATE
RETURN
30 CALL SERB
RETURN
31 CALL DEMAND
RETURN
32 CALL GRD200
RETURN
33 CALL GRD225
RETURN
34 CALL GRD400
RETURN
35 CALL GRD999
RETURN
36 CALL BATCH
RETURN
37 CALL STATS
RETURN
END
The purpose of subroutine INTLC.FOR is to call the initial subroutines which setup population parameters for the simulation to begin. It also starts the initial training and statistics collection cycles for subsequent iterations by the simulation program.

```fortran
SUBROUTINE INTLC
   INCLUDE '/usr/local/Slam/PARAM.INC'
   INCLUDE 'USER.ONE'
   CALL SCHDL(1, 0.0, ATRIB)
   CALL SCHDL(2, 97.0, ATRIB)
   CALL SCHDL(3, 281.0, ATRIB)
   CALL SCHDL(4, 295.0, ATRIB)
   CALL SCHDL(5, 27.0, ATRIB)
   CALL SCHDL(6, 62.0, ATRIB)
   CALL SCHDL(7, 160.0, ATRIB)
   CALL SCHDL(8, 195.0, ATRIB)
   CALL SCHDL(9, 295.0, ATRIB)
   CALL SCHDL(10, 158.0, ATRIB)
   CALL SCHDL(11, 97.0, ATRIB)
   CALL SCHDL(12, 258.0, ATRIB)
   CALL SCHDL(13, 337.0, ATRIB)
   CALL SCHDL(14, 132.0, ATRIB)
   CALL SCHDL(15, 295.0, ATRIB)
```

118
CALL SCHDL(16, 344.0, ATRIB)
CALL SCHDL(17, 6.0, ATRIB)
CALL SCHDL(18, 55.0, ATRIB)
CALL SCHDL(19, 90.0, ATRIB)
CALL SCHDL(20, 118.0, ATRIB)
CALL SCHDL(21, 160.0, ATRIB)
CALL SCHDL(22, 230.0, ATRIB)
CALL SCHDL(23, 258.0, ATRIB)
CALL SCHDL(24, 13.0, ATRIB)
CALL SCHDL(25, 361.0, ATRIB)
CALL SCHDL(26, 363.0, ATRIB)
CALL SCHDL(27, 365.0, ATRIB)
CALL SCHDL(28, 366.0, ATRIB)
CALL SCHDL(29, 364.0, ATRIB)
CALL SCHDL(30, 362.0, ATRIB)
CALL SCHDL(31, 361.0, ATRIB)
CALL SCHDL(32, 360.0, ATRIB)
CALL SCHDL(33, 360.0, ATRIB)
CALL SCHDL(34, 360.0, ATRIB)
CALL SCHDL(35, 360.0, ATRIB)
CALL SCHDL(36, 360.0, ATRIB)
RETURN
END

*********************************************************************************************
****
* Subroutine PREP reads in the data and set up the initial
* simulation conditions.
*
*********************************************************************************************
****
SUBROUTINE PREP
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

*********************************************************************************************
****
* The following procedures initialize and fill the auxillary
*

119
* attribute array, AUX. This array contains the critical
* attributes of each person in the acquisition workforce.
*
****************************************************************************************************
****
OPEN(UNIT=10, FILE='NEW.DAT', STATUS='OLD')

DO 10 I = 1,ROWS
   DO 20 J = 1, COLS
      AUX(I,J) = 0
   20 CONTINUE
10 CONTINUE

DO 30 I = 1, ROWS
   READ(10,100,END=41) (AUX(I,J), J=1,40)
30 CONTINUE
41 CLOSE(10)

DO 70 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      AUX(I,70) = 0
      AUX(I,63) = 1
      AUX(I,68) = 1992
      DO 60 J = 1, COLS
         ATRIB(J) = REAL(AUX(I,J))
      60 CONTINUE
      CALL FILEM(15,ATRIB)
   END IF
70 CONTINUE
CLOSE(29)

100 FORMAT(I8, 5(1X,I3), 1X, I8, 9(1X,I3), 24(1X,I4))
PRINT *, 'DONE WITH PREP'
CALL SCHDL(31, 0.0, ATRIB)
RETURN
END

****************************************************************************************************
****
* Subroutine DEMAND uses the attribute arrays AUX and ATRIB to*
* to access the demand of critical courses taught by AFIT in*
* in support of APDP certification policy.
*
****************************************************************************************************
****
SUBROUTINE DEMAND
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER BKLOG, NUM, TOTAL, POP, TEMP(70), YEAR, SPCRS,
$DMD100, HI100, CRS100, LO100, DMD200, HI200, CRS200,
LO200,
$DMD400, HI400, CRS400, LO400, DMD225, HI225, CRS225,
LO225,
$PMC03, DSMC03, SPECLY, BAKLOG

PRINT *, 'STARTING DEMAND'
BAKLOG = 0
HI100 = 0
LO100 = 0
HI200 = 0
LO200 = 0
HI400 = 0
LO400 = 0
HI225 = 0
LO225 = 0
DSMC03 = 0
SPECLY = 0

DO 150 I = 1,70
    TEMP(I) = 0
150 CONTINUE

DO 50 I = 1, ROWS
    IF (AUX(I,6) .EQ. 1) THEN
        IF ((AUX(I,8) .EQ. 1) .AND. (AUX(I,13) .GT. 2)) THEN
            AUX(I,69) = AUX(I,13) - 2
        ELSE IF ((AUX(I,8) .EQ. 2) .AND. (AUX(I,13) .GT. 4)) THEN
            AUX(I,69) = AUX(I,13) - 4
        ELSE IF ((AUX(I,8) .EQ. 3) .AND. (AUX(I,13) .GT. 12)) THEN
            AUX(I,69) = AUX(I,13) - 12
        ELSE IF ((AUX(I,8) .EQ. 4) .AND. (AUX(I,13) .GT. 16)) THEN
            AUX(I,69) = AUX(I,13) - 16
        ELSE IF ((AUX(I,8) .EQ. 5) .AND. (AUX(I,13) .GT. 21)) THEN
            AUX(I,69) = AUX(I,13) - 21
        ELSE IF ((AUX(I,8) .EQ. 6) .AND. (AUX(I,13) .GT. 24)) THEN
            AUX(I,69) = AUX(I,13) - 24
        ELSE IF ((AUX(I,8) .EQ. 7) .AND. (AUX(I,13) .GT. 26)) THEN
121
AUX(I,69) = AUX(I,13) - 26
END IF
END IF
50 CONTINUE

OPEN(UNIT=19,FILE='FILE.CHK',STATUS='NEW')
PRINT *, 'STARTING ACQLOG SECTION'
DO 10 I = 1, ROWS
IF (AUX(I,6) .EQ. 1) THEN
DO 25 J = 1, COLS
TEMP(J) = AUX(I,J)
25 CONTINUE
CALL ACQLOG(TEMP, BKLOG, DMD100, CRS100, DMD200,
$ CRS200, DMD400, CRS400, DMD225, CRS225, PMC03,
$ SPCRS)
POP = NNQ(15)
DO 19 P = 1, POP
CALL RMOVE(I, 15, ATRIB)
IF (ATRIB(7) .EQ. AUX(I,7)) THEN
DO 140 J = 1, COLS
AUX(I,J) = TEMP(J)
ATRIB(J) = REAL(TEMP(J))
140 CONTINUE
CALL FILEM(15, ATRIB)
GO TO 21
ELSE
CALL FILEM(15, ATRIB)
END IF
19 CONTINUE
21 BAKLOG = BAKLOG + BKLOG
HI100 = HI100 + DMD100
LO100 = LO100 + CRS100
HI200 = HI200 + DMD200
LO200 = LO200 + CRS200
HI400 = HI400 + DMD400
LO400 = LO400 + CRS400
HI225 = HI225 + DMD225
LO225 = LO225 + CRS225
DSMC03 = DSMC03 + PMC03
SPECLY = SPECLY + SPCRS
YEAR = AUX(I,68)
END IF
10 CONTINUE
XX(2) = SUMQ(62,15)
XX(3) = SUMQ(51,15)
XX(4) = SUMQ(52,15)
XX(5) = SUMQ(55,15)
XX(6) = SUMQ(54,15)
XX(7) = SUMQ(53,15) + SUMQ(56,15) + SUMQ(57,15)
NUM = NNQ(15)

122
WRITE(19, *) 'CHECKING THE SUMQ FUNCTION'
WRITE(19, *) XX(2), XX(3), XX(4), XX(5), XX(6), XX(7)
WRITE(19, *) NNQ(15), 'IN SYSTEM BEFORE SPLIT'
DO 111 I = 1, NUM
   CALL RMOVE(1, 15, ATRIB)
   IF (ATRIB(62) .EQ. 1) THEN
      IF (ATRIB(51) .EQ. 1) THEN
         CALL FILEM(11, ATRIB)
      ELSE IF (ATRIB(52) .EQ. 1) THEN
         CALL FILEM(21, ATRIB)
      ELSE IF (ATRIB(53) .EQ. 1) THEN
         CALL FILEM(31, ATRIB)
      ELSE IF (ATRIB(54) .EQ. 1) THEN
         CALL FILEM(41, ATRIB)
      ELSE IF (ATRIB(55) .EQ. 1) THEN
         CALL FILEM(25, ATRIB)
      ELSE IF (ATRIB(56) .EQ. 1) THEN
         CALL FILEM(31, ATRIB)
      ELSE IF (ATRIB(57) .EQ. 1) THEN
         CALL FILEM(31, ATRIB)
      ELSE
         CALL FILEM(15, ATRIB)
      END IF
   ELSE IF (ATRIB(62) .EQ. 0) THEN
      IF (ATRIB(51) .EQ. 1) THEN
         CALL FILEM(1, ATRIB)
      ELSE IF (ATRIB(52) .EQ. 1) THEN
         CALL FILEM(2, ATRIB)
      ELSE IF (ATRIB(53) .EQ. 1) THEN
         CALL FILEM(3, ATRIB)
      ELSE IF (ATRIB(54) .EQ. 1) THEN
         CALL FILEM(4, ATRIB)
      ELSE IF (ATRIB(55) .EQ. 1) THEN
         CALL FILEM(22, ATRIB)
      ELSE IF (ATRIB(56) .EQ. 1) THEN
         CALL FILEM(3, ATRIB)
      ELSE IF (ATRIB(57) .EQ. 1) THEN
         CALL FILEM(3, ATRIB)
      ELSE
         CALL FILEM(15, ATRIB)
      END IF
   END IF
END IF
111 CONTINUE
WRITE(19, *) NNQ(15), NNQ(1), NNQ(2), NNQ(11), NNQ(21), $NNQ(4), NNQ(41), NNQ(3), NNQ(31), NNQ(25), NNQ(22)
OPEN(UNIT=50, FILE='DEMAND.OUT', STATUS='NEW')
CALL CRSDMD(BAKLOG, HI100, LO100, HI200, LO200, HI400, $LO400, HI225, LO225, DSMCO3, YEAR, SPECLY)
PRINT *, 'DONE WITH DEMAND'
CALL SCHDL(37, 0.0, ATRIB)

RETURN
END

******************************************************************************
 ****
 * Given that a person is in an acquisition logistics position,*
 * subroutine ACQLOG compares the courses taken by the person
 * passed through the ATRIB array to the courses required for
 * that career field. The resultant is a certification level
 * based solely upon the training accomplishments of the
 * individual. If this value is less than the starting
 * certification level read in from the original data base, it
 * is discarded. Again we have assumed the information in the
 * original database is correct. The new certification is
 * added to the ATRIB array as one of the attributes of the
 * person and used later during subsequent record evaluations.
 *
******************************************************************************
 ****

SUBROUTINE ACQLOG(TEMP, BKLOG, DMD100, CRS100, DMD200, $CRS200, DMD400, CRS400, DMD225, CRS225, PMC03, SPCRS)
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER TEMP(70), ELEVL, DSMC26, SYSlO0, SYS200, TST100,$SYS400, DSMC01, DSMC02, DSMC3A, DSMC20, DSMC30, SAS001,$SAS006, SYS225, NUM, DSMABC, DSMC3B, TPS100, TPS200,$TPS300, SYS123, NEED(10), REQMT(6,34), LEVL(3),$BKLOG, DMD100, CRS100, DMD200, CRS200, DMD400,$CRS400, DMD225, CRS225, SPCRS, NDX, CHK(1:10),$TEST(6), PMC03, COUNT
* The following list of courses represent the basic mandatory course requirements and their equivalent courses.

```fortran
COUNT = 0
CRS100 = 0
CRS200 = 0
CRS400 = 0
CRS225 = 0
COUNT = 0
SPCRS = 0
ELEVL = 0
ALC001 = 400
DSMC26 = 314
SYS100 = 100
SYS123 = 116
TST100 = 101
SYS200 = 102
SYS400 = 103
DSMC3A = 302
DSMC3B = 303
SAS001 = 200
SAS006 = 205
SYS225 = 104
DSMC01 = 300
DSMC02 = 301
DSMC20 = 311
DSMC30 = 317
DSMABC = 322
TPS100 = 800
TPS200 = 801
TPS300 = 802

DO 125 R = 1, 3
   LEVL(R) = 0
125 CONTINUE

DO 115 I = 1, 6
   DO 105 R = 1, 34
      REQMT(I,R) = 0
105 CONTINUE
```

125
CONTINUE

DO 85 R = 1, 10
   CHK(R) = 0
85 CONTINUE

DO 25 R = 1, 6
   TEST(R) = 0
25 CONTINUE

* The following DO-Loop reads each course occurrence in a
* person's record and compares it to the APDP requirements.
*
DO 10 J = 1,34

* The following IF-statement checks for the completion of
* SYS100 or its equivalents. A boolean variable is set to
* true if the requirement is met and false if it is not.
*
NDX = J + 16
IF ((TEMP(NDX) .EQ. DSMABC) .OR. (TEMP(NDX) .EQ. SYS100) .OR. (TEMP(NDX) .EQ. TST100) .OR. (TEMP(NDX) .EQ. SYS123) .OR. (TEMP(NDX) .EQ. SYS225) .OR. (TEMP(NDX) .EQ. DSMC26) .OR. (TEMP(NDX) .EQ. SAS001)) THEN
   REQMT(1,J) = 1
ELSE
   REQMT(1,J) = 0
END IF

IF ((TEMP(NDX) .EQ. TPS100) .OR. (TEMP(NDX) .EQ. TPS200) .OR. (TEMP(NDX) .EQ. TPS300)) THEN
   REQMT(1,J) = 1
ELSE
   REQMT(1,J) = 0
END IF
$ (TEMP(NDX) .EQ. TPS300)) THEN
  REQMT(2,J) = 1
ELSE
  REQMT(2,J) = 0
END IF

*****************************************************************************
****
* The following statements check for the completion of SYS200
* or its equivalents.
*
*****************************************************************************
****
IF ((TEMP(NDX) .EQ. SYS200) .OR. (TEMP(NDX) .EQ. SAS006)) THEN
  REQMT(3,J) = 1
ELSE
  REQMT(3,J) = 0
END IF

*****************************************************************************
****
* The following statements check for the completion of SYS400
* or its equivalents.
*
*****************************************************************************
****
IF ((TEMP(NDX) .EQ. SYS400) .OR. (TEMP(NDX) .EQ. DSMC01) .OR. (TEMP(NDX) .EQ. DSMC02) .OR. (TEMP(NDX) .EQ. DSMC3A) .OR. (TEMP(NDX) .EQ. DSMC3B) .OR. (TEMP(NDX) .EQ. DSMC20) .OR. (TEMP(NDX) .EQ. DSMC30)) THEN
  REQMT(4,J) = 1
ELSE
  REQMT(4,J) = 0
END IF

IF ((TEMP(NDX) .EQ. SYS225) .OR. (TEMP(NDX) .EQ. ALCO01)) THEN
  REQMT(5,J) = 1
ELSE
  REQMT(5,J) = 0
END IF

127
END IF

*****************************************************************************
* THIS REQUIREMENT WILL BE GRANTED REGARDLESS, SINCE *
* AFIT DOES NOT OFFER THIS COURSE, AND HENCE IT CAN NOT *
* BE APART OF THE IMPACT OF COURSE DEMAND. *
*****************************************************************************

IF ((TEMP(NDX) .EQ. DSMC3A) .OR. $(TEMP(NDX) .EQ. DSMC3B)) THEN
   REQMT(6,J) = 1
ELSE
   REQMT(6,J) = 1
END IF

DO 35 I = 1, 6
   DO 45 J = 1, 34
      TEST(I) = TEST(I) + REQMT(I,J)
   45 CONTINUE
35 CONTINUE

DO 65 S = 1, 6
   IF (TEST(S) .GT. 0) THEN
      CHK(S) = 1
   ELSE
      CHK(S) = 0
   END IF
65 CONTINUE

*****************************************************************************
****
* Using a set list of possible acquisition courses, the next *
* Do-loop check for the number of specialty courses a person *
* has completed. *
*****************************************************************************

DO 20 K = 1, 34
   NDX = K + 16
   OPEN(UNIT=12, FILE='ACQLOG.DAT', STATUS='OLD')
   READ(12,120,END=15) PDS, NUM
   153 IF (TEMP(NDX) .NE. NUM) THEN
      READ(12,120,END=15) PDS, NUM
      GO TO 153
128
END IF
15 IF ((TEMP(NDX) .EQ. NUM) .AND. (TEMP(NDX) .GT. 0)) THEN
    COUNT = COUNT + 1
END IF
CLOSE(12)
20 CONTINUE

IF (COUNT .GE. 1) THEN
    CHK(7) = 1
ELSE
    CHK(7) = 0
END IF

IF (COUNT .GE. 3) THEN
    CHK(8) = 1
ELSE
    CHK(8) = 0
END IF

* The following condition statements assign an evaluated level of certification to each person based on the previous checks for the requirements at each level.

IF (((CHK(1) .EQ. 1) .AND. (CHK(3) .EQ. 1) .AND. (CHK(7) .EQ. 1)) .OR. ((CHK(2) .EQ. 1) .AND. (CHK(7) .EQ. 1)) .OR. ((CHK(3) .EQ. 1) .AND. (CHK(7) .EQ. 1)) .OR. ((CHK(4) .EQ. 1) .AND. (CHK(7) .EQ. 1))) THEN
    ELEVL = ELEVL + 1
    LEVL(1) = 1
ELSE
    LEVL(1) = 0
END IF

IF (((LEVL(1) .EQ. 1) .AND. (CHK(4) .EQ. 1) .AND. (CHK(8) .EQ. 1)) .OR. ((LEVL(1) .EQ. 1) .AND. (CHK(6) .EQ. 1) .AND. (CHK(8) .EQ. 1))) THEN
    ELEVL = ELEVL + 1
    LEVL(2) = 1
ELSE

129
LEVL(2) = 0
END IF

IF ((LEVL(2) .EQ. 1) .AND. (CHK(6) .EQ. 1) .AND. \$ (TEMP(15) .GE. 1)) THEN
    ELEVL = ELEVL + 1
    LEVL(3) = 1
ELSE
    LEVL(3) = 0
END IF

* The following if structure checks to see if the evaluated
* level of certification is greater than the one reported in
* the individual's records. The greater certification level
* will be used during the simulation.
*
IF (ELEVL .GE. TEMP(11)) THEN
    TEMP(61) = ELEVL
ELSE
    TEMP(61) = TEMP(11)
END IF

* The following set of conditional statements compute the
* initial states for backlog population of people, backlog
* demand for courses and total demand for courses.
*
IF ((TEMP(3) .EQ. 1) .AND. (TEMP(13) .GE. 2)) THEN
    TEMP(63) = 1
END IF
IF ((TEMP(3) .GT. TEMP(61)) .AND. (TEMP(63) .EQ. 1)) THEN
    BKLOG = 1
    TEMP(62) = 1
ELSE
    BKLOG = 0
    TEMP(62) = 0
END IF

IF ((LEVL(1) .EQ. 0) .AND. (CHK(1) .EQ. 0) .AND. (CHK(2) .EQ. 0)) THEN
    TEMP(51) = 1
    DMD100 = 1
    CUTOFF = UNFRM(0.0, 1.0, 2)
    IF (CUTOFF .GE. 0.5) THEN
        CRS100 = 1
    END IF
ELSE
    DMD100 = 0
    TEMP(51) = 0
END IF

IF ((LEVL(1) .EQ. 0) .AND. (CHK(3) .EQ. 0) .AND. (CHK(2) .EQ. 0)) THEN
    TEMP(52) = 1
    DMD200 = 1
    CUTOFF = UNFRM(0.0, 1.0, 1)
    IF (CUTOFF .GE. 0.5) THEN
        CRS200 = 1
    END IF
ELSE
    DMD200 = 0
    TEMP(52) = 0
END IF

IF ((LEVL(1) .EQ. 0) .AND. (CHK(7) .EQ. 0)) THEN
    TEMP(53) = 1
    SPCR = 1
ELSE
    SPCR = 0
    TEMP(53) = 0
END IF

IF ((LEVL(2) .EQ. 0) .AND. (CHK(4) .EQ. 0)) THEN
    TEMP(54) = 1
    DMD400 = 1
    CUTOFF = UNFRM(0.0, 1.0, 3)
    IF (CUTOFF .GE. 0.20) THEN
        CRS400 = 1
END IF
END IF
ELSE
   DMD400 = 0
   TEMP(54) = 0
END IF

IF ((LEVL(2) .EQ. 0) .AND. (CHK(5) .EQ. 0)) THEN
   TEMP(55) = 1
   DMD225 = 1
   CUTOFF = UNFRM(0.0, 1.0, 2)
   IF (CUTOFF .GE. 0.5) THEN
      CRS225 = 1
   END IF
ELSE
   DMD225 = 0
   TEMP(55) = 0
END IF

IF ((LEVL(2) .EQ. 0) .AND. (CHK(8) .EQ. 0)) THEN
   TEMP(56) = 1
   SPCRS = SPCRS + 1
ELSE
   TEMP(56) = 0
END IF

IF ((LEVL(3) .EQ. 0) .AND. (CHK(8) .EQ. 0)) THEN
   TEMP(57) = 1
   SPCRS = SPCRS + 1
ELSE
   TEMP(57) = 0
END IF

IF ((LEVL(3) .EQ. 0) .AND. (CHK(6) .EQ. 0)) THEN
   TEMP(58) = 0
   PMC03 = 1
ELSE
   PMC03 = 0
   TEMP(58) = 0
END IF

120 FORMAT(A3, 2X, I4)
RETURN
END

*******************************************************************************
****
* The purpose of subroutine CRSDMD is to keep statistics on
*

132
* the backlog population and course demand.

*  

******************************************************************************************************************
****

SUBROUTINE CRSDMD(BAKLOG, HI100, LO100, HI200, LO200, 
$HI400, LO400, HI225, LO225, DSMC03, YEAR, SPECLY)

INTEGER BAKLOG, HI100, LO100, HI200, LO200, HI400, 
$LO400, HI225, LO225, DSMC03, YEAR, SPECLY

WRITE(50, 220) YEAR, BAKLOG, HI100, LO100, HI200, 
$LO200, HI400, LO400, HI225, LO225, DSMC03, SPECLY

220 FORMAT(I6, 1X, I6, 1X, I5, 1X, I5, 1X, I5, 1X, 
$15, 1X, I5, 1X, I5, 1X, I5, 1X, I5, 1X, I5, 1X, I5)

PRINT *, 'DONE WITH COURSE DEMAND'

RETURN
END

******************************************************************************************************************
****
* The purpose of subroutine STATS is to keep statistics on
* the population of people certified at each level.
*  

******************************************************************************************************************
****

SUBROUTINE STATS
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER YEAR

REAL LEVL1, LEVL2, LEVL3, RLEVL1, RLEVL2, RLEVL3, CORPS, 
$CRIT, DEVELOP, RELATE, NONE, FILLCR, FILLRT, FILLDP

REAL MOCNT1, MOCNT2, MOCNT3, MOCRIT, TTCNT2, TTCNT1, 
$EXCNT3, DPCNT1, DPCNT2, DPCNT3, DPCRIT, EXCNT2, 
$DPRDLT, DPVLDP, EXCNT1, TTNONE, TTCNT3

OPEN(UNIT=35, FILE='LEVEL.OUT',STATUS='NEW')
PRINT *, 'STARTING STATS'
PRINT *, 'STARTING STATS'
LEVL1 = 0
LEVL2 = 0
LEVL3 = 0

133
DO 10 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      YEAR = AUX(I,68)
      IF (AUX(I,61) .EQ. 1) THEN
         LEVL1 = LEVL1 + 1
      ELSE IF (AUX(I,61) .EQ. 2) THEN
         LEVL2 = LEVL2 + 1
      ELSE IF (AUX(I,61) .EQ. 3) THEN
         LEVL3 = LEVL3 + 1
      ELSE IF (AUX(I,61) .EQ. 0) THEN
         NONE = NONE + 1
      END IF
   IF (AUX(I,16) .EQ. 1) THEN
      CORPS = CORPS + 1
   END IF
   IF (AUX(I,4) .EQ. 1) THEN
      FILLCR = FILLCR + 1
   ELSE IF (AUX(I,4) .EQ. 2) THEN
      FILDVP = FILDVP + 1
   ELSE IF (AUX(I,4) .EQ. 3) THEN
      FILRLT = FILRLT + 1
   END IF
10 CONTINUE

DO 20 I = 1, ROWS
   IF (AUX(I,3) .EQ. 1) THEN
      RLEVL1 = RLEVL1 + 1
   ELSE IF (AUX(I,3) .EQ. 2) THEN
      RLEVL2 = RLEVL2 + 1
   ELSE IF (AUX(I,3) .EQ. 3) THEN
      RLEVL3 = RLEVL3 + 1
   END IF

   IF (AUX(I,4) .EQ. 1) THEN
      134
CRIT = CRIT + 1
ELSE IF (AUX(I,4) .EQ. 2) THEN
  DEVELP = DEVELP + 1
ELSE IF (AUX(I,4) .EQ. 3) THEN
  RELATE = RELATE + 1
END IF
20 CONTINUE

*****WORKFORCE POSITION STATISTICS (2 PIE CHARTS)

MOCNT1 = (RLEVL1/ROWS)*100
MOCNT2 = (RLEVL2/ROWS)*100
MOCNT3 = (RLEVL3/ROWS)*100
MOCRIT = (CRIT/ROWS)*100

*****WORKFORCE PERSONNEL STATISTICS (3 BAR CHARTS AND 1 PIE CHART)

IF (RLEVL1 .GT. 0) THEN
  DPCNT1 = (LEVLI/RLEVL1)*100
END IF
IF (RLEVL2 .GT. 0) THEN
  DPCNT2 = (LEVL2/RLEVL2)*100
END IF
IF (RLEVL3 .GT. 0) THEN
  DPCNT3 = (LEVL3/RLEVL3)*100
END IF
IF (RLEVL1 .GT. 0) THEN
  EXCNT1 = ((LEVL1/RLEVL1)/ROWS)*100
END IF
IF (RLEVL2 .GT. 0) THEN
  EXCNT2 = ((LEVL2/RLEVL2)/ROWS)*100
END IF
IF (RLEVL3 .GT. 0) THEN
  EXCNT3 = ((LEVL3/RLEVL3)/ROWS)*100
END IF

*****MEASURE OF TRAINED COMPARED TO WORKFORCE (1 PIE CHARTS)
TTCNT1 = (LEVL1/ROWS)*100
TTCNT2 = (LEVL2/ROWS)*100
TTCNT3 = (LEVL3/ROWS)*100
TTNONE = (NONE/ROWS)*100

*****STATISTICS ON FILLED ACQUISITION POSITIONS (1 PIE CHART)

IF (CRIT .GT. 0) THEN
   DPCRIT = (FILLCR/CRT)*100
END IF

IF (DEVELP .GT. 0) THEN
   DPDVLP = (FILDVP/DEVELP)*100
END IF

IF (RELATE .GT. 0) THEN
   DPRELT = (FILRLT/RELATE)*100
END IF

*****FILE OUTPUT

WRITE(35, 135) YEAR, ROWS
WRITE(35, 145) RLEVL1, LEVL1, RLEVL2, LEVL2, RLEVL3, LEVL3, $CRIT, FILLCR, DEVELP, FILDVP, RELATE, FILRLT
WRITE(35, 155) MOCNT1, MOCNT2, MOCNT3, MOCRIT, DPCNT1, DPCNT2, $DPCNT3, EXCNT1, EXCNT2, EXCNT3
WRITE(35, 165) TTCNT1, TTCNT2, TTCNT3, TTNONE, DPCRIT, DPDVLP, $DPRELT

135 FORMAT(I5, 1X, I6)
145 FORMAT(12(F5.0, 1X))
155 FORMAT(10(F5.2, 1X))
165 FORMAT(7(F5.2, 1X))

PRINT *, 'DONE WITH STATS'
RETURN
END

**************************************************************************************************
****
* The following subroutine is used to attrite people from the
*
* system based on passover promotion opportunities and yearly
* attrition rates for each year of service.
* 
SUBROUTINE ATTRIT
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER NDX1, YR, POP

REAL YOS(28), KILL

CALL SCHDL(26, 365.0, ATRIB)

WRITE(19, *) NNQ(15), ' ENTERED ATTRIT'

YOS(1)  = .9757
YOS(2)  = .9805
YOS(3)  = .9536
YOS(4)  = .8565
YOS(5)  = .8942
YOS(6)  = .9188
YOS(7)  = .9370
YOS(8)  = .9418
YOS(9)  = .9463
YOS(10) = .9590
YOS(11) = .9343
YOS(12) = .9051
YOS(13) = .9919
YOS(14) = .9926
YOS(15) = .9944
YOS(16) = .9843
YOS(17) = .9507
YOS(18) = .9522
YOS(19) = .8827
YOS(20) = .5469
YOS(21) = .5969
YOS(22) = .4072
YOS(23) = .2124
YOS(24) = .1713
YOS(25) = .1493
YOS(26) = .2090
YOS(27) = .0000

DO 10 I = 1, ROWS
IF ((AUX(I,13)) .GT. 28) THEN
  AUX(I,13) = 28
END IF
YR = (AUX(I,13))
KILL = UFRM(0.0, 1.0, 2)
IF ((AUX(I,6) .EQ. 1) .AND. (AUX(I,8) .LT. 7) .AND.
  ((AUX(I,69) .GE. 2) .OR. (KILL .GT. YOS(YR)))) THEN
  POP = NNQ(15)
  DO 19 P = 1, POP
    CALL RMOVE(1, 15, ATRIB)
    IF (ATRIB(7) .EQ. AUX(I,7)) THEN
      DO 20 J = 1, 65
        NDX1 = J + 5
        AUX(I,NDX1) = 0
      20 CONTINUE
      GO TO 10
    ELSE
      CALL FILEM(15, ATRIB)
    END IF
  19 CONTINUE
END IF
10 CONTINUE
WRITE(19, *) NNQ(15), ' LEFT ATTRIT'
PRINT *, 'DONE WITH ATTRIT'
RETURN
END

**********************************************************************
****
* The following routine is used to promote personnel in the
* system based on promotion rates for each rank. Three and
* Four star general officers are promoted based on the
* attrition of other equivalent officers in the system.
**********************************************************************
****

SUBROUTINE PRMOTE
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

138
INTEGER POP, RANK

REAL PRATE(10), PASS, MAJBTZ, MAJABZ, LTCBTZ, LTCABZ,
$ COLBTZ, COLABZ
WRITE(19,*) NNQ(15), ' ENTERED PROMOTE'
CALL SCHDL(25, 365.0, ATRIB)
RANK = 0
PRATE(1) = .97
PRATE(2) = .94
MAJBTZ = .012
PRATE(3) = .673
MAJABZ = .095
LTCBTZ = .025
PRATE(4) = .62
LTCABZ = .059
COLBTZ = .023
PRATE(5) = .427
COLABZ = .032
PRATE(6) = .0135
PRATE(7) = .35

DO 10 I = 1, ROWS
   IF ((AUX(I,6) .EQ. 1) .AND. (AUX(I,8) .LE. 7)) THEN
      POP = NNQ(15)
      DO 19 P = 1, POP
         CALL RMOVE(I, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 21
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
      CONTINUE
   END IF
   PASS = UNFRM(0.0, 1.0, 2)
   IF (((AUX(I,8)) .EQ. 1) .AND. ((AUX(I,13)) .EQ. 2)) THEN
      IF (PASS .LE. PRATE(1)) THEN
         AUX(I,8) = AUX(I,8) + 1
         ATRIB(8) = ATRIB(8) + 1
         CALL FILEM(15, ATRIB)
      ELSE
         AUX(I,69) = AUX(I,69) + 1
         ATRIB(69) = ATRIB(69) + 1
         CALL FILEM(15, ATRIB)
      END IF
   ELSE IF (((AUX(I,8)) .EQ. 2) .AND. ((AUX(I,13)) .EQ. 4)) THEN
      IF (PASS .LE. PRATE(2)) THEN
         AUX(I,8) = AUX(I,8) + 1
         ATRIB(8) = ATRIB(8) + 1
      END IF
   END IF
10 CONTINUE
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 3) .AND.
((AUX(I,13)) .EQ. 11)) THEN
IF (PASS .LE. MAJBTZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 3) .AND.
((AUX(I,13)) .EQ. 12)) THEN
IF (PASS .LE. PRATE(3)) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 3) .AND.
((AUX(I,13)) .GT. 12)) THEN
IF (PASS .LE. MAJABZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 4) .AND.
((AUX(I,13)) .EQ. 15)) THEN
IF (PASS .LE. LTCBTZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 4) .AND.
((AUX(I,13)) .EQ. 16)) THEN
IF (PASS .LE. PRATE(4)) THEN
AUX(I,8) = AUX(I,8) + 1
140
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 4) .AND. $(AUX(I,13)).EQ. 15)) THEN
IF (PASS .LE. LTCABZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 5) .AND. $(AUX(I,13)).EQ. 20)) THEN
IF (PASS .LE. COLBTZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 5) .AND. $(AUX(I,13)).EQ. 21)) THEN
IF (PASS .LE. PRATE(5)) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
ATRIB(69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 6) .AND. $(AUX(I,13)).EQ. 21)) THEN
IF (PASS .LE. COLABZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
AUX(I,69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 6) .AND. $(AUX(I,13)).EQ. 21)) THEN
IF (PASS .LE. PRATE(6)) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
AUX(I,69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 6) .AND. $(AUX(I,13)).EQ. 21)) THEN
IF (PASS .LE. COLABZ) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
AUX(I,69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
END IF
ELSE IF (((AUX(I,8)) .EQ. 6) .AND. $(AUX(I,13)).EQ. 21)) THEN
IF (PASS .LE. PRATE(6)) THEN
AUX(I,8) = AUX(I,8) + 1
ATRIB(8) = ATRIB(8) + 1
CALL FILEM(15, ATRIB)
ELSE
AUX(I,69) = AUX(I,69) + 1
AUX(I,69) = ATRIB(69) + 1
CALL FILEM(15, ATRIB)
$((\text{AUX}(I,13)) \cdot \text{EQ. 24})) \text{ THEN}
\text{IF (PASS} \cdot \text{LE. PRATE(6)) THEN}
\text{AUX}(I,8) = \text{AUX}(I,8) + 1
\text{ATRIB}(8) = \text{ATRIB}(8) + 1
\text{CALL FILEM(15, ATRIB)}
\text{ELSE}
\text{AUX}(I,69) = \text{AUX}(I,69) + 1
\text{ATRIB}(69) = \text{ATRIB}(69) + 1
\text{CALL FILEM(15, ATRIB)}
\text{END IF}
\text{ELSE IF (((AUX}(I,8)) \cdot \text{EQ. 7}) \cdot \text{AND.}
\text{((AUX}(I,13)) \cdot \text{EQ. 26})) \text{ THEN}
\text{IF (PASS} \cdot \text{LE. PRATE(7)) THEN}
\text{AUX}(I,8) = \text{AUX}(I,8) + 1
\text{ATRIB}(8) = \text{ATRIB}(8) + 1
\text{CALL FILEM(15, ATRIB)}
\text{ELSE}
\text{AUX}(I,69) = \text{AUX}(I,69) + 1
\text{ATRIB}(69) = \text{ATRIB}(69) + 1
\text{CALL FILEM(15, ATRIB)}
\text{END IF}
\text{ELSE}
\text{CALL FILEM(15, ATRIB)}
\text{END IF}
\text{END IF}
\text{10 CONTINUE}

The following condition provides acquisition corp membership based on a promotion to at least major and an evaluated certification level of at least 2.

DO 50 I = 1, ROWS
\text{IF (AUX}(I,6) \cdot \text{EQ. 1) THEN}
\text{IF ((AUX}(I,61) \cdot \text{GE. 2}) \cdot \text{AND. (AUX}(I,8) \cdot \text{GE. 4})) \text{ THEN}
\text{AUX}(I,16) = 1
\text{END IF}
\text{END IF}
50 CONTINUE

DO 60 I = 1, NNQ(15)
\text{CALL RMOVE(1, 15, ATRIB)}
\text{IF ((ATRIB}(61) \cdot \text{GE. 2}) \cdot \text{AND. (ATRIB}(8) \cdot \text{GE. 4})) \text{ THEN}
Arib(16) = 1
CALL FILEM(15, ATRIB)
ELSE
CALL FILEM(15, ATRIB)
END IF
60 CONTINUE
WRITE(19, *) NNQ(15), ' LEFT PROMOTE'
RETURN
END

***********************************************************************
****
* The purpose of subroutine ACCESS is to bring new second *
* lieutenants in the system for simulation purposes. Each new *
* lieutenan will have identical attributes. They will be *
* accessed according the military acquisition career field *
* accession rate. Vacant positions will be searched for *
* lieutenant requirements and filled according to the career *
* field rate.
*
***********************************************************************
****

SUBROUTINE ACCESS
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

REAL NEW, SCHOOL, PERCNT
INTEGER NDX1, POP, NEED, CURRNT, GOAL, FILL

CALL SCHDL(27, 365.0, ATRIB)

***********************************************************************
***
* The following code calculated the number of accessions *
* required to maintain 85% manning of acquisition positions.
*

143
* If the goal is under, and lieutenant positions are vacant, *
* accessions are made, else no accessions are made. *

```fortran
***
WRITE(19, *) NNQ(15), ' ENTERED ACCESS'  
FILL = 0  
PERCNT = 85.0  
GOAL = NINT(PERCNT*ROWS)  
CURRNT = NNQ(15)  
NEED = GOAL - CURRNT

DO 10 I = 1, ROWS  
IF ((NEED .GT. 0) .AND. (FILL .LE. NEED)) THEN  
   IF ((AUX(I,6) .EQ. 0) .AND. ((AUX(I,2) .EQ. 1) .OR. (AUX(I,2) .EQ. 2))) THEN  
      DO 20 J = 1, 65  
         NDX1 = J + 5  
         AUX(I,NDX1) = 0  
20      CONTINUE  
   AUX(I,6) = 1  
   AUX(I,7) = AUX(I,1)  
   AUX(I,8) = 1  
   AUX(I,9) = 1  
   AUX(I,10) = NINT(UNFRM(1.0, 22.0, 2))  
   AUX(I,13) = 1  
   SCHOOL = UNFRM(0.0, 1.0, 2)  
   IF (SCHOOL .GE. 0.5) THEN  
      AUX(I,15) = 1  
   ELSE  
      AUX(I,15) = 2  
   END IF  
   AUX(I,16) = 0  
   AUX(I,11) = 1  
   AUX(I,12) = AUX(I,5)  
   AUX(I,63) = 0  
   AUX(I,68) = NINT(TNOW/365) + 1992  
   NEW = UNFRM(0.0, 1.0, 2)  
   IF (NEW .GT. .5) THEN  
      AUX(I,14) = 0  
   ELSE  
      AUX(I,14) = 1  
   END IF  
   POP = NNQ(15)  
   DO 19 P = 1, POP  
      CALL RMOVE(1, 15, ATRIB)  
      IF (ATRIB(7) .EQ. AUX(I,7)) THEN  
         144
```

* POP = NNQ(15)  
* DO 19 P = 1, POP  
* CALL RMOVE(1, 15, ATRIB)  
* IF (ATRIB(7) .EQ. AUX(I,7)) THEN  
144
*GO TO 21
*ELSE
*CALL FILEM(15, ATRIB)
*END IF
21 DO 15 L = 1, 70
   ATRIB(L) = AUX(I,L)
15 CONTINUE
   CALL FILEM(15, ATRIB)
   END IF
   FILL = FILL + 1
   END IF
10 CONTINUE
   WRITE(19, *) NNQ(15), ' LEFT ACCESS'
   RETURN
END

*******************
****
* The following routine represents the selective early retire-
*ment boards (SERB). A board will be conducted each year for
*the next five years and then this subroutine will become
*inactive.
*
*******************
****
SUBROUTINE SERB
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER NDX1, POP

REAL OUT

WRITE(19, *) NNQ(15), ' ENTERED SERB'
IF (ICOUNT .LT. 6) THEN
   CALL SCHDL(30, 365.0, ATRIB)
   ICOUNT = ICOUNT + 1
END IF

DO 10 I = 1, ROWS
   OUT = UNFRM(0.0, 1.0, 2)
   IF (((AUX(I, 8) .EQ. 3) .OR. (AUX(I,8) .EQ. 4)) .AND. $  (AUX(I,13) .GE. 20) .AND. (OUT .LE. 0.30)) THEN
      POP = NNQ(15)
DO 19 P = 1, POP
    CALL RMOVE(1, 15, ATRIB)
    IF (ATRIB(7) .EQ. AUX(I,7)) THEN
        GO TO 21
    ELSE
        CALL FILEM(15, ATRIB)
    END IF
19 CONTINUE
21 DO 20 J = 1, 65
    NDX1 = J + 5
    AUX(I,NDX1) = 0
20 CONTINUE
END IF
10 CONTINUE
WRITE(19, *) NNQ(15), ' LEFT SERB'
RETURN
END

*****************************************************************************
****
* Subroutine BATCH is used to collect all entities from the
* various school files and place them in file 15. This action*
* is in preparation for the different population routines such*
* promotions and attritions which require all entities to be
* in a single file.
*
*****************************************************************************
****

SUBROUTINE BATCH
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER POP, NDX1, YEAR
WRITE(19, *) NNQ(15), 'ENTERED BATCH'
CALL SCHDL(36, 365.0, ATRIB)
    YEAR = NINT(TNOW/365) + 1992

IF (NNQ(11) .GT. 0) THEN
    DO 15 I = 1, NNQ(11)
        CALL RMOVE(1, 11, ATRIB)
        CALL FILEM(15, ATRIB)
15    CONTINUE
END IF
IF (NNQ(21) .GT. 0) THEN
  DO 20 I = 1, NNQ(21)
      CALL RMOVE(I, 21, ATRIB)
      CALL FILEM(15, ATRIB)
  20 CONTINUE
END IF

IF (NNQ(25) .GT. 0) THEN
  DO 30 I = 1, NNQ(25)
      CALL RMOVE(I, 25, ATRIB)
      CALL FILEM(15, ATRIB)
  30 CONTINUE
END IF

IF (NNQ(41) .GT. 0) THEN
  DO 40 I = 1, NNQ(41)
      CALL RMOVE(I, 41, ATRIB)
      CALL FILEM(15, ATRIB)
  40 CONTINUE
END IF

IF (NNQ(31) .GT. 0) THEN
  DO 50 I = 1, NNQ(31)
      CALL RMOVE(I, 31, ATRIB)
      CALL FILEM(15, ATRIB)
  50 CONTINUE
END IF

IF (NNQ(1) .GT. 0) THEN
  DO 60 I = 1, NNQ(1)
      CALL RMOVE(I, 1, ATRIB)
      CALL FILEM(15, ATRIB)
  60 CONTINUE
END IF

IF (NNQ(2) .GT. 0) THEN
  DO 70 I = 1, NNQ(2)
      CALL RMOVE(I, 2, ATRIB)
      CALL FILEM(15, ATRIB)
  70 CONTINUE
END IF

IF (NNQ(22) .GT. 0) THEN
  DO 80 I = 1, NNQ(22)
      CALL RMOVE(I, 22, ATRIB)
      CALL FILEM(15, ATRIB)
  80 CONTINUE
END IF

IF (NNQ(3) .GT. 0) THEN

147
DO 90 I = 1, NNQ(3)
   CALL RMOVE(1, 3, ATRIB)
   CALL FILEM(15, ATRIB)
   CONTINUE
END IF

IF (NNQ(4) .GT. 0) THEN
   DO 100 I = 1, NNQ(4)
      CALL RMOVE(1, 4, ATRIB)
      CALL FILEM(15, ATRIB)
   CONTINUE
END IF

WRITE(19,*) NNQ(15), ' LEFT BATCH'
OPEN(UNIT=27,FILE='TRNG.OUT', STATUS='NEW')
WRITE(27, *) 'TRAINING CAPABILITY FOR SYS100'
WRITE(27, *) YEAR, GD100
WRITE(27, *) 'TRAINING CAPABILITY FOR SYS200'
WRITE(27, *) YEAR, GD200
WRITE(27, *) 'TRAINING CAPABILITY FOR SYS400'
WRITE(27, *) YEAR, GD400
WRITE(27, *) 'TRAINING CAPABILITY FOR SYS225'
WRITE(27, *) YEAR, GD225
WRITE(27, *) 'TRAINING CAPABILITY FOR SPECIALTY COURSES'
WRITE(27, *) YEAR, GDSPL
WRITE(19, *) 'CHECKING THE SCHOOL AND GRADUATION ROUTINES'
WRITE(19, *) CNT100, ' ENTERED SYS100'
WRITE(19, *) GD100, ' LEFT SYS100'
WRITE(19, *) CNT200, ' ENTERED SYS200'
WRITE(19, *) GD200, ' LEFT SYS200'
RETURN
END

********************************************************************
* Subroutine UPDATE is used to update critical attributes of *
* personnel that is not updated during the regular simulation *
* and other support routines.                                     *
********************************************************************
SUBROUTINE UPDATE
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER POP, NDX1, NDX2, CHK

CALL SCHDL(29, 365.0, ATRIB)

* The following condition updates the years of service, calendar*
* year and provides an educational level of masters by the *
* eighth year of service.

WRITE(19, *) NNQ(15), ' ENTERED UPDATE'
DO 10 I = 1, ROWS
   IF ((AUX(I,6)) .EQ. 1) THEN
      AUX(I,13) = AUX(I,13) + 1
      AUX(I,68) = AUX(I,68) + 1
      IF ((AUX(I,13) .GE. 8) .AND. (AUX(I,15) .LT. 1)) THEN
         AUX(I,15) = 1
      END IF
   END IF
10 CONTINUE

WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 1'

POP = NNQ(15)
DO 194 P = 1, POP
   CALL RMOVE(I, 15, ATRIB)
   ATRIB(13) = ATRIB(13) + 1
   ATRIB(68) = ATRIB(68) + 1
   IF ((ATRIB(13) .GE. 8) .AND. (ATRIB(15) .LT. 1)) THEN
      ATRIB(15) = 1
   END IF
194 CONTINUE

WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 2'

DO 25 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 19 P = 1, POP
         CALL RMOVE(1, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            149
GO TO 21
ELSE
CALL FILEM(15, ATRIB)
END IF
CONTINUE
19 IF ((ATRIB(16) .EQ. 1) .AND. (ATRIB(4) .NE. 1)) THEN
CALL FILEM(13, ATRIB)
ELSE
CALL FILEM(15, ATRIB)
END IF
END IF
25 CONTINUE
* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 3'
DO 35 I = 1, ROWS
 IF ((AUX(I,6) .EQ. 0) .AND. ((AUX(I,4)) .EQ. 1)) THEN
   IF (NNQ(13) .GT. 0) THEN
     DO 26 K = 1, NNQ(13)
      CALL RMOVE(1, 13, ATRIB)
      IF (ATRIB(61) .GE. AUX(I,3)) THEN
        DO 1045 A = 1, ROWS
         IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
           DO 1047 Z = 1, 65
            NDX1 = Z + 5
            AUX(A,NDX1) = 0
           1047 CONTINUE
          GO TO 1046
      1045 CONTINUE
      ATRIB(1) = AUX(I,1)
      ATRIB(2) = AUX(I,2)
      ATRIB(3) = AUX(I,3)
      ATRIB(4) = AUX(I,4)
      ATRIB(5) = AUX(I,5)
      ATRIB(6) = 1
      AUX(I,6) = 1
     DO 45 J = 1, 64
      NDX2 = J + 6
      AUX(I,NDX2) = ATRIB(NDX2)
     45 CONTINUE
     CALL FILEM(15, ATRIB)
     IF (NNQ(14) .GT. 0) THEN
      DO 46 L = 1, NNQ(14)
       CALL RMOVE(1, 14, ATRIB)
      CALL FILEM(13, ATRIB)
     46 CONTINUE
    END IF
   ELSE
 150
CALL FILEM(14, ATRIB)
END IF
26 CONTINUE
END IF
IF (NNQ(14) .GT. 0) THEN
DO 47 L = 1, NNQ(14)
   CALL RMOVE(I, 14, ATRIB)
   CALL FILEM(13, ATRIB)
47 CONTINUE
END IF
END IF
35 CONTINUE
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 4'
IF (NNQ(13) .GT. 0) THEN
   NDX1 = NNQ(13)
   DO 55 I = 1, NDX1
      CALL RMOVE(1,13,ATRIB)
      CALL FILEM(15, ATRIB)
55 CONTINUE
END IF
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK4.5'
DO 65 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 119 P = 1, POP
         CALL RMOVE(I, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 121
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
119 CONTINUE
121 IF (((ATRIB(2) .EQ. 9) .AND. (ATRIB(8) .GE. 9)) THEN
      CALL FILEM(13, ATRIB)
   ELSE
      CALL FILEM(15, ATRIB)
   END IF
65 CONTINUE
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 5'
DO 75 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .EQ. 10)) THEN
      IF (NNQ(13) .GT. 0) THEN
         151
DO 76 K = 1, NNQ(13)
   CALL RMOVE(1, 13, ATRIB)
   IF (ATRIB(61) .GE. AUX(I,3)) THEN
      DO 1001 A = 1, ROWS
         IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
            DO 1002 Z = 1, 65
               NDX1 = Z + 5
               AUX(A,NDX1) = 0
            1002 CONTINUE
            GO TO 1003
         END IF
      1001 CONTINUE
      1003 ATRIB(1) = AUX(I,1)
      ATRIB(2) = AUX(I,2)
      ATRIB(3) = AUX(I,3)
      ATRIB(4) = AUX(I,4)
      ATRIB(5) = AUX(I,5)
      ATRIB(6) = 1
      AUX(I,6) = 1
      DO 85 J = 1, 64
         NDX1 = J + 6
         AUX(I,J) = ATRIB(J)
      85 CONTINUE
      CALL FILEM(15, ATRIB)
      IF (NNQ(14) .GT. 0) THEN
         DO 86 L = 1, NNQ(14)
            CALL RMOVE(I, 14, ATRIB)
            CALL FILEM(13, ATRIB)
         86 CONTINUE
      END IF
   ELSE
      CALL FILEM(14, ATRIB)
   END IF
76 CONTINUE
   IF (NNQ(14) .GT. 0) THEN
      DO 87 L = 1, NNQ(14)
         CALL RMOVE(1, 14, ATRIB)
         CALL FILEM(13, ATRIB)
      87 CONTINUE
   END IF
75 CONTINUE
   WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 6'
   IF (NNQ(13) .GT. 0) THEN
      NDX1 = NNQ(13)
      DO 88 I = 1, NDX1
   88 CONTINUE
152
CALL RMOVE(1,13,ATRIB)
CALL FILEM(15, ATRIB)

88    CONTINUE
END IF

*    WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 7'
DO 95 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 219 P = 1, POP
         CALL RMOVE(I, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 221
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
      219 CONTINUE
   221 IF ((ATRIB(2) .EQ. 8) .AND. (ATRIB(8) .GE. 8)) THEN
      CALL FILEM(13, ATRIB)
   ELSE
      CALL FILEM(15, ATRIB)
   END IF
95    CONTINUE

*    WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 8'
DO 105 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 9)) THEN
      IF (NNQ(13) .GT. 0) THEN
         DO 106 K = 1, NNQ(13)
            CALL RMOVE(1, 13, ATRIB)
            IF (ATRIB(61) .GE. AUX(I,3)) THEN
               DO 1004 A = 1, ROWS
                  IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                     DO 1005 Z = 1, 65
                        NDX1 = Z + 5
                        AUX(A,NDX1) = 0
                     1005 CONTINUE
                  1004 CONTINUE
               ATRIB(1) = AUX(I,1)
               ATRIB(2) = AUX(I,2)
               ATRIB(3) = AUX(I,3)
               ATRIB(4) = AUX(I,4)
         1006 CONTINUE
      END IF
   1004 CONTINUE
  1006 CONTINUE

ATRIB(5) = AUX(I,5)
ATRIB(6) = 1
AUX(I,6) = 1
DO 115 J = 1, 64
   NDX1 = J + 6
   AUX(I,J) = ATRIB(J)
115 CONTINUE
CALL FILEM(15, ATRIB)
IF (NNQ(14) .GT. 0) THEN
   DO 116 L = 1,NNQ(14)
      CALL RMOVE(1, 14, ATRIB)
      CALL FILEM(13, ATRIB)
116 CONTINUE
END IF
ELSE
   CALL FILEM(14, ATRIB)
END IF
106 CONTINUE
IF (NNQ(14) .GT. 0) THEN
   DO 125 I = 1,NDX1
      CALL RMOVE(1,13,ATRIB)
      CALL FILEM(15, ATRIB)
125 CONTINUE
END IF
* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 9'
IF (NNQ(13) .GT. 0) THEN
   NDX1 = NNQ(13)
   DO 125 I = 1, NDX1
      CALL RMOVE(1,13, ATRIB)
      CALL FILEM(15, ATRIB)
125 CONTINUE
END IF
* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 10'
DO 135 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 319 P = 1, POP
         CALL RMOVE(1, 15, ATRIB)
      CALL FILEM(15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 321
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
319 CONTINUE
135 CONTINUE
321 IF ((ATRIB(2) .EQ. 7) .AND. (ATRIB(8) .GE. 7)) THEN
    CALL FILEM(13, ATRIB)
ELSE
    CALL FILEM(15, ATRIB)
END IF
135 CONTINUE

* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 11'

DO 145 I = 1, ROWS
    IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 8)) THEN
        IF (NNQ(13) .GT. 0) THEN
            DO 146 K = 1, NNQ(13)
                CALL RMOVE(I, 13, ATRIB)
                IF (ATRIB(61) .GE. AUX(I,3)) THEN
                    DO 1007 A = 1, ROWS
                        IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                            DO 1008 Z = 1, 65
                                NDX1 = Z + 5
                                AUX(A,NDX1) = 0
                            1008 CONTINUE
                        END IF
                    1007 CONTINUE
                    ATRIB(1) = AUX(I,1)
                    ATRIB(2) = AUX(I,2)
                    ATRIB(3) = AUX(I,3)
                    ATRIB(4) = AUX(I,4)
                    ATRIB(5) = AUX(I,5)
                    ATRIB(6) = 1
                    AUX(I,6) = 1
                    DO 155 J = 1, 64
                        NDX1 = J + 6
                        AUX(I,J) = ATRIB(J)
                    155 CONTINUE
                    CALL FILEM(15, ATRIB)
                END IF
            IF (NNQ(14) .GT. 0) THEN
                DO 156 L = 1, NNQ(14)
                    CALL RMOVE(I, 14, ATRIB)
                    CALL FILEM(13, ATRIB)
                156 CONTINUE
            END IF
        END IF
    ELSE
        CALL FILEM(14, ATRIB)
    END IF
END IF
CONTINUE
IF (NNQ(14) .GT. 0) THEN
  DO 157 L = 1, NNQ(14)
    CALL RMOVE(1, 14, ATRIB)
    CALL FILEM(13, ATRIB)
  CONTINUE
END IF
END IF
END IF
CONTINUE
* *
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 12'
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 13'
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 14'
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 14'
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 14'
*
CALL RMOVE(1, 13, ATRIB)

IF (ATRIB(61) .GE. AUX(I,3)) THEN
  DO 1010 A = 1, ROWS
    IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
      DO 1011 Z = 1, 65
        NDX1 = Z + 5
        AUX(A,NDX1) = 0
      1011 CONTINUE
    GO TO 1012
  END IF
  1010 CONTINUE
  1012 ATRIB(1) = AUX(I,1)
  ATRIB(2) = AUX(I,2)
  ATRIB(3) = AUX(I,3)
  ATRIB(4) = AUX(I,4)
  ATRIB(5) = AUX(I,5)
  ATRIB(6) = 1
  AUX(I,6) = 1
  DO 195 J = 1, 64
    NDX1 = J + 6
    AUX(I,J) = ATRIB(J)
  195 CONTINUE
  CALL FILEM(15, ATRIB)
  IF (NNQ(14) .GT. 0) THEN
    DO 196 L = 1,NNQ(14)
      CALL RMOVE(1, 14, ATRIB)
      CALL FILEM(13, ATRIB)
    196 CONTINUE
  ELSE
    CALL FILEM(14, ATRIB)
  END IF
  186 CONTINUE
  IF (NNQ(14) .GT. 0) THEN
    IF (NNQ(14) .GT. 0) THEN
      DO 197 L = 1,NNQ(14)
        CALL RMOVE(1, 14, ATRIB)
        CALL FILEM(13, ATRIB)
      197 CONTINUE
      END IF
    END IF
  END IF
  185 CONTINUE
  WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 15'
  IF (NNQ(13) .GT. 0) THEN
    NDX1 = NNQ(13)
    DO 205 I = 1, NDX1
      CALL RMOVE(1,13,ATRIB)
      CALL FILEM(15, ATRIB)
    205 CONTINUE
  END IF
END IF
END IF
END IF

* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 16'

DO 215 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 519 P = 1, POP
         CALL RMOVE(I, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 521
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
      CONTINUE
   END IF
215 CONTINUE
* WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 17'

DO 225 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 6)) THEN
      IF (NNQ(13) .GT. 0) THEN
         DO 226 K = 1, NNQ(13)
            CALL RMOVE(I, 13, ATRIB)
            IF (ATRIB(61) .GE. AUX(I,3)) THEN
               DO 1013 A = 1, ROWS
                  IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                     DO 1014 Z = 1, 65
                        NDX1 = Z + 5
                        AUX(A,NDX1) = 0
                     CONTINUE
                     GO TO 1015
                  END IF
               CONTINUE
            END IF
         CONTINUE
      END IF
   THEN
      IF (NNQ(13) .GT. 0) THEN
         CALL RMOVE(I, 13, ATRIB)
         IF (ATRIB(61) .GE. AUX(I,3)) THEN
            DO 1013 A = 1, ROWS
               IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                  DO 1014 Z = 1, 65
                     NDX1 = Z + 5
                     AUX(A,NDX1) = 0
                  CONTINUE
                  GO TO 1015
               END IF
            CONTINUE
         END IF
      END IF
1014 CONTINUE
      GO TO 1015
   END IF
1013 CONTINUE
1015 ATRIB(1) = AUX(I,1)
ATRIB(2) = AUX(I,2)
ATRIB(3) = AUX(I,3)
ATRIB(4) = AUX(I,4)
ATRIB(5) = AUX(I,5)
ATRIB(6) = 1
AUX(I,6) = 1
DO 235 J = 1, 64
   NDX1 = J + 6
   235 CONTINUE
AUX(I,J) = ATRIB(J)
CONTINUE
CALL FILEM(15, ATRIB)
IF (NNQ(14) .GT. 0) THEN
  DO 236 L = 1,NNQ(14)
    CALL RMOVE(1, 14, ATRIB)
    CALL FILEM(13, ATRIB)
  CONTINUE
END IF
ELSE
  CALL FILEM(14, ATRIB)
END IF
CONTINUE
IF (NNQ(14) .GT. 0) THEN
  DO 237 L = 1,NNQ(14)
    CALL RMOVE(1, 14, ATRIB)
    CALL FILEM(13, ATRIB)
  CONTINUE
END IF
END IF
END IF
CONTINUE
*    WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 18'
IF (NNQ(13) .GT. 0) THEN
  NDX1 = NNQ(13)
  DO 245 I = 1, NDX1
    CALL RMOVE(1,13,ATRIB)
    CALL FILEM(15, ATRIB)
  CONTINUE
END IF
*    WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 19'
DO 255 I = 1, ROWS
  IF (AUX(I,6) .EQ. 1) THEN
    POP = NNQ(15)
    DO 619 P = 1, POP
      CALL RMOVE(1, 15, ATRIB)
      IF (ATRIB(7) .EQ. AUX(I,7)) THEN
        GO TO 621
      ELSE
        CALL FILEM(15, ATRIB)
      END IF
    CONTINUE
    619 CONTINUE
    621 IF ((ATRIB(2) .EQ. 4) .AND. (ATRIB(8) .GE. 4)) THEN
      CALL FILEM(13, ATRIB)
    ELSE
      159
CALL FILEM(15, ATRIB)
END IF
END IF
255 CONTINUE

*    WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 20'

DO 265 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 5)) THEN
      IF (NNQ(13) .GT. 0) THEN
         DO 266 K = 1, NNQ(13)
            CALL RMOVE(1, 13, ATRIB)
            IF (ATRIB(61) .GE. AUX(I,3)) THEN
               DO 1016 A = 1, ROWS
                  IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                     DO 1017 Z = 1, 65
                        NDX1 = Z + 5
                        AUX(A,NDX1) = 0
                     1017 CONTINUE
                     GO TO 1018
                  END IF
               1016 CONTINUE
            END IF
         1018 ATRIB(1) = AUX(I,1)
         ATRIB(2) = AUX(I,2)
         ATRIB(3) = AUX(I,3)
         ATRIB(4) = AUX(I,4)
         ATRIB(5) = AUX(I,5)
         ATRIB(6) = 1
         AUX(I,6) = 1
         DO 275 J = 1, 64
            NDX1 = J + 6
            AUX(I,J) = ATRIB(J)
         275 CONTINUE
         CALL FILEM(15, ATRIB)
      ELSE
         CALL FILEM(14, ATRIB)
      END IF
   266 CONTINUE
   IF (NNQ(14) .GT. 0) THEN
      DO 276 L = 1, NNQ(14)
         CALL RMOVE(1, 14, ATRIB)
         CALL FILEM(13, ATRIB)
      276 CONTINUE
   ELSE
      CALL FILEM(14, ATRIB)
   END IF
END IF
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 20'

IF (NNQ(13) .GT. 0) THEN
   NDX1 = NNQ(13)
   DO 285 I = 1, NDX1
      CALL RMOVE(1, 13, ATRIB)
      CALL FILEM(15, ATRIB)
   285 CONTINUE
END IF

WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 21'

DO 295 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 719 P = 1, POP
         CALL RMOVE(I, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 721
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
      719 CONTINUE
   721 IF ((ATRIB(2) .EQ. 3) .AND. (ATRIB(8) .GE. 3)) THEN
      CALL FILEM(13, ATRIB)
   ELSE
      CALL FILEM(15, ATRIB)
   END IF
  295 CONTINUE

WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 22'

DO 305 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 4)) THEN
      IF (NNQ(13) .GT. 0) THEN
         DO 306 K = 1, NNQ(13)
            CALL RMOVE(1, 13, ATRIB)
            IF (ATRIB(61) .GE. AUX(I,3)) THEN
               DO 1019 A = 1, ROWS
                  IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                     DO 1020 Z = 1, 65
                        $
NDX1 = Z + 5
AUX(A,NDX1) = 0

1020 CONTINUE
GO TO 1021
END IF
1019 CONTINUE
1021
ATRIB(1) = AUX(I,1)
ATRIB(2) = AUX(I,2)
ATRIB(3) = AUX(I,3)
ATRIB(4) = AUX(I,4)
ATRIB(5) = AUX(I,5)
ATRIB(6) = 1
AUX(I,6) = 1
DO 315 J = 1, 64
    NDX1 = J + 6
    AUX(I,J) = ATRIB(J)
315 CONTINUE
CALL FILEM(15, ATRIB)
IF (NNQ(14) .GT. 0) THEN
    DO 316 L = 1,NNQ(14)
        CALL RMOVE(1, 14, ATRIB)
        CALL FILEM(13, ATRIB)
    316 CONTINUE
ELSE
    CALL FILEM(14, ATRIB)
END IF
306 CONTINUE
IF (NNQ(14) .GT. 0) THEN
    DO 317 L = 1,NNQ(14)
        CALL RMOVE(1, 14, ATRIB)
        CALL FILEM(13, ATRIB)
    317 CONTINUE
END IF
END IF
305 CONTINUE
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 23'

IF (NNQ(13) .GT. 0) THEN
    NDX1 = NNQ(13)
    DO 325 I = 1, NDX1
        CALL RMOVE(1,13,ATRIB)
        CALL FILEM(15, ATRIB)
    325 CONTINUE
END IF
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 24'

162
DO 335 I = 1, ROWS
   IF (AUX(I,6) .EQ. 1) THEN
      POP = NNQ(15)
      DO 819 P = 1, POP
         CALL RMOVE(1, 15, ATRIB)
         IF (ATRIB(7) .EQ. AUX(I,7)) THEN
            GO TO 821
         ELSE
            CALL FILEM(15, ATRIB)
         END IF
      END DO
      819 CONTINUE
   ELSE
      CALL FILEM(13, ATRIB)
   END IF
   END IF
335 CONTINUE
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 25'
DO 345 I = 1, ROWS
   IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 3)) THEN
      IF (NNQ(13) .GT. 0) THEN
         DO 346 K = 1, NNQ(13)
            CALL RMOVE(1, 13, ATRIB)
            IF (AUX(A,6) .EQ. AUX(I,3)) THEN
               DO 1022 A = 1, ROWS
                  IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                     DO 1023 Z = 1, 65
                        NDX1 = Z + 5
                        AUX(A,NDX1) = 0
                     END DO
                     GO TO 1024
                  END IF
               END DO
               ATRIB(1) = AUX(I,1)
               ATRIB(2) = AUX(I,2)
               ATRIB(3) = AUX(I,3)
               ATRIB(4) = AUX(I,4)
               ATRIB(5) = AUX(I,5)
               ATRIB(6) = 1
               AUX(I,6) = 1
               DO 355 J = 1, 64
                  NDX1 = J + 6
                  AUX(I,NDX1) = ATRIB(J)
            END IF
         END IF
5 CONTINUE
   END IF
345 CONTINUE
}
DO 356 L = 1, NNQ(14)
    CALL RMOVE(1, 14, ATRIB)
    CALL FILEM(13, ATRIB)
356        CONTINUE
END IF
ELSE
    CALL FILEM(14, ATRIB)
END IF
346        CONTINUE
IF (NNQ(14) .GT. 0) THEN
    DO 357 L = 1, NNQ(14)
        CALL RMOVE(I, 14, ATRIB)
        CALL FILEM(13, ATRIB)
357        CONTINUE
END IF
END IF
345        CONTINUE
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 26'
IF (NNQ(13) .GT. 0) THEN
    NDX1 = NNQ(13)
    DO 365 I = 1, NDX1
        CALL RMOVE(I, 13, ATRIB)
        CALL FILEM(15, ATRIB)
365        CONTINUE
END IF
*
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 27'
DO 375 I = 1, ROWS
    IF (AUX(I, 6) .EQ. 1) THEN
        POP = NNQ(15)
        DO 919 P = 1, POP
            CALL RMOVE(I, 15, ATRIB)
            IF (ATRIB(7) .EQ. AUX(I, 7)) THEN
                GO TO 921
            ELSE
                CALL FILEM(15, ATRIB)
                END IF
919        CONTINUE
921        IF ((ATRIB(2) .EQ. 1) .AND. (ATRIB(8) .GE. 1)) THEN
                CALL FILEM(13, ATRIB)
            ELSE
                CALL FILEM(15, ATRIB)
            END IF
375        CONTINUE
164
WRITE(19, *) NNQ(15), ' PEOPLE AT CHECK 28'

DO 395 I = 1, ROWS
    IF (((AUX(I,6)) .EQ. 0) .AND. ((AUX(I,2)) .GE. 2)) THEN
        IF (NNQ(13) .GT. 0) THEN
            DO 396 K = 1, NNQ(13)
                CALL RMOVE(1, 13, ATRIB)
                IF (ATRIB(61) .GE. AUX(I,3)) THEN
                    DO 1025 A = 1, ROWS
                        IF ((AUX(A,6) .EQ. 1) .AND. (AUX(A,7) .EQ. ATRIB(7))) THEN
                            DO 1026 Z = 1, 65
                                NDX1 = Z + 5
                                AUX(A,NDX1) = 0
                            1026 CONTINUE
                            GO TO 1027
                        END IF
                    1025 CONTINUE
                    ATRIB(1) = AUX(I,1)
                    ATRIB(2) = AUX(I,2)
                    ATRIB(3) = AUX(I,3)
                    ATRIB(4) = AUX(I,4)
                    ATRIB(5) = AUX(I,5)
                    ATRIB(6) = 1
                    AUX(I,6) = 1
                    DO 405 J = 1, 64
                        NDX1 = J + 6
                        AUX(I,J) = ATRIB(J)
                    405 CONTINUE
                    CALL FILEM(15, ATRIB)
                    IF (NNQ(14) .GT. 0) THEN
                        DO 406 L = 1, NNQ(14)
                            CALL RMOVE(1, 14, ATRIB)
                            CALL FILEM(13, ATRIB)
                        406 CONTINUE
                        END IF
                    ELSE
                        CALL FILEM(14, ATRIB)
                    END IF
                ELSE
                    CALL FILEM(14, ATRIB)
                END IF
            396 CONTINUE
        ELSE
            CALL FILEM(15, ATRIB)
        END IF
    END IF
395 CONTINUE
* WRITE(19, *) NNQ(15), 'PEOPLE AT CHECK 29'

IF (NNQ(13) .GT. 0) THEN
    NDX1 = NNQ(13)
    DO 415 I = 1, NDX1
        CALL RMOVE(I,13,ATRIB)
        CALL FILEM(15, ATRIB)
    415   CONTINUE
END IF

** WRITE(19, *) NNQ(15), 'PEOPLE AT CHECK 30'

WRITE(19, *) NNQ(15), ' LEFT UPDATE'
WRITE(19, *) CANCEL, 'CLASSES WERE CANCELLED THIS YEAR'
CANCEL = 0
CALL SCHDL(31, 2.0, ATRIB)
RETURN
END

******************************************************************************
**** The following routine is used to schedule training for class*
* SYS100 class 1 of two per year.
*
******************************************************************************
****

SUBROUTINE SYS100A
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ1, NUMQ11, QUOTA1, QUOTA2

REAL PERCNT

CALL SCHDL(2, 365.0, ATRIB)

SIZE = 45
NUMQ1 = NNQ(1)
NUMQ11 = NNQ(11)
PERCENT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ1 + NUMQ11
IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ11 .GE. TYPE1) .AND. (NUMQ1 .GE. TYPE2))
        THEN
            QUOTA1 = TYPE1

166
QUOTA2 = TYPE2
DO 10 I = 1, QUOTA1
   CALL RMOVE(1, 11, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
DO 20 J = 1, ROWS
   IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(10, ATRIB)
      CNT100 = CNT100 + 1
      CALL SCHDL(28, 7.0, ATRIB)
   GO TO 10
END IF
20 CONTINUE
10 CONTINUE
DO 30 I = 1, QUOTA2
   CALL RMOVE(1, 1, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
      GO TO 30
      END IF
40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQII .GT. 0) .AND. (NUMQII .LT. TYPE1))
   THEN
      QUOTA1 = NUMQII
      QUOTA2 = SIZE - QUOTA1
      DO 50 I = 1, QUOTA1
         CALL RMOVE(1, 11, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(10, ATRIB)
            CNT100 = CNT100 + 1
            CALL SCHDL(28, 7.0, ATRIB)
         GO TO 50
      END IF
60 CONTINUE
50 CONTINUE
50 CONTINUE
DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 1, ATRIB)
   ATRIB(70) = 1
70 CONTINUE
ATRIB(65) = TNOW
DO 80 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(10, ATRIB)
      CNT100 = CNT100 + 1
      CALL SCHDL(28, 7.0, ATRIB)
      GO TO 70
   END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQI .GT. 0) .AND. (NUMQI .LT. TYPE2)) THEN
   QUOTA2 = NUMQI
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(I, 11, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 90
      END IF
100 CONTINUE
90 CONTINUE
ELSE IF (NUMQII .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 1, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 110
      END IF
120 CONTINUE
110 CONTINUE
ELSE IF (NUMQII .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 1, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 130
      END IF
140 CONTINUE
130 CONTINUE
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
AUX(J,70) = 1
CALL FILEM(10, ATRIB)
CNT100 = CNT100 + 1
CALL SCHDL(28, 7.0, ATRIB)
GO TO 130
END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ1 .EQ. 0) THEN
QUOTA1 = SIZE
DO 150 I = 1, QUOTA1
   CALL RMOVE(1, 11, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 150
      END IF
   160 CONTINUE
   150 CONTINUE
END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
   CANCEL = CANCEL + 1
END IF
END IF
RETURN
ENC

******************************************************************************************************************************************
****
* The following routine is used to schedule training for class*
* SYS100 class 2 of two per year.
*
******************************************************************************************************************************************
****
SUBROUTINE SY100B
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ1, NUMQ11, QUOTA1, QUOTA2

REAL PERCNT
CALL SCHDL(3, 365.0, ATRIB)

SIZE = 45
NUMQ1 = NNQ(1)
NUMQ11 = NNQ(11)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ1 + NUMQ11
IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ11 .GE. TYPE1) .AND. (NUMQ1 .GE. TYPE2)) THEN
        QUOTA1 = TYPE1
        QUOTA2 = TYPE2
        DO 10 I = 1, QUOTA1
            CALL RMOVE(1, 11, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
        DO 20 J = 1, ROWS
            IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(10, ATRIB)
                CNT100 = CNT100 + 1
                CALL SCHDL(28, 7.0, ATRIB)
                GO TO 10
            END IF
        CONTINUE
10 CONTINUE
20 CONTINUE
10 DO 30 I = 1, QUOTA2
    CALL RMOVE(1, 1, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 40 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(10, ATRIB)
            CNT100 = CNT100 + 1
            CALL SCHDL(28, 7.0, ATRIB)
            GO TO 30
        END IF
    END IF
40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ11 .GT. 0) .AND. (NUMQ11 .LT. TYPE1)) THEN
    QUOTA1 = NUMQ11
    QUOTA2 = SIZE - QUOTA1
    DO 50 I = 1, QUOTA1
        CALL RMOVE(1, 11, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
    END DO
50 END DO
DO 60 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(10, ATRIB)
      CNT100 = CNT100 + 1
      CALL SCHDL(28, 7.0, ATRIB)
      GO TO 50
   END IF
60 CONTINUE
50 CONTINUE

DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 1, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 70
      END IF
80 CONTINUE
70 CONTINUE

ELSE IF ((NUMQ1 .GT. 0) .AND. (NUMQ1 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ1
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 11, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(10, ATRIB)
            CNT100 = CNT100 + 1
            CALL SCHDL(28, 7.0, ATRIB)
            GO TO 90
         END IF
100 CONTINUE
90 CONTINUE

   DO 110 I = 1, QUOTA2
      CALL RMOVE(1, 1, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
120 CONTINUE

CNT100 = CNT100 + 1
CALL SCHDL(28, 7.0, ATRIB)
GO TO 110
END IF

120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ11 .EQ. 0) THEN
QUOTA2 = SIZE
DO 130 I = 1,QUOTA2
   CALL RMOVE(I, 1, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 140 J = 1,ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 130
      END IF
   140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ1 .EQ. 0) THEN
QUOTA1 = SIZE
DO 150 I = 1, QUOTA1
   CALL RMOVE(I, 11, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 160 J = 1,ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(10, ATRIB)
         CNT100 = CNT100 + 1
         CALL SCHDL(28, 7.0, ATRIB)
         GO TO 150
      END IF
   160 CONTINUE
150 CONTINUE
ELSE
   CANCEL = CANCEL + 1
END IF
RETURN
END
**Subroutine GRD100 represents the graduation of individuals from the numerous acquisition courses taken for APDP certification. This routine updates their records to reflect the new course and call subroutine ACQLOG for a new evaluated certification.**

***********************************************************

```
SUBROUTINE GRD100
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER NUM
REAL SCHOOL, TODAY, TIME

TODAY = TNOW
SCHOOL = 7
NUM = NNQ(10)
DO 10 I = 1, NUM
   CALL RMOVE(I, 10, ATRIB)
   TIME = TODAY - ATRIB(65)
   IF (TIME .GE. SCHOOL) THEN
      DO 20 J = 1, ROWS
         IF (ATRIB(7) .EQ. AUX(J,7)) THEN
            AUX(J,41) = 100
            ATRIB(41) = 100
            AUX(J,70) = 0
            ATRIB(70) = 0
            AUX(J,51) = 0
            ATRIB(51) = 0
            GO TO 30
         END IF
     20 CONTINUE
   GD100 = GD100 + 1
   IF (ATRIB(52) .EQ. 1) THEN
      IF (ATRIB(62) .EQ. 1) THEN
         CALL FILEM(21, ATRIB)
      ELSE
         CALL FILEM(2, ATRIB)
      END IF
   ELSE
      CALL FILEM(21, ATRIB)
   END IF
   ELSE IF (ATRIB(53) .EQ. 1) THEN
```

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IF (ATRIB(62) .EQ. 1) THEN
   CALL FILEM(31, ATRIB)
ELSE
   CALL FILEM(3, ATRIB)
END IF
ELSE IF (ATRIB(55) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(25, ATRIB)
   ELSE
      CALL FILEM(22, ATRIB)
   END IF
ELSE IF (ATRIB(54) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(41, ATRIB)
   ELSE
      CALL FILEM(4, ATRIB)
   END IF
ELSE IF (ATRIB(56) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(31, ATRIB)
   ELSE
      CALL FILEM(3, ATRIB)
   END IF
ELSE IF (ATRIB(57) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(31, ATRIB)
   ELSE
      CALL FILEM(3, ATRIB)
   END IF
ELSE
   CALL FILEM(10, ATRIB)
END IF

10 CONTINUE
D100 = NUM - NNQ(10)
*   WRITE(19, *) 'DOUBLE CHECK FOR GRADUATE ROUTINE 100'
*   WRITE(19,*) D100,' REMOVED'
   D100 = 0
RETURN
END

***************************************************************************************************************************************
****
* The following routine is used to schedule training for class*
* SYS200 class one of five per year.
* *
***************************************************************************************************************************************
****
SUBROUTINE SY200A
INCLUDE 'usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ2, NUMQ21, QUOTA1, QUOTA2, PERCNT

REAL PERCNT

CALL SCHDL(4, 365.0, ATRIB)

SIZE = 72
NUMQ2 = NNQ(2)
NUMQ21 = NNQ(21)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ2 + NUMQ21
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ21 .GE. TYPE1) .AND. (NUMQ2 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
      CALL RMOVE(I, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 20 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(20, ATRIB)
          CNT200 = CNT200 + 1
          CALL SCHDL(32, 21.0, ATRIB)
          GO TO 10
        END IF
      20 CONTINUE
  10 CONTINUE

    DO 30 I = 1, QUOTA2
      CALL RMOVE(I, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 40 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(20, ATRIB)
          CNT200 = CNT200 + 1
          CALL SCHDL(32, 21.0, ATRIB)
          GO TO 30
        END IF
      40 CONTINUE
  30 CONTINUE
END IF

20 CONTINUE

10 CONTINUE

30 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN

    QUOTA1 = NUMQ21
    QUOTA2 = SIZE - QUOTA1
    DO 50 I = 1, QUOTA1
         CALL RMOVE(I, 21, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 60 J = 1, ROWS
             IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                 CALL FILEM(20, ATRIB)
                 CNT200 = CNT200 + 1
                 CALL SCHDL(32, 21.0, ATRIB)
                 GO TO 50
             END IF
         60 CONTINUE
    50 CONTINUE

    DO 70 I = 1, QUOTA2
         CALL RMOVE(I, 2, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 80 J = 1, ROWS
             IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                 CALL FILEM(20, ATRIB)
                 CNT200 = CNT200 + 1
                 CALL SCHDL(32, 21.0, ATRIB)
                 GO TO 70
             END IF
         80 CONTINUE
    70 CONTINUE
ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN

    QUOTA2 = NUMQ2
    QUOTA1 = SIZE - QUOTA2
    DO 90 I = 1, QUOTA1
         CALL RMOVE(I, 21, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 100 J = 1, ROWS
             IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                 CALL FILEM(20, ATRIB)
                 CNT200 = CNT200 + 1
                 CALL SCHDL(32, 21.0, ATRIB)
                 GO TO 90
             END IF
         100 CONTINUE
    90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 2, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 110
      END IF
   120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ21 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 130
         END IF
      140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ2 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 150
         END IF
      160 CONTINUE
150 CONTINUE
ELSE
   CANCEL = CANCEL + 1
END IF
* The following routine is used to schedule training for class*
* SYS200 class two of five per year.
*
SUBROUTINE SY200B
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ2, NUMQ21, QUOTA1, QUOTA2

REAL PERCNT

CALL SCHDL(5, 365.0, ATRIB)

SIZE = 72
NUMQ2 = NNQ(2)
NUMQ21 = NNQ(21)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ2 + NUMQ21
IF (CHECK .GE. SIZE)
THEN
    IF ((NUMQ21 .GE. TYPE1) .AND. (NUMQ2 .GE. TYPE2))
THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
        CALL RMOVE(I, 21, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
    DO 20 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 10
        END IF
    20 CONTINUE
    10 CONTINUE
    DO 30 I = 1, QUOTA2

EXTERNAL
CALL RMOVE(1, 2, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 40 J = 1, ROWS
   IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(20, ATRIB)
      CNT200 = CNT200 + 1
      CALL SCHDL(32, 21.0, ATRIB)
   GO TO 30
   END IF
40 CONTINUE
30 CONTINUE

ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
         GO TO 50
         END IF
60 CONTINUE
50 CONTINUE

   DO 70 I = 1, QUOTA2
      CALL RMOVE(I, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
         GO TO 70
         END IF
80 CONTINUE
70 CONTINUE

ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ2
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
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CALL RMOVE(1, 21, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 100 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(20, ATRIB)
      CNT200 = CNT200 + 1
      CALL SCHDL(32, 21.0, ATRIB)
   END IF
100 CONTINUE
90 CONTINUE

DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 2, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
      END IF
120 CONTINUE
110 CONTINUE

ELSE IF (NUMQ21 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
         END IF
140 CONTINUE
130 CONTINUE

ELSE IF (NUMQ2 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS

180
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
AUX(J,70) = 1
CALL FILEM(20, ATRIB)
CNT200 = CNT200 + 1
CALL SCHDL(32, 21.0, ATRIB)
GO TO 150
END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
CANCEL = CANCEL + 1
END IF
RETURN
END

*****
* The following routine is used to schedule training for class*  
* SYS200 class three of five per year.  
*  
*****

SUBROUTINE SY200C
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ2, NUMQ21, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(6, 365.0, ATRIB)

SIZE = 72
NUMQ2 = NNQ(2)
NUMQ21 = NNQ(21)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ2 + NUMQ21
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ21 .GE. TYPE1) .AND. (NUMQ2 .GE. TYPE2))
    THEN
      QUOTA1 = TYPE1
      QUOTA2 = TYPE2

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DO 10 I = 1, QUOTA1
   CALL RMOVE(1, 21, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 20 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 10
      END IF
   20 CONTINUE
10 CONTINUE
DO 30 I = 1, QUOTA2
   CALL RMOVE(1, 2, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 30
      END IF
   40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
50 CONTINUE

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DO 80 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(20, ATRIB)
      CNT200 = CNT200 + 1
      CALL SCHDL(32, 21.0, ATRIB)
      GO TO 70
   END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ2
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 90
      END IF
   100 CONTINUE
   DO 110 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 110
      END IF
   120 CONTINUE
   END IF
90 CONTINUE
ELSE IF (NUMQ21 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 130
      END IF
   140 CONTINUE
   END IF
110 CONTINUE
130 CONTINUE
ELSE IF (NUMQ21 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
   DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(20, ATRIB)
         CNT200 = CNT200 + 1
         CALL SCHDL(32, 21.0, ATRIB)
         GO TO 130
      END IF
   140 CONTINUE
   END IF
130 CONTINUE
140 CONTINUE
AUX(J,70) = 1
CALL FILEM(20, ATRIB)
CNT200 = CNT200 + 1
CALL SCHDL(32, 21.0, ATRIB)
GO TO 130

END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ2 .EQ. 0) THEN
QUOTA1 = SIZE
DO 150 I = 1, QUOTA1
CALL RMOVE(1, 21, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 160 J = 1, ROWS
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
AUX(J,70) = 1
CALL FILEM(20, ATRIB)
CNT200 = CNT200 + 1
CALL SCHDL(32, 21.0, ATRIB)
GO TO 150
END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
CANCEL = CANCEL + 1
END IF
RETURN
END

SUBROUTINE SY200D
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ2, NUMQ21, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(7, 365.0, ATRIB)
SIZE = 72
NUMQ2 = NNQ(2)
NUMQ21 = NNQ(21)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ2 + NUMQ21
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ21 .GE. TYPE1) .AND. (NUMQ2 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
       CALL RMOVE(1, 21, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
       DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 10
          END IF
  ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
    QUOTA1 = NUMQ21
    QUOTA2 = SIZE - QUOTA1
    DO 50 I = 1, QUOTA1
       CALL RMOVE(1, 21, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
       DO 60 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 30
          END IF
  ELSE
    END IF
  END IF
END IF
IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
    AUX(J, 70) = 1
    CALL FILEM(20, ATRIB)
    CNT200 = CNT200 + 1
    CALL SCHDL(32, 21.0, ATRIB)
    GO TO 50
END IF

60 CONTINUE
50 CONTINUE

DO 70 I = 1, QUOTA2
    CALL RMOVE(I, 2, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 80 J = 1, ROWS
        IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
            AUX(J, 70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 70
        END IF
    80 CONTINUE
70 CONTINUE

ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN

    QUOTA2 = NUMQ2
    QUOTA1 = SIZE - QUOTA2
    DO 90 I = 1, QUOTA1
        CALL RMOVE(I, 21, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 100 J = 1, ROWS
            IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
                AUX(J, 70) = 1
                CALL FILEM(20, ATRIB)
                CNT200 = CNT200 + 1
                CALL SCHDL(32, 21.0, ATRIB)
                GO TO 90
            END IF
        100 CONTINUE
90 CONTINUE

    ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN

        QUOTA2 = NUMQ2
        QUOTA1 = SIZE - QUOTA2
        DO 110 I = 1, QUOTA2
            CALL RMOVE(I, 2, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
            DO 120 J = 1, ROWS
                IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
                    AUX(J, 70) = 1
                    CALL FILEM(20, ATRIB)
                    CNT200 = CNT200 + 1
                    GO TO 110
                END IF
            120 CONTINUE
110 CONTINUE

END IF

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CALL SCHDL(32, 21.0, ATRIB)
GO TO 110
END IF
120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ21 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 130
         END IF
      140 CONTINUE
   130 CONTINUE
ELSE IF (NUMQ2 .EQ. 0) THEN
   QUOTAl = SIZE
   DO 150 I = 1, QUOTAl
      CALL RMOVE(I, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 150
         END IF
      160 CONTINUE
   150 CONTINUE
END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ2 .EQ. 0) THEN
   QUOTAl = SIZE
   DO 150 I = 1, QUOTAl
      CALL RMOVE(I, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHDL(32, 21.0, ATRIB)
            GO TO 150
         END IF
      160 CONTINUE
   150 CONTINUE
ELSE
   CANCEL = CANCEL + 1
END IF
RETURN
END

******************************************************************************
****
* The following routine is used to schedule training for class*

187
* SYS200 class five of five per year.
*

******************************************************************************
****

SUBROUTINE SY200E
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ2, NUMQ21, QUOTA1, QUOTA2

REAL PERCNT

CALL SCHDL(8, 365.0, ATRIB)

SIZE = 72
NUMQ2 = NNQ(2)
NUMQ21 = NNQ(21)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ2 + NUMQ21
IF (CHECK .GE. SIZE) THEN
   IF ((NUMQ21 .GE. TYPE1) .AND. (NUMQ2 .GE. TYPE2)) THEN
      QUOTA1 = TYPE1
      QUOTA2 = TYPE2
      DO 10 I = 1, QUOTA1
         CALL RMOVE(1, 21, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 20 J = 1, ROWS
            IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
               AUX(J,70) = 1
               CALL FILEM(20, ATRIB)
               CNT200 = CNT200 + 1
               CALL SCHDL(32, 21.0, ATRIB)
            END IF
         20 CONTINUE
      10 CONTINUE
   END IF

   DO 30 I = 1, QUOTA2
      CALL RMOVE(1, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 40 J = 1, ROWS
         IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
         END IF
      40 CONTINUE
   30 CONTINUE

END IF
CALL SCHEDL(32, 21.0, ATRIB)
GO TO 30
END IF
40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ21 .GT. 0) .AND. (NUMQ21 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ21
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(I, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHEDL(32, 21.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
   50 CONTINUE
   DO 70 I = 1,QUOTA2
      CALL RMOVE(I, 2, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
            CALL SCHEDL(32, 21.0, ATRIB)
            GO TO 70
         END IF
      80 CONTINUE
   70 CONTINUE
ELSE IF ((NUMQ2 .GT. 0) .AND. (NUMQ2 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ2
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(I, 21, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(20, ATRIB)
            CNT200 = CNT200 + 1
         END IF
      100 CONTINUE
   END IF
CALL SCHDL(32, 21.0, ATRIB)
GO TO 90
END IF
100
CONTINUE
90
CONTINUE
DO 110 I = 1, QUOTA2
CALL RMOVE(I, 2, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 120 J = 1, ROWS
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
  AUX(J,70) = 1
  CALL FILEM(20, ATRIB)
  CNT200 = CNT200 + 1
  CALL SCHDL(32, 21.0, ATRIB)
  GO TO 110
END IF
120
CONTINUE
110
CONTINUE
ELSE IF (NUMQ21 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1, QUOTA2
  CALL RMOVE(I, 2, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 140 J = 1, ROWS
  IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(20, ATRIB)
    CNT200 = CNT200 + 1
    CALL SCHDL(32, 21.0, ATRIB)
    GO TO 130
  END IF
140
CONTINUE
130
CONTINUE
ELSE IF (NUMQ2 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
  CALL RMOVE(I, 21, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 160 J = 1, ROWS
  IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(20, ATRIB)
    CNT200 = CNT200 + 1
    CALL SCHDL(32, 21.0, ATRIB)
    GO TO 150
  END IF
160
CONTINUE
150
CONTINUE
CONTINUE
END IF
ELSE
    CANCEL = CANCEL + 1
END IF
RETURN
END

Subroutine GRD200 represents the graduation of individuals
from the numerous acquisition courses taken for APDP certification. This routine updates their records to
reflect the new course and call subroutine ACQLOG for a new
evaluated certification.

SUBROUTINE GRD200
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

REAL NUM, SCHOOL, TODAY, TIME

TODAY = TNOW
SCHOOL = 21
NUM = NNQ(20)
DO 10 I = 1, NUM
    CALL RMOVE(1, 20, ATRIB)
    TIME = TODAY - ATRIB(65)
    IF (TIME .GE. SCHOOL) THEN
        DO 20 J = 1, ROWS
            IF (ATRIB(7) .EQ. AUX(J,7)) THEN
                AUX(J,42) = 102
                ATRIB(42) = 102
                AUX(J,70) = 0
                ATRIB(70) = 0
                AUX(J,52) = 0
                ATRIB(52) = 0
                GO TO 30
            END IF
        20 CONTINUE
        GD200 = GD200 + 1
        IF (ATRIB(53) .EQ. 1) THEN
            191
IF (ATRIB(62) .EQ. 1) THEN
   CALL FILEM(31, ATRIB)
ELSE
   CALL FILEM(3, ATRIB)
END IF
ELSE IF (ATRIB(55) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(25, ATRIB)
   ELSE
      CALL FILEM(22, ATRIB)
   END IF
ELSE IF (ATRIB(54) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(41, ATRIB)
   ELSE
      CALL FILEM(4, ATRIB)
   END IF
ELSE IF (ATRIB(56) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(31, ATRIB)
   ELSE
      CALL FILEM(3, ATRIB)
   END IF
ELSE IF (ATRIB(57) .EQ. 1) THEN
   IF (ATRIB(62) .EQ. 1) THEN
      CALL FILEM(31, ATRIB)
   ELSE
      CALL FILEM(3, ATRIB)
   END IF
ELSE
   CALL FILEM(20, ATRIB)
END IF
END IF
10 CONTINUE
D200 = NUM - NNQ(20)
* WRITE(19, *) 'DOUBLE CHECK FOR GRADUATE ROUTINE 200'
* WRITE(19,*) D200,' REMOVED'
D200 = 0
RETURN
END

******************************************************************************
****
* The following routine is used to schedule training for class*
* SYS225 class one of six per year.
* *
******************************************************************************
****
SUBROUTINE SY225A
INCLUDE '/usr/local/Slam/Param.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(9, 365.0, ATRIB)

SIZE = 45
NUMQ22 = NNQ(22)
NUMQ25 = NNQ(25)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ22 + NUMQ25
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 20 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(12, ATRIB)
          CALL SCHDL(33, 14.0, ATRIB)
          GO TO 10
        END IF
      20 CONTINUE
  10 CONTINUE
  ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN
    193
QUOTA1 = NUMQ25
QUOTA2 = SIZE - QUOTA1
DO 50 I = 1, QUOTA1
   CALL RMOVE(1, 25, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 50
      END IF
   60 CONTINUE
50 CONTINUE
DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 70
      END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ22
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 90
         END IF
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 110
      END IF
120 CONTINUE
110 CONTINUE
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(12, ATRIB)
    CALL SCHDL(33, 14.0, ATRIB)
    GO TO 110
END IF

120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ25 .EQ. 0) THEN
    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2
        CALL RMOVE(I, 22, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 140 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 130
            END IF
        140 CONTINUE
    130 CONTINUE
ELSE IF (NUMQ22 .EQ. 0) THEN
    QUOTA1 = SIZE
    DO 150 I = 1, QUOTA1
        CALL RMOVE(I, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 160 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 150
            END IF
        160 CONTINUE
    150 CONTINUE
ELSE
    CANCEL = CANCEL + 1
END IF
END IF
RETURN
END
The following routine is used to schedule training for class SYS225 class two of six per year.

```
SUBROUTINE SY225B
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(10, 365.0, ATRIB)

SIZE = 45
NUMQ22 = NNQ(22)
NUMQ25 = NNQ(25)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ22 + NUMQ25
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
       CALL RMOVE(I, 25, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
    DO 20 J = 1, ROWS
       IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(12, ATRIB)
          CALL SCHDL(33, 14.0, ATRIB)
          GO TO 10
       END IF
    CONTINUE
 10 CONTINUE
  DO 30 I = 1, QUOTA2
     CALL RMOVE(I, 22, ATRIB)
     ATRIB(70) = 1
     ATRIB(65) = TNOW
  DO 40 J = 1, ROWS
     IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
        END IF
  CONTINUE
30 CONTINUE
```

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AUX(J,70) = 1
CALL FILEM(12, ATRIB)
CALL SCHDL(33, 14.0, ATRIB)
GO TO 30
END IF

40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN

QUOTA1 = NUMQ25
QUOTA2 = SIZE - QUOTA1
DO 50 I = 1, QUOTA1
   CALL RMOVE(1, 25, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 50
      END IF
   60 CONTINUE
50 CONTINUE

DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 70
      END IF
   80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN

QUOTA2 = NUMQ22
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
   CALL RMOVE(1, 25, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
      END IF
   100 CONTINUE
90 CONTINUE

GO TO 90
END IF
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 110
      END IF
   120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ25 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 22, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 130
         END IF
      140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ22 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 150
         END IF
      160 CONTINUE
150 CONTINUE
END IF
ELSE
   CANCEL = CANCEL + 1

END IF
198
The following routine is used to schedule training for class SYS225 class three of six per year.

**SUBROUTINE SY22SC**

**INCLUDE */usr/local/Slam/PARAM.INC'*

**INCLUDE 'USER.ONE'**

**INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2**

**REAL PERCNT**

**CALL SCHDL(11, 365.0, ATRIB)**

**SIZE = 45**

**NUMQ22 = NNQ(22)**

**NUMQ25 = NNQ(25)**

**PERCNT = 0.70**

**TYPE1 = NINT(PERCNT*SIZE)**

**TYPE2 = SIZE - TYPE1**

**CHECK = NUMQ22 + NUMQ25**

**IF (CHECK .GE. SIZE) THEN**

**IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2)) THEN**

**QUOTA1 = TYPE1**

**QUOTA2 = TYPE2**

**DO 10 I = 1, QUOTA1**

**CALL RMOVE(1, 25, ATRIB)**

**ATRIB(70) = 1**

**ATRIB(65) = TNOW**

**DO 20 J = 1, ROWS**

**IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN**

**AUX(J,70) = 1**

**CALL FILEM(12, ATRIB)**

**CALL SCHDL(33, 14.0, ATRIB)**

**GO TO 10**

**END IF**

20 **CONTINUE**

10 **CONTINUE**
DO 30 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHEDL(33, 14.0, ATRIB)
         GO TO 30
      END IF
   40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ25
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHEDL(33, 14.0, ATRIB)
            GO TO 50
         END IF
   60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ22
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHEDL(33, 14.0, ATRIB)
            GO TO 70
         END IF
   80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ25
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHEDL(33, 14.0, ATRIB)
            GO TO 50
         END IF
   60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ22
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHEDL(33, 14.0, ATRIB)
            GO TO 70
         END IF
   80 CONTINUE
70 CONTINUE
END IF
200
ATRIB(65) = TNOW
DO 100 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(12, ATRIB)
        CALL SCHDL(33, 14.0, ATRIB)
        GO TO 90
    END IF
100 CONTINUE
90 CONTINUE

DO 110 I = 1, QUOTA2
    CALL RMOVE(I, 22, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
DO 120 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(12, ATRIB)
        CALL SCHDL(33, 14.0, ATRIB)
        GO TO 110
    END IF
120 CONTINUE
110 CONTINUE

ELSE IF (NUMQ25 .EQ. 0) THEN
    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2
        CALL RMOVE(I, 22, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 140 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 130
            END IF
        140 CONTINUE
    130 CONTINUE

ELSE IF (NUMQ22 .EQ. 0) THEN
    QUOTA1 = SIZE
    DO 150 I = 1, QUOTA1
        CALL RMOVE(I, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 160 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 150
            END IF
        160 CONTINUE
    150 CONTINUE

The following routine is used to schedule training for class* SYS225 class four of six per year.

SUBROUTINE SY225D
  INCLUDE '/usr/local/Slam/PARAM.INC'
  INCLUDE 'USER.ONE'

  INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2
  REAL PERCNT

  CALL SCHDL(12, 365.0, ATRIB)

  SIZE = 45
  NUMQ22 = NNQ(22)
  NUMQ25 = NNQ(25)
  PERCNT = 0.70
  TYPE1 = NINT(PERCNT*SIZE)
  TYPE2 = SIZE - TYPE1
  CHECK = NUMQ22 + NUMQ25
  IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2)) THEN
      QUOTA1 = TYPE1
      QUOTA2 = TYPE2
      DO 10 I = 1, QUOTA1
        CALL RMOVE(I, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
      DO 20 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
        ELSE
          CANCEL = CANCEL + 1
        END IF
      END DO
      RETURN
    END IF
  ELSE
    CANCEL = CANCEL + 1
  END IF
END

************************************************
****
* The following routine is used to schedule training for class* SYS225 class four of six per year.
* ************************************************
CALL FILEM(12, ATRIB)
CALL SCHDL(33, 14.0, ATRIB)
GO TO 10
END IF
20 CONTINUE
10 CONTINUE
DO 30 I = 1, QUOTA2
   CALL RMOVE(1, 22, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J, 7)) .EQ. ATRIB(7)) THEN
         AUX(J, 70) = 1
         CALL FILEM(12, ATRIB)
         CALL SCHDL(33, 14.0, ATRIB)
         GO TO 30
      END IF
40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ25
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
            AUX(J, 70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 50
         END IF
60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ25
   QUOTA2 = SIZE - QUOTA1
   DO 70 I = 1, QUOTA2
      CALL RMOVE(1, 22, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J, 7)) .EQ. ATRIB(7)) THEN
            AUX(J, 70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 70
         END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
    QUOTA2 = NUMQ22
    QUOTAl = SIZE - QUOTA2
    DO 90 I = 1, QUOTAl
        CALL RMOVE(1, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 100 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 90
            END IF
        100 CONTINUE
    90 CONTINUE
    DO 110 I = 1, QUOTA2
        CALL RMOVE(I, 22, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 120 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 110
            END IF
        120 CONTINUE
    110 CONTINUE
ELSE IF (NUMQ25 .EQ. 0) THEN
    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2
        CALL RMOVE(1, 22, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 140 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 130
            END IF
        140 CONTINUE
    130 CONTINUE
ELSE IF (NUMQ22 .EQ. 0) THEN
    QUOTAl = SIZE
    DO 150 I = 1, QUOTAl
        CALL RMOVE(1, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 160 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(12, ATRIB)
                CALL SCHDL(33, 14.0, ATRIB)
                GO TO 150
            END IF
        160 CONTINUE
    150 CONTINUE
204
ATRIB(65) = TNOW
DO 160 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
      GO TO 150
   END IF
160   CONTINUE
150   CONTINUE
END IF
ELSE
   CANCEL = CANCEL + 1
END IF
RETURN
END

************************************************************
****
* The following routine is used to schedule training for class*
* SYS225 class five of six per year.  *
* ************************************************************
****
SUBROUTINE SY225E
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(13, 365.0, ATRIB)

SIZE = 45
NUMQ22 = NNQ(22)
NUMQ25 = NNQ(25)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ22 + NUMQ25
IF (CHECK .GE. SIZE) THEN
   IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2))
      THEN
         QUOTA1 = TYPE1
         QUOTA2 = TYPE2
         DO 10 I = 1, QUOTA1
            10       }
205
CALL RMOVE(1, 25, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 20 J = 1, ROWS
  IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(12, ATRIB)
    CALL SCHDL(33, 14.0, ATRIB)
    GO TO 10
  END IF
20 CONTINUE
10 CONTINUE

DO 30 I = 1, QUOTA2
  CALL RMOVE(1, 22, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 40 J = 1, ROWS
    IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
      GO TO 30
    END IF
40 CONTINUE
30 CONTINUE

ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN

  QUOTA1 = NUMQ25
  QUOTA2 = SIZE - QUOTA1
  DO 50 I = 1, QUOTA1
    CALL RMOVE(1, 25, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(12, ATRIB)
        CALL SCHDL(33, 14.0, ATRIB)
        GO TO 50
      END IF
60 CONTINUE
50 CONTINUE

ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1)) THEN

  QUOTA1 = NUMQ25
  QUOTA2 = SIZE - QUOTA1
  DO 50 I = 1, QUOTA1
    CALL RMOVE(1, 25, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(12, ATRIB)
        CALL SCHDL(33, 14.0, ATRIB)
        GO TO 50
      END IF
60 CONTINUE
50 CONTINUE

DO 70 I = 1, QUOTA2
  CALL RMOVE(1, 22, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 80 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
206
CALL SCHDL(33, 14.0, ATRIB)
GO TO 70
END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
QUOTA2 = NUMQ22
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
  CALL RMOVE(I, 25, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 100 J = 1, ROWS
    IF (((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
      GO TO 90
    END IF
  100 CONTINUE
90 CONTINUE
ELSE IF (NUMQ25 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1, QUOTA2
    CALL RMOVE(I, 22, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
      IF (((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(12, ATRIB)
        CALL SCHDL(33, 14.0, ATRIB)
        GO TO 130
      END IF
    140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ22 .EQ. 0) THEN
    QUOTA1 = SIZE
    DO 150 I = 1, QUOTA1
        CALL RMOVE(1, 25, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
        IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(12, ATRIB)
            CALL SCHDL(33, 14.0, ATRIB)
            GO TO 150
        END IF
    160 CONTINUE
    150 CONTINUE
END IF
ELSE
    CANCEL = CANCEL + 1
END IF
RETURN
END

*************************************************************
***
* The following routine is used to schedule training for class *
* SYS225 class six of six per year. *
*
*************************************************************
***

SUBROUTINE SY225F
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ22, NUMQ25, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(14, 365.0, ATRIB)

SIZE = 45
NUMQ22 = NNQ(22)
NUMQ25 = NNQ(25)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ22 + NUMQ25
IF (CHECK .GE. SIZE) THEN
IF ((NUMQ25 .GE. TYPE1) .AND. (NUMQ22 .GE. TYPE2))
THEN
  QUOTA1 = TYPE1
  QUOTA2 = TYPE2
  DO 10 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
              AUX(J,70) = 1
              CALL FILEM(12, ATRIB)
              CALL SCHDL(33, 14.0, ATRIB)
              GO TO 10
          END IF
  20 CONTINUE
10 CONTINUE
  DO 30 I = 1, QUOTA2
      CALL RMOVE(1, 22, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 40 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
              AUX(J,70) = 1
              CALL FILEM(12, ATRIB)
              CALL SCHDL(33, 14.0, ATRIB)
              GO TO 30
          END IF
  40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ25 .GT. 0) .AND. (NUMQ25 .LT. TYPE1))
THEN
  QUOTA1 = NUMQ25
  QUOTA2 = SIZE - QUOTA1
  DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 25, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
          IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
              AUX(J,70) = 1
              CALL FILEM(12, ATRIB)
              CALL SCHDL(33, 14.0, ATRIB)
              GO TO 50
          END IF
  60 CONTINUE
50 CONTINUE
  DO 70 I = 1, QUOTA2
      CALL RMOVE(1, 22, ATRIB)
      ATRIB(70) = 1
ATRIB(65) = TNOW
DO 80 J = 1, ROWS
  IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(12, ATRIB)
    CALL SCHDL(33, 14.0, ATRIB)
  GO TO 70
END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ22 .GT. 0) .AND. (NUMQ22 .LT. TYPE2)) THEN
QUOTA2 = NUMQ22
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
  CALL RMOVE(1, 25, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 100 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
    GO TO 90
  END IF
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
  CALL RMOVE(1, 22, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 120 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
      CALL SCHDL(33, 14.0, ATRIB)
    GO TO 110
  END IF
120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ25 .EQ. 0) THEN
QUOTA2 = SIZE
DO 130 I = 1, QUOTA2
  CALL RMOVE(1, 22, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 140 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(12, ATRIB)
    GO TO 130
  END IF
140 CONTINUE
130 CONTINUE
CALL SCHDL(33, 14.0, ATRIB)
GO TO 130
END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ22 .EQ. 0) THEN
QUOTAl = SIZE
DO 150 I = 1, QUOTAl
CALL RMOVE(1, 25, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 160 J = 1, ROWS
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
AUX(J,70) = 1
CALL FILEM(12, ATRIB)
CALL SCHDL(33, 14.0, ATRIB)
GO TO 150
END IF
150 CONTINUE
160 CONTINUE
END IF
ELSE
CANCEL = CANCEL + 1
END IF
RETURN
END

***************************
** Subroutine GRD225 represents the graduation of individuals**
** from the numerous acquisition courses taken for APDP certification. This routine updates their records to**
** reflect the new course and call subroutine ACQLOG for a new**
** evaluated certification.**
***************************

SUBROUTINE GRD225
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

REAL NUM, SCHOOL, TODAY, TIME
TODAY = TNOW
SCHOOL = 14
NUM = NNQ(12)
DO 10 I = 1, NUM
    CALL RMOVE(1, 12, ATRIB)
    TIME = TODAY - ATRIB(65)
    IF (TIME .GE. SCHOOL) THEN
        DO 20 J = 1, ROWS
            IF (ATRIB(7) .EQ. AUX(J,7)) THEN
                AUX(J,45) = 104
                ATRIB(45) = 104
                AUX(J,70) = 0
                ATRIB(70) = 0
                AUX(J,55) = 0
                ATRIB(55) = 0
                GO TO 30
            END IF
        20 CONTINUE
        GD225 = GD225 + 1
        IF (ATRIB(54) .EQ. 1) THEN
            IF (ATRIB(62) .EQ. 1) THEN
                CALL FILEM(41, ATRIB)
            ELSE
                CALL FILEM(4, ATRIB)
            END IF
        ELSE IF (ATRIB(56) .EQ. 1) THEN
            IF (ATRIB(62) .EQ. 1) THEN
                CALL FILEM(31, ATRIB)
            ELSE
                CALL FILEM(3, ATRIB)
            END IF
        ELSE IF (ATRIB(57) .EQ. 1) THEN
            IF (ATRIB(62) .EQ. 1) THEN
                CALL FILEM(31, ATRIB)
            ELSE
                CALL FILEM(3, ATRIB)
            END IF
        ELSE
            CALL FILEM(12, ATRIB)
        END IF
    ELSE IF (ATRIB(56) .EQ. 1) THEN
        IF (ATRIB(62) .EQ. 1) THEN
            CALL FILEM(31, ATRIB)
        ELSE
            CALL FILEM(3, ATRIB)
        END IF
    ELSE IF (ATRIB(57) .EQ. 1) THEN
        IF (ATRIB(62) .EQ. 1) THEN
            CALL FILEM(31, ATRIB)
        ELSE
            CALL FILEM(3, ATRIB)
        END IF
    ELSE
        CALL FILEM(12, ATRIB)
    END IF
10 CONTINUE
RETURN
END

************************************************************************************************************************************
****
* The following routine is used to schedule training for class*

212
SUBROUTINE SY400A
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(15, 365.0, ATRIB)

SIZE = 45
NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70

TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
       CALL RMOVE(1, 41, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
       DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
             AUX(J,70) = 1
             CALL FILEM(40, ATRIB)
             CALL SCHDL(34, 14.0, ATRIB)
             GO TO 10
          END IF
       20 CONTINUE
    10 CONTINUE
  END IF
END IF
213
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN

QUOTA1 = NUMQ41
QUOTA2 = SIZE - QUOTA1
DO 50 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      GO TO 50
   END IF
60 CONTINUE
50 CONTINUE

DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      GO TO 70
   END IF
80 CONTINUE
70 CONTINUE

ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN

QUOTA2 = NUMQ4
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      GO TO 90
   END IF
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
       IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
           AUX(J,70) = 1
           CALL FILEM(40, ATRIB)
           CALL SCHDL(34, 14.0, ATRIB)
           GO TO 110
       END IF
   120 CONTINUE
   110 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
          IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
              AUX(J,70) = 1
              CALL FILEM(40, ATRIB)
              CALL SCHDL(34, 14.0, ATRIB)
              GO TO 130
          END IF
      140 CONTINUE
   130 CONTINUE
ELSE IF (NUMQ4 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
          IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
              AUX(J,70) = 1
              CALL FILEM(40, ATRIB)
              CALL SCHDL(34, 14.0, ATRIB)
              GO TO 150
          END IF
      160 CONTINUE
   150 CONTINUE
ELSE
   CANCEL = CANCEL + 1
END IF
END
* The following routine is used to schedule training for class*
* SY£400 class two of nine per year.
*
* SUBROUTINE SY400B
  INCLUDE '/usr/local/Slam/PARAM.INC'
  INCLUDE 'USER.ONE'

  INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
  REAL PERCNT

  CALL SCHDL(16, 365.0, ATRIB)

  SIZE = 45
  NUMQ4 = NNQ(4)
  NUMQ41 = NNQ(41)
  PERCNT = 0.70
  TYPE1 = NINT(PERCNT*SIZE)
  TYPE2 = SIZE - TYPE1
  CHECK = NUMQ4 + NUMQ41
  IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
      QUOTA1 = TYPE1
      QUOTA2 = TYPE2
      DO 10 I = 1, QUOTA1
        CALL RMOVE(I, 41, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
          END IF
        20 CONTINUE
      10 CONTINUE
    ELSE
      QUOTA1 = TYPE1
      QUOTA2 = TYPE2
      DO 30 I = 1, QUOTA2
        CALL RMOVE(I, 4, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 40 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
          END IF
        40 CONTINUE
      30 CONTINUE
    END IF
  ELSE
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
      CALL RMOVE(I, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 20 J = 1, ROWS
        IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(40, ATRIB)
          CALL SCHDL(34, 14.0, ATRIB)
        END IF
      20 CONTINUE
    10 CONTINUE
  END IF

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AUX(J,70) = 1
CALL FILEM(40, ATRIB)
CALL SCHDL(34, 14.0, ATRIB)
GO TO 30
END IF

40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
QUOTA1 = NUMQ41
QUOTA2 = SIZE - QUOTA1
DO 50 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 50
      END IF
   60 CONTINUE
50 CONTINUE
else if ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 90
         END IF
      100 CONTINUE
90 CONTINUE
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 90
         END IF
      100 CONTINUE
90 CONTINUE
GO TO 90
END IF
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 110
      END IF
   120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN
   QUOTA2 = SIZE
   DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 130
         END IF
      140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ4 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 150
         END IF
      160 CONTINUE
150 CONTINUE
END IF
ELSE
   CANCEL = CANCEL + 1
SUBROUTINE SY400C
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(17, 365.0, ATRIB)

SIZE = 45

NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
      CALL RMOVE(I, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
    DO 20 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
      GO TO 20
    END IF
  10 CONTINUE
  20 CONTINUE
  END IF
  GO TO 10
END IF
RETURN
END
DO 30 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 30
      END IF
   40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ41
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
   50 CONTINUE
END IF
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 70 I = 1, QUOTA2
      CALL RMOVE(1, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 70
         END IF
      80 CONTINUE
   70 CONTINUE
END IF
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 90
         END IF
      100 CONTINUE
   90 CONTINUE
END IF
ATRIB(65) = TNOW
DO 100 J = 1, ROWS
  IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(40, ATRIB)
    CALL SCHDL(34, 14.0, ATRIB)
    GO TO 90
  END IF
100 CONTINUE
90 CONTINUE

DO 110 I = 1, QUOTA2
  CALL RMOVE(1, 4, ATRIB)
  ATRIB(70) = 1
  ATRIB(65) = TNOW
  DO 120 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(40, ATRIB)
      CALL SCHDL(34, 14.0, ATRIB)
      GO TO 110
    END IF
120 CONTINUE
110 CONTINUE

ELSE IF (NUMQ41 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 130
      END IF
140 CONTINUE
130 CONTINUE

ELSE IF (NUMQ4 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 150
      END IF
160 CONTINUE
150 CONTINUE

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END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
CANCEL = CANCEL + 1
END IF
RETURN
END

*****************************************************************************
 ****  The following routine is used to schedule training for class
 ****  SYS400 class four of nine per year.
 ****
*****************************************************************************

SUBROUTINE SY400D
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'
INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT
CALL SCHDL(18, 365.0, ATRIB)

SIZE = 45
NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2))
THEN
  QUOTA1 = TYPE1
  QUOTA2 = TYPE2
  DO I = 1, QUOTA1
    CALL RMOVE(I, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
      END IF
    END DO
  END DO
END IF
END THEN
CALL FILEM(40, ATRIB)
CALL SCHDL(34, 14.0, ATRIB)
GO TO 10

END IF
20 CONTINUE
10 CONTINUE
DO 30 I = 1, QUOTA2
   CALL RMOVE(I, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 30
      END IF
   40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ41
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(I, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 50
         END IF
      60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ41
   QUOTA2 = SIZE - QUOTA1
   DO 70 I = 1, QUOTA2
      CALL RMOVE(I, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 80 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 70
         END IF
      80 CONTINUE
70 CONTINUE

END IF
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN

QUOTA2 = NUMQ4
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
   CALL RMOVE(I, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      END IF
   100 CONTINUE
90 CONTINUE

DO 110 I = 1, QUOTA2
   CALL RMOVE(I, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      GO TO 110
   120 CONTINUE
110 CONTINUE

ELSE IF (NUMQ41 .EQ. 0) THEN
QUOTA2 = SIZE
DO 130 I = 1, QUOTA2
   CALL RMOVE(I, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
      GO TO 130
   140 CONTINUE
130 CONTINUE

ELSE IF (NUMQ4 .EQ. 0) THEN
QUOTA1 = SIZE
DO 150 I = 1, QUOTA1
   CALL RMOVE(I, 41, ATRIB)
   ATRIB(70) = 1
150 CONTINUE

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ATTRIB(65) = TNOW
DO 160 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(40, ATRIB)
      CALL SCHDL(34, 14.0, ATRIB)
   GO TO 150
   END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
   CANCEL = CANCEL + 1
END IF
RETURN
END

* The following routine is used to schedule training for class *
* SYS400 class five of nine per year. *

SUBROUTINE SY400E
   INCLUDE '/usr/local/Slam/PARAM.INC'
   INCLUDE 'USER.ONE'

   INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
   REAL PERCNT

   CALL SCHDL(19, 365.0, ATRIB)

   SIZE = 45
   NUMQ4 = NNQ(4)
   NUMQ41 = NNQ(41)
   PERCNT = 0.70
   TYPE1 = NINT(PERCNT*SIZE)
   TYPE2 = SIZE - TYPE1
   CHECK = NUMQ4 + NUMQ41
   IF (CHECK .GE. SIZE) THEN
      IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
         QUOTA1 = TYPE1
         QUOTA2 = TYPE2
      END IF
   END IF
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DO 10 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 20 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 10
      END IF
   20 CONTINUE
10 CONTINUE

DO 30 I = 1,QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 30
      END IF
   40 CONTINUE
30 CONTINUE

ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1))
   THEN
      QUOTA1 = NUMQ41
      QUOTA2 = SIZE - QUOTA1
      DO 50 I = 1, QUOTA1
         CALL RMOVE(1, 41, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 60 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
               AUX(J,70) = 1
               CALL FILEM(40, ATRIB)
               CALL SCHDL(34, 14.0, ATRIB)
               GO TO 50
            END IF
         60 CONTINUE
50 CONTINUE

ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1))
   THEN
      QUOTA1 = NUMQ41
      QUOTA2 = SIZE - QUOTA1
      DO 50 I = 1, QUOTA1
         CALL RMOVE(1, 41, ATRIB)
         ATRIB(70) = 1
         ATRIB(65) = TNOW
         DO 60 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
               AUX(J,70) = 1
               CALL FILEM(40, ATRIB)
               CALL SCHDL(34, 14.0, ATRIB)
               GO TO 50
            END IF
         60 CONTINUE
50 CONTINUE

DO 70 I = 1,QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
      END IF
80 CONTINUE
70 CONTINUE

226
CALL FILEM(40, ATRIB)
CALL SCHDL(34, 14.0, ATRIB)
GO TO 70
END IF

80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN

QUOTA2 = NUMQ4
QUOTA1 = SIZE - QUOTA2
DO 90 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 90
      END IF
   100 CONTINUE
90 CONTINUE

DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 110
      END IF
   120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN

QUOTA2 = SIZE
DO 130 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 130
      END IF
   140 CONTINUE
130 CONTINUE
CONTINUE
ELSE IF (NUMQ4 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
    CALL RMOVE(1, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 150
      END IF
  END DO
160 CONTINUE
150 CONTINUE
END IF
ELSE
  CANCEL = CANCEL + 1
END IF
RETURN
END

*************** **** **** *** *** * ******** **************
*
The following routine is used to schedule training for class*
* SYS400 class six of nine per year.
*
*************** **** **** *** *** * ******** **************

SUBROUTINE SY400F
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2

REAL PERCNT

CALL SCHDL(20, 365.0, ATRIB)

SIZE = 45
NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
        CALL RMOVE(1, 41, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 10
          END IF
        20 CONTINUE
    10 CONTINUE
    DO 30 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
      GO TO 30
      END IF
    40 CONTINUE
  30 CONTINUE
ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
  QUOTA1 = NUMQ41
  QUOTA2 = SIZE - QUOTA1
  DO 50 I = 1, QUOTA1
    CALL RMOVE(1, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 50
      END IF
    60 CONTINUE
  50 CONTINUE
  DO 70 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
  70 CONTINUE

ATRIB(70) = 1
ATRIB(65) = TNOW
DO 80 J = 1, ROWS
  IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
    AUX(J,70) = 1
    CALL FILEM(40, ATRIB)
    CALL SCHDL(34, 14.0, ATRIB)
    GO TO 70
  END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
  QUOTA2 = NUMQ4
  QUOTA1 = SIZE - QUOTA2
  DO 90 I = 1, QUOTA1
    CALL RMOVE(1, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 100 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 90
      END IF
    100 CONTINUE
  90 CONTINUE
  ELSE IF (NUMQ41 .EQ. 0) THEN
    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2
      CALL RMOVE(1, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 140 J = 1, ROWS
        IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(40, ATRIB)
          CALL SCHDL(34, 14.0, ATRIB)
          GO TO 110
        END IF
      140 CONTINUE
  110 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
      140 CONTINUE

230
CALL FILEM(40, ATRIB)
CALL SCHDL(34, 14.0, ATRIB)
GO TO 130
END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ4 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
    CALL RMOVE(1, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 150
      END IF
    160 CONTINUE
  150 CONTINUE
END IF
ELSE
  CANCEL = CANCEL + 1
ENDIF
RETURN
END

*************************************************************************************
****
* The following routine is used to schedule training for class*
* SYS400 class seven of nine per year.
* *************************************************************************************
****
SUBROUTINE SY400G
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(21, 365.0, ATRIB)
SIZE = 45

231
NUMQ4 = NNQ(4)  
NUMQ41 = NNQ(41)  
PERCNT = 0.70  
TYPE1 = NINT(PERCNT*SIZE)  
TYPE2 = SIZE - TYPE1  
CHECK = NUMQ4 + NUMQ41  
IF ((CHECK .GE. SIZE) THEN  
   IF ( ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2))  
      THEN  
        QUOTA1 = TYPE1  
        QUOTA2 = TYPE2  
        DO 10 I = 1, QUOTA1  
           CALL RMOVE(I, 41, ATRIB)  
           ATRIB(70) = 1  
           ATRIB(65) = TNOW  
           DO 20 J = 1, ROWS  
              IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN  
                AUX(J,70) = 1  
                CALL FILEM(40, ATRIB)  
                CALL SCHDL(34, 14.0, ATRIB)  
                GO TO 10  
              END IF  
           20 CONTINUE  
    10 CONTINUE  
   ELSE IF ( ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1))  
      THEN  
        QUOTA1 = NUMQ41  
        QUOTA2 = SIZE - QUOTA1  
        DO 30 I = 1, QUOTA1  
           CALL RMOVE(I, 41, ATRIB)  
           ATRIB(70) = 1  
           ATRIB(65) = TNOW  
           DO 40 J = 1, ROWS  
              IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN  
                AUX(J,70) = 1  
                CALL FILEM(40, ATRIB)  
                CALL SCHDL(34, 14.0, ATRIB)  
                GO TO 30  
              END IF  
           40 CONTINUE  
      ELSE IF ( ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1))  
      THEN  
        QUOTA1 = NUMQ41  
        QUOTA2 = SIZE - QUOTA1  
        DO 50 I = 1, QUOTA1  
           CALL RMOVE(I, 41, ATRIB)  
           ATRIB(70) = 1  
           ATRIB(65) = TNOW  
           DO 60 J = 1, ROWS  
              IF ( ((AUX(J,7)) .EQ. ATRIB(7)) THEN  
                AUX(J,70) = 1  
                CALL FILEM(40, ATRIB)  
                CALL SCHDL(34, 14.0, ATRIB)  
      232
GO TO 50
END IF

CONTINUE

DO 70 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 80 J = 1, ROWS
        IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 70
        END IF
    80 CONTINUE
90 CONTINUE

END IF

ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN

    QUOTA2 = NUMQ4
    QUOTA1 = SIZE - QUOTA2
    DO 100 I = 1, QUOTA1
        CALL RMOVE(1, 41, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 120 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(40, ATRIB)
                CALL SCHDL(34, 14.0, ATRIB)
                GO TO 110
            END IF
        120 CONTINUE
110 CONTINUE

END IF

ELSE IF (NUMQ41 .EQ. 0) THEN

    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2

233
CALL RMOVE(1, 4, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 140 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(40, ATRIB)
      CALL SCHDL(34, 14.0, ATRIB)
      GO TO 130
   END IF
140 CONTINUE
130 CONTINUE
ELSE IF (NUMQ4 .EQ. 0) THEN
   QUOTA1 = SIZE
   DO 150 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 160 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 150
         END IF
160 CONTINUE
150 CONTINUE
ELSE
   CANCEL = CANCEL + 1
END IF
RETURN
END

********: **********************************************************
****
* The following routine is used to schedule training for class*
* SYS400 class eight of nine per year.
* **************************************************************
****

SUBROUTINE SY400H
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(22, 365.0, ATRIB)

SIZE = 45
NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
        QUOTA1 = TYPE1
        QUOTA2 = TYPE2
        DO 10 I = 1, QUOTA1
            CALL RMOVE(1, 41, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
            DO 20 J = 1, ROWS
                IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
                    AUX(J,70) = 1
                    CALL FILEM(40, ATRIB)
                    CALL SCHDL(34, 14.0, ATRIB)
                    GO TO 10
                END IF
            20 CONTINUE
        10 CONTINUE
        DO 30 I = 1, QUOTA2
            CALL RMOVE(1, 4, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
            DO 40 J = 1, ROWS
                IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
                    AUX(J,70) = 1
                    CALL FILEM(40, ATRIB)
                    CALL SCHDL(34, 14.0, ATRIB)
                    GO TO 30
                END IF
            40 CONTINUE
        30 CONTINUE
    ELSE IF ((NUMQ41 .LT. TYPE1)) THEN
        QUOTA1 = NUMQ41
        QUOTA2 = SIZE - QUOTA1
        DO 50 I = 1, QUOTA1
            CALL RMOVE(1, 41, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
        50 CONTINUE
    END IF
END IF

ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
    QUOTA1 = NUMQ41
    QUOTA2 = SIZE - QUOTA1
    DO 50 I = 1, QUOTA1
        CALL RMOVE(1, 41, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
    50 CONTINUE
END IF
DO 60 J = 1, ROWS
   IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(40, ATRIB)
      CALL SCHDL(34, 14.0, ATRIB)
      GO TO 50
   END IF
60 CONTINUE
50 CONTINUE
DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 70
      END IF
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 90
         END IF
100 CONTINUE
90 CONTINUE
   DO 110 I = 1, QUOTA2
      CALL RMOVE(1, 4, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 120 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 110
         END IF
120 CONTINUE
110 CONTINUE
END IF
236
120 CONTINUE
110 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1, QUOTA2
    CALL RMOVE(1, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 130
      END IF
  140 CONTINUE
  130 CONTINUE
ELSE IF (NUMQ41 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
    CALL RMOVE(1, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 150
      END IF
  160 CONTINUE
  150 CONTINUE
END IF
ELSE
  CANCEL = CANCEL + 1
END IF
RETURN
END

******************************************************************************
****
* The following routine is used to schedule training for class*
* SYS400 class nine of nine per year.
*
******************************************************************************
****

237
SUBROUTINE SY400I
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ4, NUMQ41, QUOTA1, QUOTA2
REAL PERCNT

CALL SCHDL(23, 365.0, ATRIB)

SIZE = 45
NUMQ4 = NNQ(4)
NUMQ41 = NNQ(41)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ4 + NUMQ41
IF (CHECK .GE. SIZE) THEN
  IF ((NUMQ41 .GE. TYPE1) .AND. (NUMQ4 .GE. TYPE2)) THEN
    QUOTA1 = TYPE1
    QUOTA2 = TYPE2
    DO 10 I = 1, QUOTA1
       CALL RMOVE(1, 41, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
       DO 20 J = 1, ROWS
          IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
             AUX(J,70) = 1
             CALL FILEM(40, ATRIB)
             CALL SCHDL(34, 14.0, ATRIB)
             GO TO 10
          END IF
       20 CONTINUE
    10 CONTINUE
  ELSE IF ((NUMQ41 .GT. 0) .AND. (NUMQ41 .LT. TYPE1)) THEN
    ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE1)) THEN
      THEN
QUOTA1 = NUMQ41
QUOTA2 = SIZE - QUOTA1
DO 50 I = 1, QUOTA1
   CALL RMOVE(1, 41, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 60 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 50
      END IF
   CONTINUE
60 CONTINUE
50 CONTINUE
DO 70 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 70
      END IF
   CONTINUE
80 CONTINUE
70 CONTINUE
ELSE IF ((NUMQ4 .GT. 0) .AND. (NUMQ4 .LT. TYPE2)) THEN
   QUOTA2 = NUMQ4
   QUOTA1 = SIZE - QUOTA2
   DO 90 I = 1, QUOTA1
      CALL RMOVE(1, 41, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 100 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(40, ATRIB)
            CALL SCHDL(34, 14.0, ATRIB)
            GO TO 90
         END IF
      CONTINUE
100 CONTINUE
90 CONTINUE
DO 110 I = 1, QUOTA2
   CALL RMOVE(1, 4, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 120 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(40, ATRIB)
         CALL SCHDL(34, 14.0, ATRIB)
         GO TO 110
      END IF
   CONTINUE
110 CONTINUE
120 CONTINUE
IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
  AUX(J,70) = 1
  CALL FILEM(40, ATRIB)
  CALL SCHDL(34, 14.0, ATRIB)
  GO TO 110
END IF

120 CONTINUE

110 CONTINUE

ELSE IF (NUMQ41 .EQ. 0) THEN
  QUOTA2 = SIZE
  DO 130 I = 1,QUOTA2
    CALL RMOVE(I, 4, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 130
      END IF
    140 CONTINUE
  130 CONTINUE
END IF

140 CONTINUE

130 CONTINUE

ELSE IF (NUMQ4 .EQ. 0) THEN
  QUOTA1 = SIZE
  DO 150 I = 1, QUOTA1
    CALL RMOVE(I, 41, ATRIB)
    ATRIB(70) = 1
    ATRIB(65) = TNOW
    DO 160 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(40, ATRIB)
        CALL SCHDL(34, 14.0, ATRIB)
        GO TO 150
      END IF
    160 CONTINUE
  150 CONTINUE
END IF

160 CONTINUE

150 CONTINUE

ELSE
  CANCEL = CANCEL + 1
END IF
END IF

RETURN

END
* Subroutine GRD400 represents the graduation of individuals
* from the numerous acquisition courses taken for APDP certi-
* fication. This routine updates their records to
* reflect the new course and call subroutine ACQLOG for a new
* evaluated certification.
*
***************************************************************
****

SUBROUTINE GRD400
INCLUDE '/usr/local/Slam/PARAM INC'
INCLUDE 'USER.ONE'

REAL NUM, SCHOOL, TODAY, TIME

TODAY = TNOW
SCHOOL = 14
NUM = NNQ(40)
DO 10 I = 1, NUM
   CALL RMOVE(1, 40, ATRIB)
   TIME = TODAY - ATRIB(65)
   IF (TIME .GE. SCHOOL) THEN
      DO 20 J = 1, ROWS
         IF (ATRIB(7) .EQ. AUX(J,7)) THEN
            AUX(J,44) = 103
            ATRIB(44) = 103
            AUX(J,70) = 0
            ATRIB(70) = 0
            AUX(J,54) = 0
            ATRIB(54) = 0
            GO TO 30
         END IF
      20 CONTINUE
   30 GD400 = GD400 + 1
   IF (ATRIB(56) .EQ. 1) THEN
      IF (ATRIB(62) .EQ. 1) THEN
         CALL FILEM(31, ATRIB)
      ELSE
         CALL FILEM(3, ATRIB)
      END IF
   ELSE IF (ATRIB(57) .EQ. 1) THEN
      IF (ATRIB(62) .EQ. 1) THEN
         CALL FILEM(31, ATRIB)
      ELSE
         CALL FILEM(3, ATRIB)
      END IF
   ELSE
      CALL FILEM(3, ATRIB)
   END IF
241
END IF
ELSE
    CALL FILEM(40, ATRIB)
END IF
10 CONTINUE
RETURN
END

*******************************************************************************
****
* The following subroutine, SPLCRS, schedule individual to
* attend one of the many recommended acquisition specialty
* courses for APDP certification.
*
*******************************************************************************
****

SUBROUTINE SPLCRS
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

INTEGER SIZE, CHECK, NUMQ3, NUMQ31, NEED, QUOTA1, QUOTA2
REAL PERCNT

IF (SPECL .LT. 12) THEN
    CALL SCHDL(24, 28.0, ATRIB)
    SPECL = SPECL + 1
END IF

SIZE = 850
NUMQ3 = NNQ(3)
NUMQ31 = NNQ(31)
PERCNT = 0.70
TYPE1 = NINT(PERCNT*SIZE)
TYPE2 = SIZE - TYPE1
CHECK = NUMQ3 + NUMQ31
IF (CHECK .GE. SIZE) THEN
    IF ((NUMQ31 .GE. TYPE1) .AND. (NUMQ3 .GE. TYPE2)) THEN
        QUOTA1 = TYPE1
        QUOTA2 = TYPE2
        DO 10 I = 1, QUOTA1
            CALL RMOVE(I, 31, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
    END IF
END IF

242
DO 20 J = 1, ROWS
   IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
      AUX(J,70) = 1
      CALL FILEM(30, ATRIB)
      CALL SCHDL(35, 7.0, ATRIB)
      GO TO 10
   END IF
20 CONTINUE
10 CONTINUE
DO 30 I = 1, QUOTA2
   CALL RMOVE(I, 3, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 40 J = 1, ROWS
      IF (REAL(AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(30, ATRIB)
         CALL SCHDL(35, 7.0, ATRIB)
         GO TO 30
      END IF
40 CONTINUE
30 CONTINUE
ELSE IF ((NUMQ31 .GT. 0) .AND. (NUMQ31 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ31
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(I, 31, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(30, ATRIB)
            CALL SCHDL(35, 7.0, ATRIB)
            GO TO 50
         END IF
60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ31 .GT. 0) .AND. (NUMQ31 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ31
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(I, 31, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(30, ATRIB)
            CALL SCHDL(35, 7.0, ATRIB)
            GO TO 50
         END IF
60 CONTINUE
50 CONTINUE
ELSE IF ((NUMQ31 .GT. 0) .AND. (NUMQ31 .LT. TYPE1)) THEN
   QUOTA1 = NUMQ31
   QUOTA2 = SIZE - QUOTA1
   DO 50 I = 1, QUOTA1
      CALL RMOVE(I, 31, ATRIB)
      ATRIB(70) = 1
      ATRIB(65) = TNOW
      DO 60 J = 1, ROWS
         IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
            AUX(J,70) = 1
            CALL FILEM(30, ATRIB)
            CALL SCHDL(35, 7.0, ATRIB)
            GO TO 50
         END IF
60 CONTINUE
50 CONTINUE
DO 70 I = 1, QUOTA2
   CALL RMOVE(I, 3, ATRIB)
   ATRIB(70) = 1
   ATRIB(65) = TNOW
   DO 80 J = 1, ROWS
      IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
         AUX(J,70) = 1
         CALL FILEM(30, ATRIB)
         CALL SCHDL(35, 7.0, ATRIB)
         GO TO 70
      END IF
80 CONTINUE
70 CONTINUE
70 CONTINUE

ELSE IF ((NUMQ3 .GT. 0) .AND. (NUMQ3 .LT. TYPE2)) THEN

    QUOTA2 = NUMQ3
    QUOTA1 = SIZE - QUOTA2
    DO 90 I = 1, QUOTA1
        CALL RMOVE(1, 31, ATRIB)
        ATRIB(70) = 1
        ATRIB(65) = TNOW
        DO 100 J = 1, ROWS
            IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                AUX(J,70) = 1
                CALL FILEM(30, ATRIB)
                CALL SCHDL(35, 7.0, ATRIB)
                GO TO 90
            END IF
        100 CONTINUE
    90 CONTINUE

    ELSE IF (NUMQ31 .EQ. 0) THEN
        QUOTA2 = SIZE
        DO 130 I = 1, QUOTA2
            CALL RMOVE(1, 3, ATRIB)
            ATRIB(70) = 1
            ATRIB(65) = TNOW
            DO 140 J = 1, ROWS
                IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                    AUX(J,70) = 1
                    CALL FILEM(30, ATRIB)
                    CALL SCHDL(35, 7.0, ATRIB)
                    GO TO 130
                END IF
            140 CONTINUE
        130 CONTINUE

    ELSE IF (NUMQ3 .EQ. 0) THEN
        QUOTA1 = SIZE
        DO 150 I = 1, QUOTA1

        ELSE IF (NUMQ31 .EQ. 0) THEN
            QUOTA2 = SIZE
            DO 130 I = 1, QUOTA2
                CALL RMOVE(1, 3, ATRIB)
                ATRIB(70) = 1
                ATRIB(65) = TNOW
                DO 140 J = 1, ROWS
                    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
                        AUX(J,70) = 1
                        CALL FILEM(30, ATRIB)
                        CALL SCHDL(35, 7.0, ATRIB)
                        GO TO 130
                    END IF
                140 CONTINUE
            130 CONTINUE

        ELSE IF (NUMQ3 .EQ. 0) THEN
            QUOTA1 = SIZE
            DO 150 I = 1, QUOTA1

ELSE IF ((NUMQ3 .GT. 0) .AND. (NUMQ3 .LT. TYPE2)) THEN

    QUOTA2 = NUMQ3
    QUOTA1 = SIZE - QUOTA2
    DO 90 I = 1, QUOTA1
       CALL RMOVE(I, 31, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
    DO 100 J = 1, ROWS
       IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(30, ATRIB)
          CALL SCHDL(35, 7.0, ATRIB)
          GO TO 90
       END IF
100 CONTINUE
90 CONTINUE

ELSE IF (NUMQ3 .EQ. 0) THEN

    QUOTA2 = SIZE
    DO 130 I = 1, QUOTA2
       CALL RMOVE(I, 3, ATRIB)
       ATRIB(70) = 1
       ATRIB(65) = TNOW
    DO 140 J = 1, ROWS
       IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
          AUX(J,70) = 1
          CALL FILEM(30, ATRIB)
          CALL SCHDL(35, 7.0, ATRIB)
          GO TO 130
       END IF
140 CONTINUE
130 CONTINUE

ELSE IF (NUMQ3 .EQ. 0) THEN

    QUOTA1 = SIZE
    DO 150 I = 1, QUOTA1

244
CALL RMOVE(1, 31, ATRIB)
ATRIB(70) = 1
ATRIB(65) = TNOW
DO 160 J = 1, ROWS
    IF ((AUX(J,7)) .EQ. ATRIB(7)) THEN
        AUX(J,70) = 1
        CALL FILEM(30, ATRIB)
        CALL SCHDL(35, 14.0, ATRIB)
        GO TO 150
    END IF
160 CONTINUE
150 CONTINUE
END IF
ELSE
    CANCEL = CANCEL + 1
END IF
RETURN
END

******************************************************************************************
***
* Subroutine GRD999 represents the graduation of individuals
* from the numerous specialty courses taken for APDP certification. This routine updates their records to
* reflect the new course and call subroutine ACQLOG for a new
* evaluated certification.
*
******************************************************************************************
****

SUBROUTINE GRD999
INCLUDE '/usr/local/Slam/PARAM.INC'
INCLUDE 'USER.ONE'

REAL NUM, SCHOOL, TODAY, TIME

TODAY = TNOW
SCHOOL = 7
NUM = NNQ(30)
DO 10 I = 1, NUM
    CALL RMOVE(1, 30, ATRIB)
    TIME = TODAY - ATRIB(65)
    IF (TIME .GE. SCHOOL) THEN
        DO 20 J = 1, ROWS

IF ((ATRIB(7)) .EQ. AUX(J,7)) THEN
    IF (ATRIB(43) .EQ. 0) THEN
        AUX(J,43) = 999
        ATRIB(43) = 999
    ELSE IF (ATRIB(46) .EQ. 0) THEN
        AUX(J,46) = 888
        ATRIB(46) = 888
    ELSE IF (ATRIB(47) .EQ. 0) THEN
        AUX(J,47) = 777
        ATRIB(47) = 777
    END IF
    AUX(J,70) = 0
    ATRIB(70) = 0
    IF (ATRIB(53) .EQ. 1) THEN
        AUX(J,53) = 0
        ATRIB(53) = 0
    ELSE IF (ATRIB(56) .EQ. 1) THEN
        AUX(J,56) = 0
        ATRIB(56) = 0
    ELSE IF (ATRIB(57) .EQ. 1) THEN
        AUX(J,57) = 0
        ATRIB(57) = 0
    END IF
    GO TO 30
END IF
CONTINUE
GDSPL = GDSPL + 1
30 IF (ATRIB(55) .EQ. 1) THEN
    IF (ATRIB(62) .EQ. 1) THEN
        CALL FILEM(25, ATRIB)
    ELSE
        CALL FILEM(22, ATRIB)
    END IF
ELSE IF (ATRIB(54) .EQ. 1) THEN
    IF (ATRIB(62) .EQ. 1) THEN
        CALL FILEM(41, ATRIB)
    ELSE
        CALL FILEM(4, ATRIB)
    END IF
ELSE IF (ATRIB(56) .EQ. 1) THEN
    IF (ATRIB(62) .EQ. 1) THEN
        CALL FILEM(31, ATRIB)
    ELSE
        CALL FILEM(3, ATRIB)
    END IF
ELSE IF (ATRIB(57) .EQ. 1) THEN
    IF (ATRIB(62) .EQ. 1) THEN
        CALL FILEM(31, ATRIB)
    ELSE
        CALL FILEM(3, ATRIB)
    END IF
ELSE
    CALL FILEM(3, ATRIB)
END IF
END IF
ELSE
   CALL FILEM(30, ATRIB)
END IF
10 CONTINUE
RETURN
END
### Appendix G

SLAM Simulation Output

#### 1991 Training Baseline

**Statistics for Time-Persistent Variables**

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**50% TRAINING INCREASE**

**STATISTICS FOR TIME-PERSISTENT VARIABLES**

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251
**Training Increase**

**Statistics for Time-Persistent Variables**

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Appendix H

Course Quotas For Training

The following course quotas were provided by AFIT/LSA and used throughout the analysis of this thesis effort:

SYS100: 30 per course offering (2 per year)
SYS200: 72 per course offering (5 per year)
SYS225: 48 per course offering (7 per year)
SYS400: 30 per course offering (9 per year)
SPECIALTY COURSE: 650 per course offering. (Group emulation once each month)
### Appendix I

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266
Backlog Training Demand
Based on 1991 Training Capability

YEAR

BACKLOG POPULATION

263
Backlog Training Demand
50% Training Increase

YEAR

BACKLOG POPULATION

269
Backlog Training Demand
100% Training Increase

YEAR

BACKLOG POPULATION
Backlog Training Demand
150% Training Increase

YEAR
BACKLOG POPULATION

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
0 100 200 300 400 500 600

BACKLOG POPULATION
Backlog Training Demand
200% Training Increase

YEAR
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

BACKLOG POPULATION
Backlog Training Demand
≤50% Training Increase

YEAR
BACKLOG POPULATION
Maximum SYS100 Demand
Based on 1991 Training Capability
Maximum SYS100 Demand
50% Training Increase

YEAR
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
COURSE DEMAND

275
Maximum SYS100 Demand
100% Training Increase

YEAR

COURSE DEMAND

276
Maximum SYS100 Demand
150% Training Increase

YEAR
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

COURSE DEMAND

277
Maximum SYS100 Demand
200% Training Increase

YEAR

COURSE DEMAND
Maximum SYS100 Demand
250% Training Increase

YEAR

COURSE DEMAND
Maximum SYS200 Demand
Based on 1991 Training Capability
Maximum SYS200 Demand

50% Training Increase

YEAR

COURSE DEMAND
Maximum SYS200 Demand
100% Training Increase

YEAR

COURSE DEMAND

282
Maximum SYS200 Demand
150% Training Increase

YEAR

COURSE DEMAND
Maximum SYS200 Demand
200% Training Increase

YEAR

COURSE DEMAND
Maximum SYS200 Demand
250% Training Increase
Maximum SYS225 Demand
Based on 1991 Training Capability

YEAR

COURSE DEMAND
Maximum SYS225 Demand

50% Training Increase

YEAR

COURSE DEMAND

287
Maximum SYS225 Demand
100% Training Increase

YEAR

COURSE DEMAND
Maximum SYS225 Demand
150% Training Increase

YEAR

COURSE DEMAND
Maximum SYS225 Demand
200% Training Increase

YEAR

COURSE DEMAND

290
Maximum SYS225 Demand
250% Training Increase

YEAR

COURSE DEMAND
Maximum SYS400 Demand
Based on 1991 Training Capability

[Bar chart showing course demand over the years]
Maximum SYS400 Demand
50% Training Increase

YEAR
COURSE DEMAND
Maximum SYS400 Demand
100% Training Increase

YEAR

COURSE DEMAND
Maximum SYS400 Demand
150% Training Increase

YEAR

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

COURSE DEMAND
Maximum SYS400 Demand
200% Training Increase

YEAR

COURSE DEMAND
Maximum SYS400 Demand
250% Training Increase

YEAR

COURSE DEMAND
Specialty Course Demand
Based on 1991 Training Capability

YEAR

COURSE DEMAND
Specialty Course Demand
50% Training Increase

YEAR

COURSE DEMAND
Specialty Course Demand
100% Training Increase

YEAR

COURSE DEMAND

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28

COURSE DEMAND

300
Specialty Course Demand
150% Training Increase

YEAR

COURSE DEMAND
Specialty Course Demand
200% Training Increase

YEAR

COURSE DEMAND
Specialty Course Demand
250% Training Increase

YEAR

COURSE DEMAND

0 2 4 6 8 10 12 14 16 18 20 22 24 26 28
Minimum SYS100 Demand
Based on 1991 Training Capability

YEAR

COURSE DEMAND
Minimum SYS100 Demand
50% Training Increase

YEAR

COURSE DEMAND
Minimum SYS100 Demand
100% Training Increase

YEAR

COURSE DEMAND
Minimum SYS100 Demand
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YEAR

COURSE DEMAND
Minimum SYS100 Demand
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YEAR

COURSE DEMAND
Minimum SYS100 Demand
250% Training Increase

YEAR

COURSE DEMAND
Minimum SYS200 Demand
Based on 1991 Training Capability

YEAR

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Minimum SYS200 Demand
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250% Training Increase

YEAR

COURSE DEMAND
Minimum SYS225 Demand
Based on 1991 Training Capability

YEAR

COURSE DEMAND
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YEAR

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COURSE DEMAND
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200% Training Increase

YEAR

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Minimum SYS225 Demand
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YEAR

COURSE DEMAND
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YEAR

COURSE DEMAND
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250% Training Increase

YEAR

COURSE DEMAND
Maximum Course Demands
Based on 1991 Training Capability

COURSE DEMAND

YEARS


SYS-100  SYS-200  SYS-225  SYS-400
Maximum Course Demands
50% Training Increase
Maximum Course Demands
100% Training Increase

COURSE DEMAND

YEARS


SYS-100 SYS-200 SYS-225 SYS-400
Maximum Course Demands
200% Training Increase

COURSE DEMAND

YEARS


SYS-100 SYS-200 SYS-225 SYS-400
Minimum Course Demands
Based on 1991 Training Capability

COURSE DEMAND

YEARS


SYS-100 SYS-200 SYS-225 SYS-400
Minimum Course Demands
50% Training Increase

COURSE DEMAND

YEARS


SYS-100  SYS-200  SYS-225  SYS-400

333
Minimum Course Demands
100% Training Increase

COURSE DEMAND

YEARS


COURSE DEMAND

0 100 200 300 400 500 600

SYS-100
SYS-200
SYS-225
SYS-400
Minimum Course Demands
200% Training Increase

COURSE DEMAND

YEARS


COURSE DEMAND

0 100 200 300 400 500 600

SYS-100
SYS-200
SYS-225
SYS-400
Appendix K

Randomize Sample Selection Routine

EXTERNAL RNUNF
INTRANsic REAL, NINT

INTEGER ROWS, COLS, ROWS1, I

PARAMETER(ROWS=9116, ROWS1=1000, COLS=40)

INTEGER POP(ROWS1, COLS), AUX(ROWS, COLS), CHOICE(ROWS)

OPEN(UNIT=10, FILE='NEW.DAT', STATUS='OLD')
OPEN(UNIT=12, FILE='POP.DAT', STATUS='NEW')

DO 10 I = 1, ROWS
   DO 20 J = 1, COLS
      AUX(I,J) = 0
   20 CONTINUE
  10 CONTINUE

DO 30 I = 1, ROWS
   READ(10,100,END=41) (AUX(I,J), J=1,40)
  30 CONTINUE
  41 CLOSE(10)

100 FORMAT(I8, 5(I8,I3), 1X, I8, 9(I8,I3), 24(I8,I4))

DO 200 J=1,ROWS
   CHOICE(J) = 0
  200 CONTINUE

DO 300 II = 1, ROWS1
   CONTINUE
   TEMP=RNUNF()
   JJ = NINT(TEMP*ROWS)
   IF ((JJ .LE. ROWS) .AND. (JJ .GT. 0)) THEN
      DO 400 K = 1,ROWS
         IF (JJ .EQ. CHOICE(K)) GO TO 14
      400 CONTINUE
   IF (JJ .EQ. CHOICE(K)) GO TO 14

   DO 500 KK = 1, COLS
      POP(II, KK) = AUX(JJ, KK)

   338
500 CONTINUE
    CHOICE(II) = JJ
ELSE
    GO TO 14
END IF
300 CONTINUE

DO 600 LL = 1, ROWS1
    WRITE(12,100) (POP(LL,N), N=1, COLS)
600 CONTINUE
END
Bibliography


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Vita

Captain Paul A. Nicholson was born on 4 July 1964 in Rocky Mount, North Carolina. He graduated from Southeast Halifax High School in 1982. After high school, he attended North Carolina Central University where he majored in the fields of Math and Computer Science. While at North Carolina Central University, he cross-enrolled in the Air Force Reserve Officer Training Corps at Duke University. Upon receiving his degree in 1986, he was commissioned into the Air Force and assigned to the 1912 Computer Systems Group at Langley AFB, Virginia where he served as a Test Manager for Joint Tactical Command and Control Systems. Captain Nicholson remained at Langley AFB until his selection to the Air Force Institute of Technology, School of Engineering, Department of Operational Research in 1990.


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