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A HEURISTIC APPROACH FOR CLASS-SCHEDULING

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ABSTRACT

Scheduling problems are among the most challenging problems in applied mathematics. Solution procedures for most of these problems, however, are not among the most elegant.

Theoretical models have been constructed in some cases but the huge size of most real-life scheduling problems do not allow the solution procedures to these models to be computationally feasible or economical. In many cases, therefore, approximate solutions called heuristic solutions which generate "good" rather than optimum solutions, must be used. One such case is the class schedule construction.

In this research a theoretical model, based on network flow theory, is developed which lends itself to solution procedures that are computationally feasible. The model is for the case where a class schedule exists (such as a school's previous year class schedule) and the problem is to schedule students into their requested courses such that total number of students encountering conflicts is kept at a minimum.

A heuristic scheduling algorithm, composed of several algorithms for different types of courses, is developed which is suitable for traditional and modified school structures. The traditional school structure is considered as that in which each class meets once for one period of a scheduling cycle (normally a day). A modified school structure is similar to the traditional structure but allows for class meetings of more than one successive period.

The algorithms are implemented and tested on an actual data set for a school of complex, modified structure. The overall algorithm, after ranking the courses according to an index of difficulty processes one course or a group of courses at a time, using a special algorithm, in each case, based on the type of courses being processed.

The computational experience presented shows that:

(a) The algorithm is quite efficient and therefore economical.

(b) The algorithm is effective in class scheduling for traditional and modified school structures. In the case of a complex modified school structure the algorithm reduced the number of students encountering conflicts to less than one-half compared to a manually constructed schedule.

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CHAPTER I

INTRODUCTION

School scheduling is the process of building a time schedule of courses such that the number of student schedule conflicts are minimized, and the utilization of space, time, and teachers is optimized. It is assumed that students request the courses that they would like to take and based on these requests, the schedule, called a master schedule, is constructed. The master schedule is a time schedule of courses. When constructing a master schedule many factors must be considered, some of which include the following: There is a limited number of teachers, each having his own time limitations and class preferences. There is a limited number of classrooms, some special purpose classrooms such as laboratories and other general purpose rooms with different capacities. There is a limited number of time periods at which a large number of courses must be scheduled. Some courses may require more than one period per meeting. Some courses should be scheduled such that there is a minimum time lapse between two successive meetings of the course. A group of courses should be scheduled at different time periods because of teachers or room constraints. There are courses which offer more than one section, each section having a limited number of seats available, etc. The above list of factors involved in scheduling is by no means complete. Other considerations may be important depending on the particular characteristics of the school.

There have been two general solution approaches in attacking a scheduling problem, mathematical or exact methods and heuristic or methods based on intuition and past experience.

The school scheduling problem, even in its general form, could be formulated mathematically. The solution to this mathematical formulation would give the best possible schedule for a given set of restrictions. It is not feasible, however, to solve such a problem by exact mathematical techniques with existing solution procedures and computers. Computer capabilities, however, have been exploited to develop general purpose scheduling programs. These programs are usually based on past experience, intuitive techniques, or mathematical techniques. Such scheduling programs generally are designed to perform scheduling for a wide range of schools. Since each school has its own type of constraints and limitations general purpose programs must consider every conceivable constraint, and limitation in order to be very general. However, such programs often can become highly inefficient, uneconomical, and difficult to implement because of their complexity.

A more realistic approach would be to develop a relatively small program tailor made to consider some of the most important factors common in many local schools. Such a program could be designed small enough to be economical, flexible enough to be able to schedule a wide range of local schools, and incorporate several heuristics combined with mathematical optimization techniques to develop good schedules with few student conflicts.

As far as problem definition is concerned, three broad categories of practical scheduling or time-tabling problems could be identified:

(a) First is the case where originally a master schedule exists and the problem concerns scheduling of students to time blocks.

(b) Second is the case where a specified number of periods are given and classes and students must be scheduled to minimize the number of conflicts.

(c) Third is the case where the assumption is that conflicts must not occur and it is tried to find a minimum number of periods.

In subsequent chapters possibilities are investigated in developing a model, applicable to category (a), for scheduling students into a given class-schedule in an optimal fashion.

It is also intended to develop a heuristic algorithm, applicable to category (b), for constructing a class-schedule, i.e., assigning a set of courses, which are requested by a group of students, to a set of time periods while scheduling students into the courses that they have requested. It is felt that heuristic and mathematical optimization techniques could be incorporated into the algorithm in order to develop class-schedules with relatively few student conflicts.

Specifically, optimization techniaues would be used in an attempt to schedule a group of teacher or room restricted courses at the same time. An attempt would also be made to construct a model and an efficient technique for scheduling multi-section courses. Finally, it is desired to develop a computer program, based on the above-mentioned algorithm, specifically for schools with traditional and modified structures. This computer program will be implemented and tested using actual data and will be small as far as main memory is concerned such that it could also be implemented on small computer installations frequently available to many secondary schools.

CHAPTER II

LITERATURE REVIEW

2.1. Exact Mathematical Methods

A simplified but actual case of the problem of scheduling which is of the second category is described as follows:

There are N periods (non-overlapping) into which courses can be scheduled. A course can go into any of the N periods, and we can ignore teacher or classroom schedules. There are J courses, with some courses having only one section and others ranging up to five sections. There are no differences between several sections of a course. There are I students, and each student lists L courses he would like to take. The goal is to schedule courses so as to minimize the number of student "conflicts" that arise.

A more simple case of the above problem is when all courses have only one section which could be considered as a problem of scheduling activities among facilities in such a way to minimize the conflict cost. In this case the restrictions are:

1. Each activity (course) must be assigned to one and only one facility (time blocks).
2. Any number of activities could be assigned to a facility.
3. If two activities are assigned to a facility a cost would be incurred, such as number of conflicts when two courses are scheduled at the same time.
4. There is no conflict between facilities (time blocks do not overlap).

This problem could be formulated as a quadratic assignment problem as follows:

$$\text{Min} \quad z = \tfrac{1}{2} \sum_{j=1}^{n} \sum_{i=1}^{m} \sum_{k=1}^{m} a_{ik}\, x_{ij}\, x_{kj}$$

$$\text{s.t.} \quad \sum_{j=1}^{n} x_{ij} = 1 \qquad i = 1,\ldots,m$$

$$x_{ij} = 0 \text{ or } 1 \qquad i = 1,\ldots,m; \quad j = 1,\ldots,n$$

where:

z = the total number of conflicts

m = number of courses

n = number of time periods (for nontrivial solution $m > n$).

a_{ik} = number of conflicts if course i and k are both assigned to time block j which equals the number of students requesting to take both courses i and k. a_{ii} is the cost of scheduling any course with itself, then $a_{ii} = 0$.

$$x_{ij} = \begin{cases} 1 \text{ if course i is assigned to time block j} \\ 0 \text{ otherwise} \end{cases}$$

Since there are a finite number of feasible solutions total enumeration could be one way of finding an optimum solution. If N_i is the number of time periods to which course i can be assigned, the number of feasible solutions would be $\prod_{i=1}^{n} N_i$ where n is the number of courses. It is seen that for large n total enumeration is out of the question.

Except for relatively small sized problems, an exact solution to the quadratic assignment problem cannot be obtained at a reasonable computational cost. Exact procedures that have been developed so far are mostly branch and bound, or implicit enumeration. Francis and White [50] indicate that branch and bound procedures are normally unable to solve problems where number of variables are greater than 15. In the case of total enumeration they indicate that the time required to solve a problem with n=12 on an even new-generation computer would be infeasible. Heuristic solution procedures, therefore, are generally used to obtain "good" solutions. Work in both exact and heuristic areas has been done by Gilmore [1], Lawler [3], Broder [7], Hillier [46], Nuget, Vollmann and Ruml [47], Pierce and Crowston [48], Hanan and Kurtzberg [49], Geoffrion and Graves [51].

Considering the formulation given above it was shown by Carlson and Nemhauser [5] that (a) the integer constraints are not required; (b) because of the special structure of the model, an algorithm, considerably more efficient than existing quadratic programming algorithms, is possible; (c) since the cost function is not convex only local minima are obtainable.

Lawler [3] shows that the quadratic assignment problem is equivalent to an integer linear program as follows.

Suppose the quadratic assignment problem is

$$\text{Min} \quad \Sigma_{ij}\ \Sigma_{pq}\ c_{ijpq}\ x_{ij}\ x_{pq}$$

$$\text{S.T.} \quad \Sigma_j\ x_{ij} = 1 \qquad i = 1,\dots,n$$

$$\Sigma_i\ x_{ij} = 1 \qquad j = 1,\dots,n$$

$$x_{ij} = 0,\ 1 \qquad i,j = 1,\dots,n$$

Then assuming

$$y_{ijpq} = x_{ij}\ x_{pq}$$

The problem becomes

$$\text{Min} \quad \Sigma_{ijpq}\ c_{ijpq}\ y_{ijpq}$$

$$\text{S.T.} \quad \Sigma_j\ x_{ij} = 1 \qquad i = 1,\dots,n$$

$$\Sigma_i\ x_{ij} = 1 \qquad j = 1,\dots,n$$

$$\Sigma_{ijpq}\ y_{ijpq} = n^2$$

$$x_{ij} + x_{pq} - 2y_{ijpq} \geq 0 \qquad i,j,p,q = 1,2,\dots,n$$

$$x_{ij} = 0 \text{ or } 1 \qquad i,j = 1,\dots,n$$

$$y_{ijpq} = 0 \text{ or } 1 \qquad i,j,p,q = 1,2,\dots,n$$

It is seen that the quadratic assignment problem has n^2 variables but the integer linear problem has $n^4 + n^2$ variables. This shows that transforming the problem from quadratic form to integer linear form is not computationally helpful, considering the present state of the integer programming algorithms. Lawler states that "the quadratic assignment problem is a finite problem. In principle, each of the n! feasible solutions could be evaluated to find the minimum. Alternatively, existing integer programming techniques could be applied to the equivalent linear problem. However, neither of these alternatives is attractive."

Davis, Devine, and Lutz [7] take a problem such as the above and further assume that two facilities operations could be in conflict (overlapping time blocks). Their formulation of the problem is the same as the quadratic assignment problem above, in addition, they introduce a coefficient t_{pq} as a coefficient in the objective function as follows:

$$t_{pq} = \begin{cases} 1 \text{ if the operation of facility p and facility q} \\ \quad \text{is in conflict, therefore } t_{pp}=1 \text{ for } p=1,\ldots,m \\ 0 \text{ if the operation of the facility p and facility} \\ \quad \text{q is not in conflict, note that } t_{pq} = t_{qp}. \end{cases}$$

They develop necessary optimality conditions and then develop an algorithm (an extension of the algorithm developed in [5]) that converges to a local optimum or to a point that satisfies necessary conditions for optimality. Since the computation time of major steps of the algorithm is related linearly (but not exponentially) to the number of variables, the algorithm is computationally feasible for large problems. Murikipudi [45] compares computational results using this algorithm called "LO-OPT" versus two other heuristic algorithms. One of the latter two algorithms is developed by Murikipudi himself and is called "PAM", short for "Preference Allotment Method." The other algorithm is called "ONE-OPT" and developed by Devine, Kumin and Lutz [44] for scheduling the one-section classes in the Oklahoma City public schools. The three algorithms are all designed to be used for single-section scheduling problems when conflicting time blocks are present. Murikipudi considers 15 problems where number of classes range between 8 and 40 and number of time blocks are between 4 and 15. His results indicate that LO-OPT generally gives better results. Once a solution of a problem reached a local optimum, however, LO-OPT cannot improve the solution further. The size of the computer program for obtaining solutions using LO-OPT is relatively large and therefore not very attractive for implementation on small computers. The problem of scheduling one-section courses to minimize number of conflicts is the same as the problem of scheduling final examinations. Efforts have been made to approach the problem of an examination schedule which requires a minimum number of periods and satisfies the constraint that no student be required to take two exams simultaneously. Example of work in this area is Hall and Acton [8]. Basically, they first group together, in all possible ways, those courses which may have their examinations scheduled at the same period. Then a minimum number of these groups are selected such that each course is included at least once. Finally, they obtain a minimum schedule by removing multiple occurrences of courses and scheduling each group at a different period.

Another approach to solving one-section problem might be to find a way to decompose the problem into several smaller independent problems and solve these problems independently. It is noticed that the constraints could be decomposed by the course number. The question is whether the objective function could also be decomposed? Since students take courses basically in their own area of interest it seems logical that the conflict matrix may be changed to have the arrangement of blocks of course conflicts along the diagonal. Weil and Kettler [9] propose a rearrangement for the linear programming problem constraints matrix. They suggest that if a large linear programming problem has a suitable block-angular structure, one of a time-saving decomposition algorithms could be used. Another idea in this respect is the analogy between identification of subproblems in one-section problem and isolating the disconnected subgraphs of a directed graph. It seems reasonable that by using some ideas from theories of directed graphs the problem could be subdivided into several smaller problems and solved independently.

Another avenue of study in school scheduling problems has been teacher-class-time schedules. In this kind of problem conflicts are not allowed and it is desired to find at least one possible schedule. Gotlieb [10] is among those who has done extensive work in this area. In his approach to the problem he assumes that the weekly requirements have been subdivided into five sets of daily requirements. This problem of dividing the weekly requirements into a set of daily requirements can be formulated in the same terms as the problem of finding the time-table to satisfy the daily requirements. Also, to meet these pattern requirements, to provide for hours when some teachers or classes may not be available, and to ensure from the beginning that certain critical facilities (e.g., lunch rooms, science laboratories and gymnasia) are fully utilized, some part of the time table is filled out in advance and the problem is one of completing a partially filled time-table. It is these initial assignments which make the problem difficult. The procedure used by Gotlieb is that the problem is first checked for feasibility in the light of the requirements and initial conditions. This feasibility test is carried out by systematically following through all the implications of the initial assignments. Once feasibility is assured the time-table can easily be constructed and, in fact, all solutions satisfying the initial conditions can be found.

Dempster [11] formulates the class-teacher-time problem as a quadratic assignment problem. His algorithms may be regarded as 3-dimensional generalizations of familiar algorithms for the assignment problem. Matrix reduction techniques have been applied to time-table problems also. In this regard work of Lions [12] could be mentioned. In his article, he describes the application of Kuhn's Hungarian Method to the problem of matrix reduction as needed in Gotlieb's method for time-table generation. The method is suited to both hand and computer calculation. Devices to improve the efficiency of the basic algorithm are discussed. Many other researchers have worked in this area such as Almond [13], Berghuis [14], and Barraclough [15].

In the one-section quadratic assignment problem other constraints could be included to take care of particular situations. One xample could be the case where a set of courses are supposed to meet in a certain class and then the restriction is that those courses should not be assigned to the same or conflicting time blocks. The constraint to be added to the previous set of constraints is

$$\sum_{i \varepsilon p} x_{ij} \leq 1 \qquad j = 1,\ldots,n$$

p is the set of all courses which are supposed to use a particular class.

Other sorts of constraints such as the above (the same teacher for several courses) could be added to the problem.

A more general and realistic scheduling problem is the case where courses could have more than one section. These types of courses are called multi-section courses.

It is assumed that students request a multi-section course itself and not a particular section of the course, and therefore, there is the freedom to assign them arbitrarily to any of the sections of the course. Since, otherwise, if the students choose a section each section could be considered as a one-section course and as a result the problem becomes a one-section assignment problem which could be solved using one of the available algorithms for one-section scheduling. When there are courses which offer more than one section and there is the freedom of assigning the students to any of the sections, then the students individually should be considered because the decision must be made as to which student should be assigned to which section in order to avoid a conflict (or improve the solution). Also, if there is a limit on the number of students who can take a particular section of a course, the students must be scheduled into sections such that there is a balance between the sections at the end, and therefore, attention should be given to individual students. Accordingly, let us consider another formulation of the problem similar to a general formulation developed by Oakford et al. [34], in which the objective is to maximize the number of students' requests satisfied rather than minimizing the number of conflicts. Consider the following formulation for one-section problem when there are m courses, n students, and ℓ time periods.

$$\text{Max} \quad z_0 = \sum_{i=1}^{n} \sum_{j \varepsilon E_i} \sum_{k=1}^{\ell} x(i,j,k)$$

$$\text{S.T.} \quad \sum_{k} y(j,k) = 1 \qquad j = 1,\ldots,m$$

$$x(i,j,k) \leq y(j,k) \qquad i = 1,\ldots,n;\ j \varepsilon E_i;\ k = 1,\ldots,\ell$$

$$\sum_{j \varepsilon E_i} x(i,j,k) \leq 1 \qquad i = 1,\ldots,n;\ k = 1,\ldots,\ell$$

where:

$$x(i,j,k) = \begin{cases} 1 & \text{if student } i \text{ is taking course } j \text{ at time } k \\ 0 & \text{otherwise} \end{cases}$$

$$y(j,k) = \begin{cases} 1 & \text{if course } j \text{ is scheduled at time } k \\ 0 & \text{otherwise} \end{cases}$$

E_i = the set of all courses requested by student i

In the above formulation the objective function maximizes the number of students' requests satisfied.

The first constraint ensures that course j is scheduled at a period k and is scheduled only once. The second constraint ensures that student i could be scheduled into course j at time period k only if course j is scheduled at time k. The third constraint says that student i can take only one of the courses that he is requesting at a period k.

When there are courses which offer more than one section, then the problem could be formulated as follows:

$$\text{Max} \quad z_0 = \sum_{i=1}^{n} \sum_{j \varepsilon E_i} \sum_{s \varepsilon S_j} \sum_{k=1}^{\ell} x(i,j,s,k)$$

$$\text{S.T.} \ \sum_{k} y(j,s,k) = 1 \qquad j = 1,\ldots,m; \quad s = 1,\ldots,S_j$$

$$\sum_{s \varepsilon S_j} x(i,j,s,k) \leq 1 \qquad i \ \varepsilon \ P_j; \quad j \ \varepsilon \ E_i; \quad k = 1,\ldots,\ell$$

$$x(i,j,s,k) \leq y(j,s,k) \qquad i = 1,\ldots,m; \quad j \ \varepsilon \ E_i; \quad s = 1,\ldots,S_j; \quad k = 1,\ldots,\ell$$

$$\sum_{j \varepsilon E_i} \sum_{s \varepsilon S_j} x(i,j,s,k) \leq 1 \qquad i = 1,\ldots,n; \quad k = 1,\ldots,\ell$$

where:

$$x(i,j,s,k) = \begin{cases} 1 & \text{if student } i \text{ is scheduled into section } s \text{ of course } j \text{ at period } k \\ 0 & \text{otherwise} \end{cases}$$

$$y(j,s,k) = \begin{cases} 1 & \text{if section } s \text{ of course } j \text{ is scheduled at time period } k \\ 0 & \text{otherwise} \end{cases}$$

S_j = number of sections of course j

P_j = the set of all the students requesting course j

E_i = the set of all the courses that student i is requesting

If there is a restriction on the number of students who can be scheduled into a section, a constraint such as the following could be added to the above sets of constraints:

$$\sum_{i \varepsilon P_j} x(i,j,s,k) = N_{j_s} \qquad j = 1,\ldots,m; \quad s = 1,\ldots,S_j; \quad k = 1,\ldots,\ell$$

where N_{j_s} is the limit on the number of students who could be scheduled into section s of course j.

If it is required that no more than one section of a course be scheduled at a time period, a constraint such as the following could be added.

$$\sum_{s \in S_j} y(j,s,k) = 1 \qquad j = 1,\ldots,m \quad k = 1,\ldots,\ell$$

This model is very general and almost any other sort of restrictions could be incorporated in it (teacher restrictions, class restrictions, etc.).

Therefore, the problem, even in much more general cases than this could be formulated as a mathematical model. Now the question is that whether a solution could easily be obtained?

For a medium size school of 700 students and 100 courses assuming each student on the average requests 6 courses, each course on the average offers 4 sections, and 6 available time periods, then:

Number of X(i,j,s,k) variables	= 700 * 6 * 4 * 6	= 100,800
Number of Y(j,s,k) variables	= 100 * 4 * 6	= 2,400
<u>Total number of variables</u>		= 103,200
Number of constraints of the first type	= 100 * 4	= 400
Number of constraints of the second type	= 700 * 6 * 6	= 25,200
Number of constraints of the third type	= 700 * 6 * 4 * 6	= 100,800
Number of constraints of the fourth type	= 700 * 6	= 4,200
<u>Total number of constraints</u>		= 130,600

It is seen that for a medium size school total number of (0-1) variables and total number of constraints are both over 100,000. This problem belongs to a class of problems called NP-complete by Karp [58] and the difficulty is not in mathematically formulating the problem but in the computation times required by existing solution methods.

Existing literature about zero-one integer programming problems shows that only problems with small number of variables could be solved by exact algorithms. A good survey article in this area is the one by Geoffrion and Marsten [19]. They discuss computational results for a number of general purpose algorithms for integer linear programming problems. They indicate that using enumerative algorithms large size hospital scheduling problems up to 100 0-1 variables have been solved. Additional computerized experience is presented solving problems with 200 binary variables although strict optimum solutions were not obtained. Geoffrion and Marsten claim that computational experience with cutting plane algorithms has been confined to very small problems. For crew scheduling problems, however, they indicate that large size problems in order of 7,000 binary variables and 150 constraints can often be solved on the order of 40 minutes of CDC 3600 time. Garfinkel and Nemhauser [52] report that scheduling problems of the size of 40 constraints and 131 variables have been solved using enumerative algorithms. For cutting plane algorithms they state that computer programs have been developed which can handle up to 60 constraints and 240 variables. On ILPC-based (Integer Linear Programs over Cones) they report that the largest problem solved had 104 constraints and 236 variables. For knapsack problems they state that problems with 5000 variables were solved. In the case of traveling salesman problem they report the solution of a 42-city problem which has 861 binary variables and 84 assignment constraints. Karney and Klingman [53] report that using an in-core, out-of-core primal network code with an imbedded branch-and-bound code they solved a plant location problem with 3300 nodes, 41,000 arcs in 40 minutes of CDC 6600.

Theoretical developments in recent years, reviewed by Steen [32], indicate that many of the (0,1) integer linear programming problems have a history of unsuccessful searches for optimal solution methods where the computation times grow polynomially rather than exponentially with size of data and many of these problems can be put into a category which can be transformed into a mathematical logic problem called the satisfiability problem. This could strongly indicate the infeasibility of determining optimal solutions which may be computationally feasible. It is concluded by Steen that searches for sufficiently good solutions are now much more common than search for exact algorithms.

Other references in this area are Glover and Klingman [38], Geoffrion [54], Shih [55], Talbot and Patterson [56], and Zanakis [57].

2.2. Heuristic Approaches

It is seen that exact techniques are theoretically applicable to school scheduling problems, however, the relatively large size of any typical school schedule makes the use of techniques impossible. The mathematical approaches would be used more and more in the near future to aid in solving the scheduling problem. Only the heuristic approach has so far had any real success. For example, Holz [2] has developed a program which has been successfully used for high schools and small colleges. This program is called GASP (Generalized Academic Simulation Programs) and is divided into two segments. In the first a time-table is constructed and includes the tasks of making assignments of time, classroom and instructors to each class. In this segment student requests are taken into account, but students are not definitely assigned to classes. In the second segment, students are assigned to classes designated in the time table. The segments may be run separately or together on one continuous run. The second segment of the program "registers" students into the classes of the time-table. Assignment of students to classes is done in such a way as to make possible a general consideration of student preferences, such as time distribution of classes or choice of instructor. To do this, the program can compute a few (10 to 25) workable schedules for each student and, on the basis of any special rules or measurements the school desires, pick the best of these schedules. The various schedules are computed so that they are likely to be quite different from each other, and section sizes remain balanced with high probability. In most instances, the man-hours needed to produce a schedule using GASP is near 25 percent of the time required by traditional methods. The computer time necessary to schedule a school of about 1,000 students is between two and four hours of 7094 (IBM) use and perhaps 30 hours of 1401 (IBM). One of the first workable programs of school scheduling was developed at Purdue University in 1956. Shortly thereafter, International Business Machines developed a scheduling program called CLASS (Class Load and Student Scheduling) [21] based on some of the early work done at Purdue. The CLASS program assigns students to a given master schedule on the following basic priority.

1. The student must get what he asks for.
2. He should not be given a schedule with too many sequential study halls (determined by the school).
3. He will be scheduled into sections in a fashion that tends to maintain a balance in class size.

The way the program CLASS assigns students to courses is that the student is tried in those sections of courses he is requesting that have the most seats available at that given instant. The computer begins this operation for each individual student with those courses requested that have the fewest sections offered and progress to those with the most. In this way one-section courses are scheduled first--as they usually are in manual procedures. The CLASS program was used to schedule 165,000 students in the Cleveland, Ohio-Pittsburgh, Pennsylvania area during one summer. The average number of computer passes made by these schools involving the 165,000 students was two and one-half to achieve scheduling percentage of 95 percent. Computer costs ran approximately 35 cents per student.

Another program taking a different approach from others is called SOCRATES (Scheduling of Classes Realized Automatically Through Effortless Systemization) developed by Wilkes [22]. SOCRATES takes the approach that all students should first be scheduled into those classes which can be taken at only one time during the day. By scheduling initially only "one-chance" courses for all students and passing over all courses that have two chances during the day, a basis of priority can be established. Later, when the time comes that there is no remaining student who has a priority course request, the first two chance course is scheduled. Scheduling the latter type of course could result in the creation of a new one-chance course; therefore, after scheduling a two-chance course for a student, a new attempt is made to schedule one-chance courses for him. Only when there are no single-chance courses left unscheduled is the next two-chance course scheduled. When there are neither single- nor double-chance courses remaining unscheduled, then the first three chance course is scheduled, again returning to the one-chance mode, then the two-chance mode, then finally returning to schedule three-chance courses, and so on.

An algorithm developed by Anderson [23] assumes that a master schedule exists and is already available to the computer. A file of student course requests is translated into a file of actual class assignments very rapidly. This speed permits repeated use of the computer programs, with refinements to the master schedule based on experience with the previous trial. In this context, the assignment algorithm can be used to develop the final master schedule. Anderson's approach tries many alternative possibilities to fit each student into a predetermined master schedule. If after a reasonable number of trials the student cannot be assigned to sections, he is referred to the scheduling staff as an exception. The computer provides a diagnosis of the conflict which frustrated its efforts, but human intervention and analysis is still required.

A system was developed at Stanford University by Oakford et al. [24] called Stanford School Scheduling System (SSSS). They found that the construction of the school schedule was a formidable obstacle. High school administrators are able to construct usable schedules only when virtually all classes conformed to the traditional meeting pattern of one period per day, five days per week. Oakford et al. claim that the scheduling problem in its most general form could be formulated as a linear integer programming problem. The system that they have developed is very general and is supposed to be adaptable to any kind of situation. In solving the scheduling problem they use a heuristic approach as follows:

Schedule (or deschedule and reschedule) sections successively until a situation has been reached where all sections are scheduled and no increase in the objective function could result from descheduling and rescheduling any section. At each step of the scheduling process, the scheduler takes the action that appears to be reasonable in the light of the information available to him at that step. The action at a given step must not conflict with the action taken previously. At a given step in the scheduling process a section should be scheduled (or descheduled and rescheduled) only if that action promises to increase the value of the objective function. A general description of one heuristic approach is given where a set S_c of students that have requested enrollment in course x of which c is a section is partitioned into subsets relevant to the computation of the value of scheduling section c at period p. Also the cost of descheduling section c at period p* is computed. If the value of scheduling section c at period p is greater than the cost of descheduling section c at period p* then deschedule section c from period p* and schedule it at period p. Schedules have been made for schools ranging from 120 to 2600 students. The effectiveness of the schedules, as measured by course requests satisfied, have ranged from acceptable (satisfy at least 90 percent of the requests) to excellent (satisfy at least 98 percent of the requests). The past experience indicates that schedules can be computed at a cost that is acceptable to the schools.

A revised version of the CLASS program called UPDATE has been developed at the Iowa Educational Information Center IEIC of the University of Iowa as reported by Van Dusseldorp and Richardson [25]. The IEIC used what they call a "daisy chain" approach in which students are first passed through the scheduling program in any order they happen to come and are assigned temporary schedules. The results of this first scheduling operation are stored, and then each student is completely rescheduled. He is taken out of the classes into which he was first scheduled and is scheduled again. This method results in the improvement of both class-size balance and individual student schedules.

Washington State University has a program to help scheduling as reported by Faulkner [26]. Some other articles in this area are such as Busam [27], Macon and Walker [28], Lutz, et al. [29], and Holzman [35].

Salazar [37] has developed an approximate interactive algorithm for constructing schedules for traditional high school structures. The traditional structure is characterized by special requirements such as: each class meets once for one period during a scheduling cycle. Salazar indicates that by authoritative estimates over 90 percent of secondary schools in the United States employ a traditional structure.

The algorithm developed by Salazar is based on a integer linear programming formulation, in which after ranking the student file, processes one student at a time by formulating and solving a linear assignment problem.

If the school structure requires multi-period classes the model does not easily lend itself to a simple solution procedure.

In Salazar's algorithm students are first ranked based on the courses that they are requesting. The ranking is done by finding the sum of reciprocals of the number of sections of all the courses requested by a student. As an example, if a student is requesting 6 courses having 1, 1, 2, 3, 4, and 4 sections, then his or her rank is (1/1 + 1/1 + 1/2 + 1/3 + 1/4 + 1/4 = 3.333). Scheduling is done by considering one student at a time according to the ranking scheme. This means that the original scheduling problem is partitioned into small portions simply by considering one student at a time and the interaction between these portions are considered by selecting the order in which the portions are solved, i.e., the ranking scheme. Courses which are restricted to a certain time period or require more than one time period cannot be handled by the algorithm and therefore must be scheduled manually. When a student is considered for scheduling, the courses requested by him or her are identified. For each course that the student is requesting a section(s) is considered to be scheduled at time period $\underline{P}$ (P = no. of time periods, $P = 1,\ldots,\underline{P}$). The following cases could happen:

1. The section is already scheduled at this time period.

A cost would be associated with scheduling the student into this section which is proportional to enrollment in the section divided by average number of students for a section of this course (average number of students for a section = total number of students requesting the course/number of sections).

2. The section is scheduled at another time period, or it is not feasible to schedule the section at this time period because another section is scheduled at this time period which must not be scheduled at the same time with this present section. A very high cost is associated with scheduling the section at this time period, represented by um.

3. It is feasible to schedule the section at time period $\underline{P}$. In this case the cost is the sum of several costs as follows:

   (a) Section s could be restricted by a set of other sections say s_j (for example, s and s_j's are taught by the same teacher) and therefore these sections must not be scheduled at the same time period. Suppose prior to scheduling s, s_1 of s_j sections could be scheduled at $\underline{P}$ and after scheduling s at $\underline{P}$, s_2 of these sections could be scheduled at $\underline{P}$ then $s_1 - s_2$ represents the decrease in the number of feasible possibilities of other sections not yet scheduled if s is scheduled at $\underline{P}$. The cost is proportional to $s_1 - s_2$.

(b) Some of the sections in the set s_j may become critical in the sense that only one time period would remain at which they could feasibly be scheduled. There is a cost associated with creating such sections because of scheduling s at $\underline{P}$.

(c) Some of the sections in the set s_j could become impossible to schedule because no other time period could be found at which their section could feasibly be scheduled after s is scheduled at $\underline{P}$. There is a cost associated with creating such sections because of scheduling s at $\underline{P}$.

(d) A cost proportional to student enrollment at time period $\underline{P}$.

The total cost is the sum of the costs in (a), (b), (c), and (d).

The cost is computed as discussed above for all sections of a course that the student is requesting and the section with minimum cost selected. The procedure is repeated for all time periods and all courses that the student is requesting. An assignment problem is then set up where sections are assigned to time periods at a minimum cost.

All the heuristic approaches discussed here are general purpose approaches and their corresponding computer programs are large in size except for the last approach which is designed for traditional schools. In the last approach, even though the corresponding computer implementation is suitable for small traditional schools, the algorithm itself is inflexible in the sense that it is not designed to consider locked-in courses, several-hour courses, and overlapping time blocks in general.

CHAPTER III

A NETWORK FLOW MODEL FOR SCHEDULING STUDENTS INTO AN EXISTING MASTER SCHEDULE

One type of scheduling problem is the case where originally a class schedule exists, i.e., courses and sections of courses are already assigned to time periods, and the problem concerns scheduling of students into the courses that they have requested.

Such a problem could arise for example at the beginning of a school year, when a school official tries to perform his class scheduling by assigning courses to time periods and then scheduling students into the courses that they have requested. The school official could use some intuitive method, his previous year's schedule, or some other procedure for assigning courses to time periods. Once courses are assigned to time periods, the problem is to schedule students into the courses that they have requested such that the number of students encountering conflicts is minimized. In this chapter a model is presented, based on network flow theory, which could be used to schedule students into a given class schedule in an optimal fashion.

3.1. Network Flow Model Formulation

To find an optimum solution to the problem described above the problem is partitioned into smaller subproblems. A feasible solution for each small subproblem is found and the sum of all the solutions of all small subproblems constitutes the overall optimum solution. The partitioning considered is one student at a time, namely, the small problem of scheduling a student into the courses that he or she is requesting. For each student, based on the courses that the student is requesting and the time periods at which these courses are scheduled a small network flow problem is constructed. The solution to this network problem, if one exists, would be a feasible schedule for the corresponding student. Those students for which a solution to their corresponding network flow problem does not exist are the ones which could not have a feasible schedule in the given master schedule and, therefore, would encounter a conflict. The total number of conflicts finally would be equal to the total number of infeasible solutions obtained by solving network flow problems for all students. This would be the minimum number of conflicts achievable for the given master schedule. Any improvements in order to reduce the number of conflicts at this point could be achieved by sensitivity analysis.

3.2. Informal Description of the Network Model Formulation

To show how the original problem of scheduling students into a given class schedule is partitioned into smaller subproblems, in the form of network flow problems, an example would be presented first. Let us consider a master schedule consisting of courses 1, 2, ..., 9, and the courses are assigned to time blocks as follows:

	Time Blocks			
	1	2	3	4
Courses	1 5-1 7-1 9-1	2 6-1 8-1	3 5-2 8-2 9-2	4 6-2 7-2 9-3

The first row labeled "time blocks" represents time blocks 1, 2, 3, and 4. The second row indicates that course 1 is scheduled at time period 1, course 2 is scheduled at time period 2 and so on. The third row indicates that course 5, section 1, is scheduled at time period 1; course 5, section 2 is scheduled at time period 3, and so forth.

Suppose a student is requesting courses 2, 5, 8, and 9. To set up a network flow problem for this student let's consider the above table (existing master schedule) in the following form.

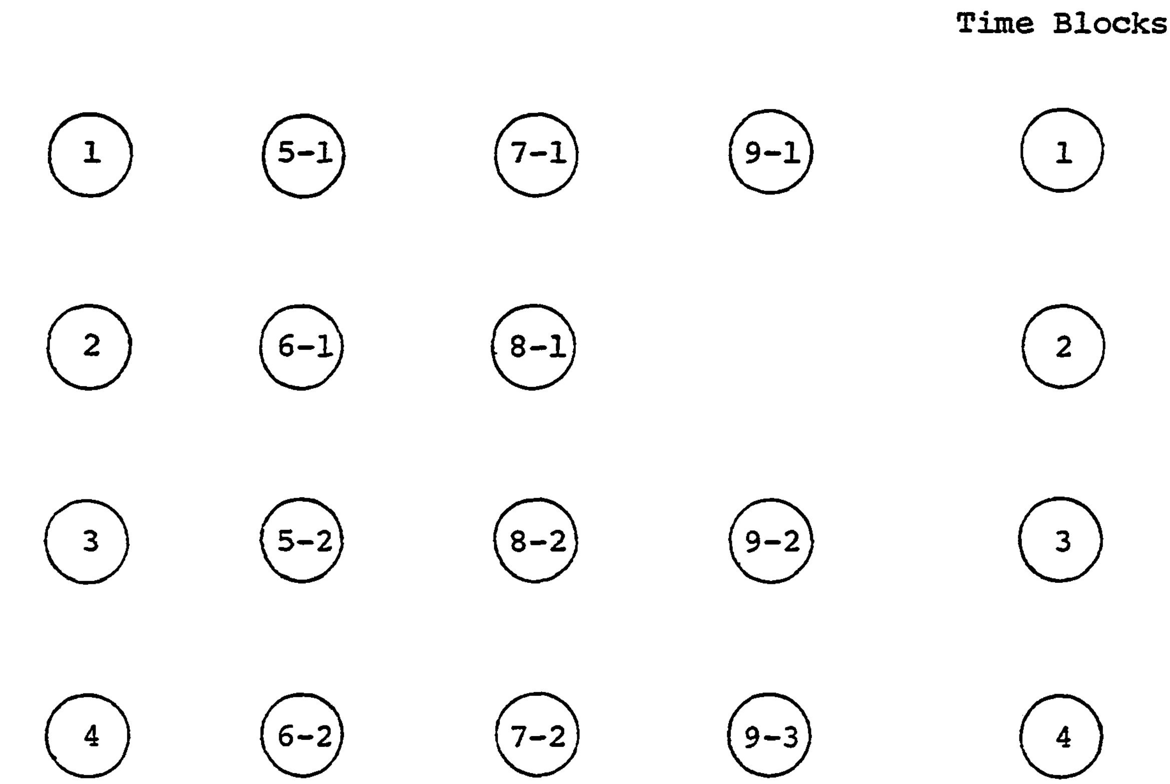

Figure 1.

In this representation a node represents a single section course or a section of a multi-section course and its location represents the time period to which it is assigned. A student would then be represented by a source node s and the arcs carry the flow to some of the nodes according to several restrictions. The restrictions ensure the existence of arcs between node s and the nodes corresponding to the courses that the student has requested and the arc has a lower and upper bound on flow as (0-1). Each arc would then have a label with general form (L, U, C) where L and U are lower and upper bounds on the flow, respectively, and C represents the cost of scheduling the student into a particular section.

To achieve a restriction for each multi-section course a super source would be considered which would receive only one unit of flow and therefore is able to send at most one unit of flow (Figure 2). This one unit can then flow into one of the nodes corresponding to different sections of a course and no flow into other nodes indicates that the student would not be scheduled into other sections of the same course.

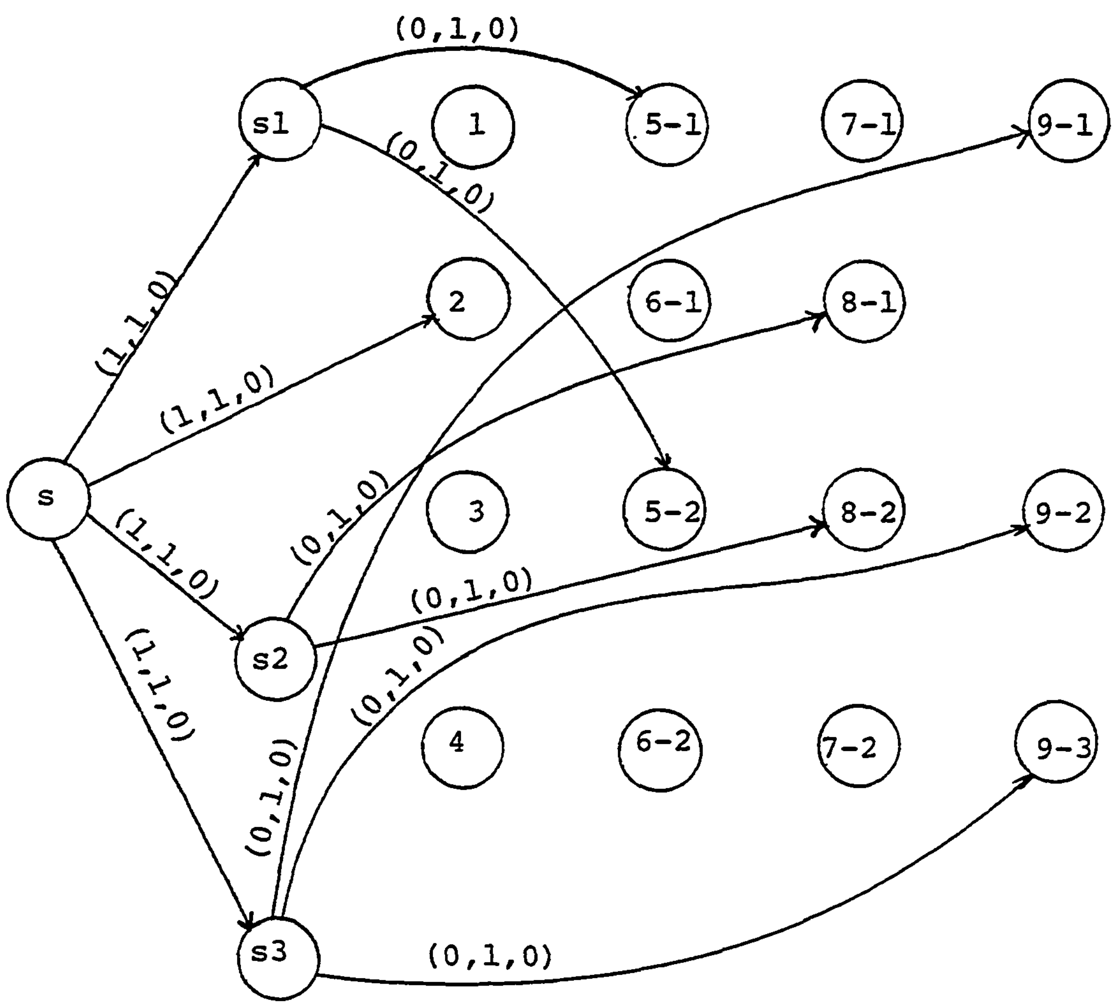

Figure 2.

In this figure node s is the supersource representing the student. Arcs (s,s1), (s,2), (s,s2), and (s,s3) all are of the form (1,1,0). A (1,1,0), for (s,s1) means that one unit of flow must flow from s to s1. S1 represents a super-source for course 5 which is a two-section course and therefore two arcs emanate from s1. Arcs (s1,5-1) and (s1,5-2) are of (0,1,0) type which means that 0 or 1 unit of flow could flow from s1 to either 5-1 or 5-2. Consider courses 5 and 9 and suppose one unit of flow moves from s to 5-1 and another unit of flow moves from s to 9-1 yielding a conflict. To prevent this from happening two nodes (supersinks) are added to the previous diagram (Figure 2) as shown in Figure 3 by nodes t1 and t.

Flows of 0 or 1 unit could flow from 5-1 or 9-1 to t1 but at most one unit could flow from t1 to t.

The same line of reasoning would be applied to other courses and time periods producing the diagram in Figure 3.

The long arc from node t to node s with label (4,4,0) is to make sure that 4 units of flow would move from t to s and puts this network flow problem into a form called a minimum cost circulation problem. The network is constructed in this form because the out-of-kilter algorithm developed by Fulkerson [39] deals with circulations and a circulation is an assignment of flow to arcs such that flow is conserved at each node. Totally there are 17 nodes and 24 arcs which form the network problem. The solution to this network flow

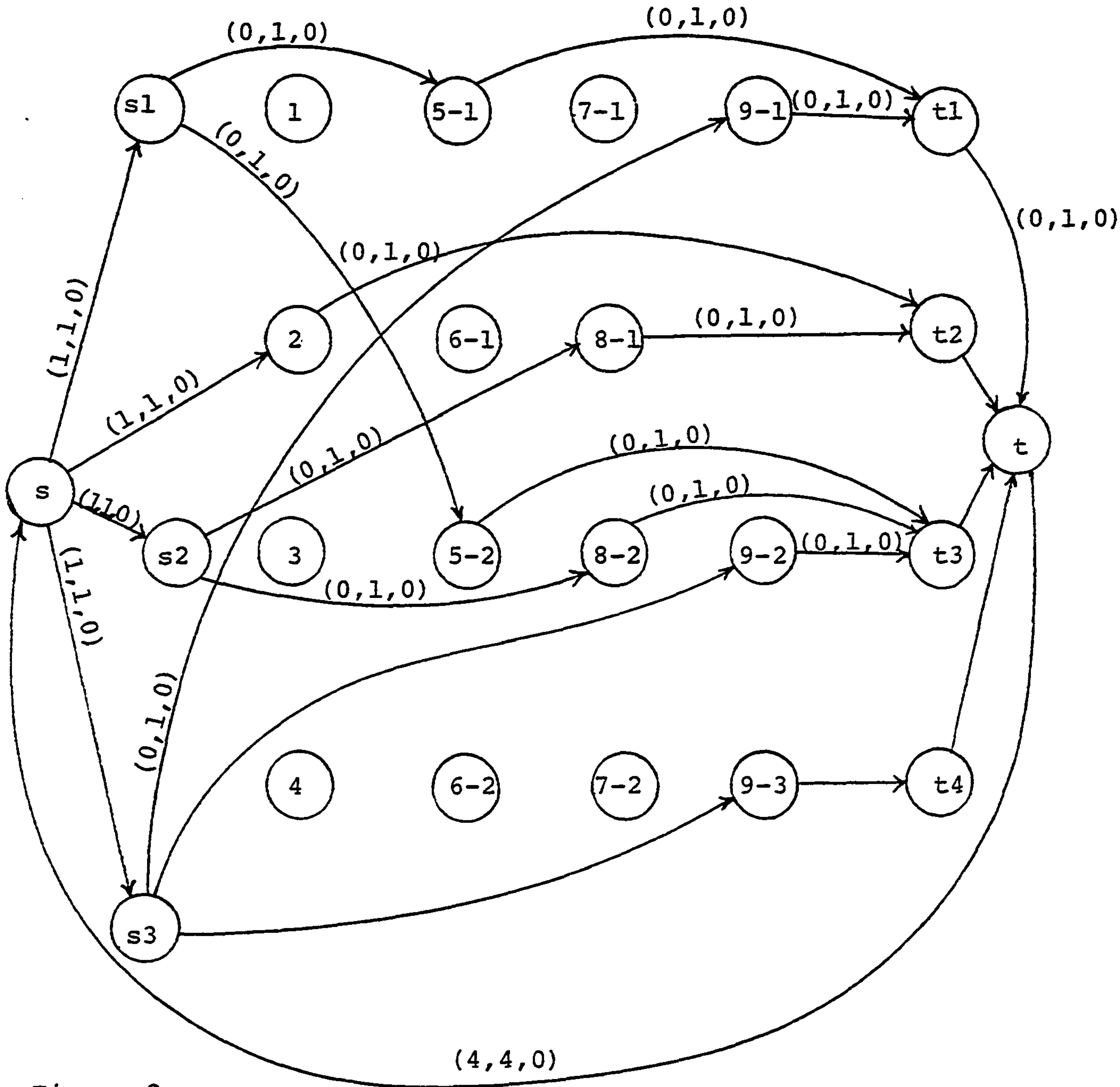

Figure 3.

problem, if one exists, would be a feasible schedule for the corresponding student. Two network flow problems such as above one with 12 nodes and 35 arcs and the other with 16 nodes and 35 arcs were solved using an out-of-kilter algorithm code. The two problems, network set up and solution, required .8 and 1.8 seconds of IBM

370/158 CPU time, respectively. A network flow problem, such as above, could be constructed for each student and then solved. All the feasible solutions represent all those students who could be successfully scheduled. All the infeasible solutions represent all those students for which a feasible schedule does not exist in the given class schedule. The overall solution, whether the objective is maximizing number of student requests satisfied or minimizing number of student conflicts is optimum for the existing class schedule. As to the size of each network flow problem consider the example used previously where a student is requesting six courses, a single-section, a 2-section, a 3-section, a 4-section, a 5-section, and a 6-section course. The network flow problem constructed for this student would have a maximum of 34 nodes and 54 arcs. It is therefore seen that, on the average, network flow problems constructed for students are relatively small both in terms of number of nodes and number of arcs.

At this point the general procedure for constructing a network flow problem for each student based on the assumption that a class schedule exists will be discussed. It is also assumed that time periods are non-overlapping and all the courses require one time period per meeting. Overlapping time periods and courses which require more than one time period per meeting are discussed in a later section.

Suppose a class schedule is given and a student's request list is selected to be considered for scheduling.

Consider each course and each section of a course that the student is requesting as a node in the network context. Assume there is a supersource node s (normally numbered 1) representing the student. This source node is capable of sending flow to other nodes and the amount of flow moving into and out of it must exactly equal the number of courses that the student is requesting. The network flow problem must be set up such that at most one unit of flow moves from the supersource to each course that the student is requesting. If the course is multi-section, then at most one unit of flow must move from the supersource s to all the nodes representing different sections of the course. This will ensure the restriction that the student is scheduled into at most one of the sections of a multi-section course. Units of flow move from a node to another through arcs connecting the two nodes and, therefore, the source node s is connected to all the nodes corresponding to the courses that the student is requesting through capacitated arcs.

The capacitated arcs all are directional and have labels of the form (L,U,C), where L and U are lower and upper bounds on the amount of flow, respectively, and C represents the cost of utilizing the arc. For each single section course an arc is considered from s to a new node representing the course with a label (0,1,0). This means that 0 or 1 unit of flow could move from s to the new node and the cost is 0. For each multi-section course an intermediate supersource is considered. This intermediate supersource is connected to s through an arc with label (1,1,0). This means that at least one (L=1) and at most (U=1) one unit of flow and therefore, exactly one unit of flow must flow from s to the intermediate supersource and the cost of utilizing this arc is 0. New nodes are then considered to represent different sections of the course, one node for each section. The intermediate supersource is connected to each of these new nodes by an arc labeled $(0,1,C_{j_m})$ where C_{j_m} is the number of students already scheduled in section m of course j. Consider the following example:

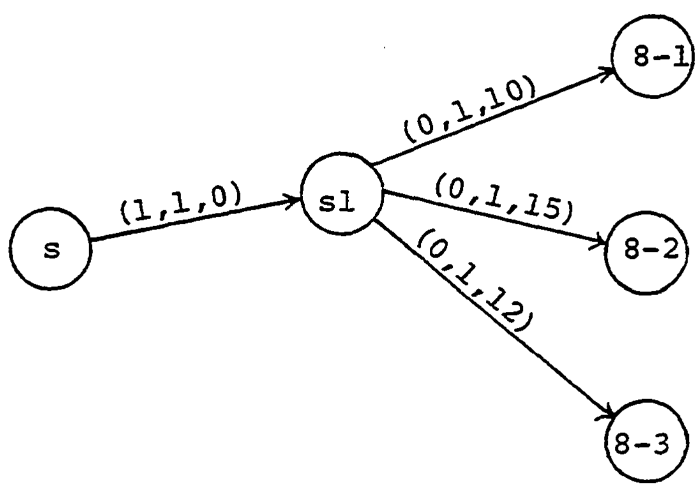

Figure 4.

Suppose course 8 is a three-section course requested by a student and each section has been assigned C_{j_m} students. If the existing class schedule and the courses that the student is requesting are such that one unit could flow from s1 to either 8-1, 8-2, or 8-3, then that unit will flow into the arc with smallest cost and the student will be scheduled into the section with fewest number of students already scheduled in it. This is an attempt to achieve some balance on the number of students scheduled into different sections of a course.

New nodes are also considered for all the time periods at which a course or a section of a course requested by the student are scheduled. Arcs are then constructed from all the nodes corresponding to courses and sections of the courses to their corresponding time period nodes and they are all labeled (0,1,0). For instance, in the previous example suppose course 8 section 1 is scheduled at time period 2, section 2 is scheduled at time period 4 and section 3 is scheduled at time period 5. A supersink node is considered and all the nodes corresponding to time periods are connected to this node in the following manner:

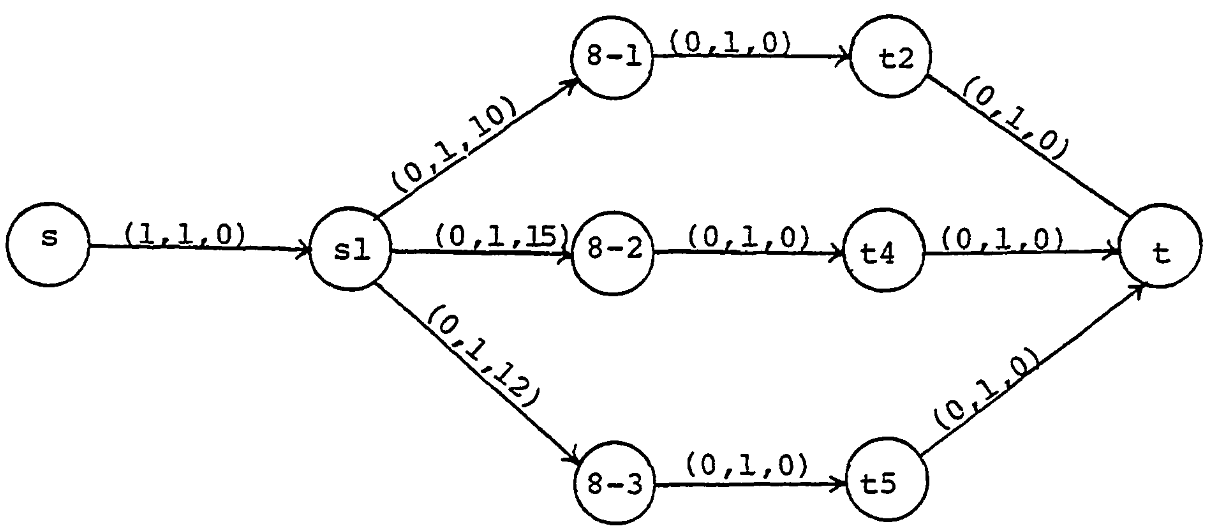

Figure 5.

Suppose this student, along with course 8, is also requesting a single section course, say course 7, scheduled at time period 4 and a double section course 9 scheduled such that section 1 is at time period 1 and section 2 is scheduled at time period 4. The network would be constructed as follows:

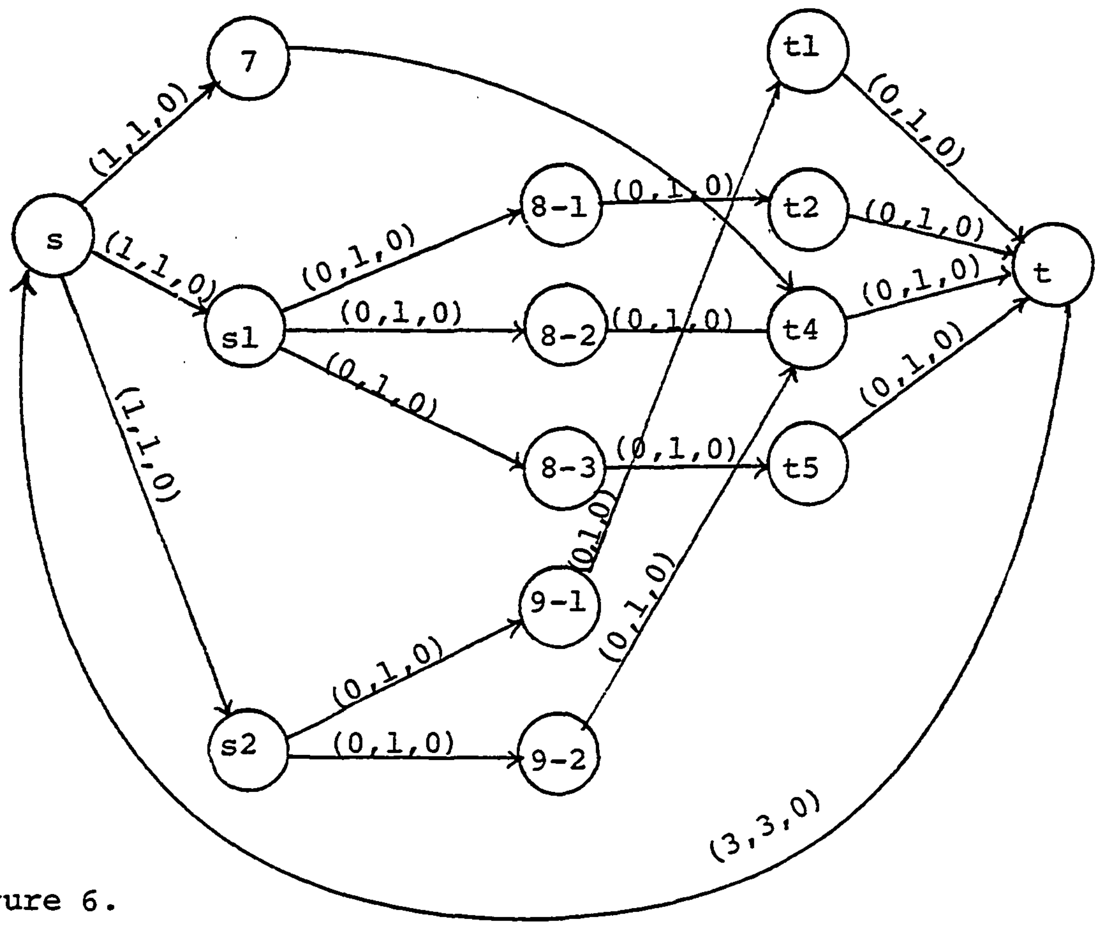

Figure 6.

A return arc labeled (3,3,0) eventually ensures that exactly 3 units of flow (equal to the number of courses requested) moves from s to t if a feasible schedule exists.

3.3. Network Flow Problem Construction

NOS = Set of all students

N = Number of courses requested by a student

j = A course index, j = 1,...,N set of courses requested by a student

C_{j_m} = Number of students already scheduled into section m of course j

S_j = Number of sections of course j

NT = $\sum_{j=1}^{N} S_j$ Total number of sections requested by a student

T(m,j) = Time period at which section m of course j is scheduled

TL(L) = A time period at which a section of a previously considered course requested by student i is scheduled. (Ex. when j = 2, the second course requested by the student is considered, and TL(1) = 3, TL(2) = 5, (TL(L) = 0, L = 3, NT) means that section 1 of the first course requested by the student is scheduled at time period 3 and section 2 of the first course is scheduled at time period 5.)

K = A node index

K_s = A node index for multi-section courses

STEP 1: Select student i ε NOS. If NOS is empty STOP.

STEP 2: Compute number of nodes necessary to represent supersources and all the courses and sections of the courses requested by the student.

(a) Set NN = N and j = 0

(b) Set j = j + 1

If j > N Go to STEP 3

If $S_j \leq 1$ Go to STEP 2-(b)

Otherwise, set NN = NN + S_j, Go to STEP 2-(b)

STEP 3: Set j = 0 (TL(L) = 0, L = 1, NT), t = 0, m = 1

K = 1 (set up the first node; a supersource)

STEP 4: Set j = j + 1

If j > N Go to STEP 7

If $S_j > 1$ Go to STEP 6

STEP 5: Set up node K = K + 1 (to represent the single section course j). Connect node 1 to node k to form arc (1,k) and label the arc (0,1,0).

(a) If there is an L (L = 1,...,NT) for which T(m,j) = TL(L) then a node NN + L has been already set up. Connect node k to node P = NN + L to form arc (k,p) and label the arc (0,1,0), go to STEP 4.

(b) If T(m,j) ≠ TL(L) for L = 1,...,NT set t = t + 1 and TL(t) = T(m,j), then set up node p = NN + t, connect node k to node p to form arc (k,p) and label the arc (0,1,0), go to STEP 4.

STEP 6: Set up node K_s = K + 1 (to represent a supersource for multi-section course j). Connect node 1 to node K_s to form the arc (1,K_s) and label the arc

(1,1,0). Set up nodes $K_s + 1$, $K_s + 2$, ..., $K_s + m$, ..., $K_s + S_j$ (to represent all sections of course j) and connect node K_s to each one of these nodes to form arcs (K_s,K_s+1), (K_s,K_s+2), ..., (K_s,K_s+S_j) and label all these arcs $(0,1,C_{j_m})$, set m = 0.

(a) m = m + 1

If $m > S_j$ go to STEP 4

(b) 1. If there is an L (L = 1,...,NT) for which T(m,j) = TL(L), then a node P = NN + L has already been set up. Connect node $K_s + m$ to node p to form arc (K_s+m,p) and label it $(0,1,C_{j_m})$, go to STEP 6-(a).

2. If $T(m,j) \neq TL(L)$ for L = 1,...,NT, set t = t+1 and TL(t) = T(m,j), then set up node p = NN + t, connect node K_s+m to node p to form arc (K_s+m,p) and label the arc $(0,1,C_{j_m})$, go to STEP 6-(a).

STEP 7: Set up node Q = NN + t + 1 (to represent the last supersink), then connect nodes NN + 1, NN + 2, ..., p to node Q to form arcs (NN + 1, Q), (NN + 2, Q), ..., (P,Q) and label these arcs (0,1,0).

STEP 8: Connect node Q to node 1 to form the reverse arc (Q,1) and label the arc (N,N,0). This completes the formulation of a minimum cost circulation network flow problem for student i. The solution to this problem, if one exists, would show a feasible schedule for the student. Go to STEP 1.

3.4. Model Flexibility in More General Cases

More complex situations could be modeled for more sophisticated class schedules. For example, if the school offers courses of several-hour type or courses with overlapping time periods a network flow problem could still be set up for each student. Limitations on the number of students allowed to be scheduled into a particular section could also be incorporated into the network problem formulation. When there are several-hour courses a node is considered for the course at each time period and a supersource considered for all these nodes. A flow equal to the number of hours that the course requires is forced into the supersource and therefore the student would be forced to be scheduled into all those time periods that the course requires. If there are overlapping time blocks for two courses and a student is requesting both of these courses, then there is no feasible solution for this student.

Suppose there is a limit on the number of students who could be scheduled into a particular section of a course. In this case, schedule students as described originally and if the number of students scheduled into this particular section is more than the limit indicated, reschedule all the students who are requesting this course. This time assign a higher per unit cost to the arc going into the node representing the particular section. If the number of students scheduled into the section is still higher than the limit, the per unit cost could be raised again and students previously scheduled into this course rescheduled until the number of students scheduled into the section is less than or equal to the required limit. If a very high per unit cost for the above-mentioned arc is selected, then only those students would be scheduled into this section for which there is only one feasible schedule. If the number of students scheduled into this section is still higher than the limit, then the difference between number of students scheduled into the section and the indicated limit would show the number of conflicts (students with no feasible schedule) that actually would result if a limiting constraint is imposed.

3.5. Model Application

Suppose a heuristic approach is used in scheduling a school and a class schedule is generated, students are scheduled into classes, and a number of students are indicated as those encountering a conflict. As explained above a number of these conflicts could possibly be resolved by moving students from one section of a multi-section course to another. This means that the class schedule generated by a heuristic approach would not normally produce the best possible result. It is, however, possible to use the model discussed here and an algorithm similar to the one discussed in section 3.3 to find a feasible schedule for some conflicts labeled resolvable. A network flow problem could be set up for each student encountering a conflict based on the courses that the student is requesting and the time periods at which these courses are scheduled. A feasible solution obtained for each network problem would indicate that the corresponding student's conflict could be resolved and a feasible schedule for this student exists. All the feasible solutions would show all the conflicts which could be resolved. All the infeasible solutions would show the total number of irresolvable conflicts. This would be the minimum number of conflicts for the class schedule.

3.6. Computational Methods

Recent computational advances in the development of computer codes to solve network flow problems show that many of these problems could be solved far more effectively than in the past. As Glover and Klingman [36] indicate new computer codes have succeeded in solving even large size problems (several thousand nodes and several thousand arcs) with an efficiency many times beyond codes previously available. The network flow problem considered here, for each student, is of a simple type normally, with less than 50 nodes and 100 arcs. These problems could be easily and efficiently solved using very little central computer memory. Glover and Klingman [38] indicate that new computer codes for solving network problems are extremely efficient and, as an example, a network problem with 1000 nodes (equations) and 7000 arcs (variables) can be solved in 8 seconds on an

IBM 360/65 using the highly efficient network code [40]. As indicated earlier two network flow problems, of the type discussed here, were solved using an out-of-kilter algorithm code. The problems one with 12 nodes and 35 arcs and the other with 16 nodes and 35 arcs required .8 and 1.8 seconds of the IBM 370/158 CPU time, respectively. Some of the references in this area are Barr et al. [41], Clasen [42], and Edmonds and Karp [43].

3.7. Summary

In this chapter a network flow model was developed for scheduling students into an existing class schedule in an optimal fashion. Existing solution procedures for the type of network flow problems developed and other applications of the model were discussed.

CHAPTER IV

A HEURISTIC APPROACH FOR CLASS-SCHEDULING IN TRADITIONAL SCHOOLS

As indicated earlier, general purpose scheduling programs have been developed which are very flexible and can be used to perform scheduling for a wide range of schools. To obtain more flexibility, scheduling programs have been developed which utilize what is called "modular scheduling." Modular scheduling is the case where the basic time unit considered is small and any class period could be composed of one or more of these basic units. This type of scheduling offers a great amount of flexibility which then allows the school program to incorporate all sorts of flexible schedules, programs, and new ideas. On the other hand, modular scheduling requires a great amount of information regarding students' course requests, course requirements, teacher requirements, preferences, classroom requirements, etc. This obviously indicates that very flexible scheduling requires a long planning period for data collection, a huge computer program to consider all types of situations and restrictions, technical assistance for data setup and computer runs, and could become uneconomical in terms of personnel time, computer time, and computer memory requirements.

Since most schools follow a traditional or conventional scheduling system with little flexibility, a relatively small and simple to implement computer program for their class-scheduling could provide them with efficiency and economy. Conventional schools are characterized by a school structure where the cycle is one day, all the courses meet for one period during the day, and courses could offer more than one section. A modified school structure is very similar to a conventional school structure except that some of the courses offered would meet daily for more than one hour.

A heuristic approach and a computer program is developed intended to be used by schools with a modified structure or a traditional structure.

Heuristic and mathematical optimization techniques are incorporated in this program to generate class schedules with relatively few student conflicts, be fast as far as CPU time is concerned, and be small in terms of memory requirements.

4.1. General Problem Description

The approach is basically designed for small to medium size schools (300-800 students), although it could be used for large size schools as well.

Schools with a modified structure and as a special case of this structure, schools with a traditional structure, would be considered in the approach and program development. This provides some flexibility in the sense that a large number of schools could use the program. In the above structures a school day is divided into six time periods of an hour each. If a class-schedule is constructed, it would remain the same every day of the week. Students, on the average, request six courses per semester.

There are two semesters in a school year. Course offerings are such that some courses are offered only in the first semester, some only in the second semester, and other courses which start in the first semester and continue through the second semester. These types of courses are called first-semester, second-semester, and all-year courses, respectively. In each category there are courses which offer only one section, and courses which offer more than one section. Most of these courses are only one hour long, but there are some courses, called several-hour courses, which require time periods longer than one hour. The latter type courses normally could require successive time periods of up to four hours long and are such that a group of students and one or more classrooms are assigned to a group of teachers for several hours. The teachers then plan and perform whatever program they are interested in. There are some courses which must be scheduled at specific time periods. These courses are called locked-in courses. Still, there are other types of courses where a group of them must be scheduled at different time periods because of lack of enough teachers or rooms.

4.1.1. Basic Assumptions

The basic assumptions, based on which the heuristic approach will be developed, apply to the type of problem discussed above and are as follows:

A limited set of time periods (non-overlapping) are given. A number of courses are to be scheduled at these time periods such that a set of constraints are satisfied and the number of students encountering a conflict is minimum. Any number of courses could be scheduled at a given time period. A course or a section of a course must be scheduled at one and only one time period except for several-hour courses which must be assigned to several successive time periods. A student can take one and only one course (or a section of a course) at a time period. If two courses are scheduled at a time period some conflicts could encounter and the number of conflicts is equal to the number of students requesting both courses. A set of courses taught by a single teacher or a group of courses utilizing a certain room, must be scheduled at different time periods.

4.1.2. Heuristics

School officials who have been doing scheduling manually for several years know that, in general, some courses or some students are harder to schedule than other courses or other students. This knowledge, based on their past experience, gives them the ability to recognize those courses which are hard to schedule and those students who are hard to schedule. Accordingly, they would schedule those courses or students at the beginning of their scheduling process as a rule. There are several heuristics that could advantageously be used in developing a scheduling program, some of which are as follows:

(a) Generally speaking, single-section courses are harder to schedule than multi-section courses.

(b) In order to make the choice as wide as possible, different sections of a course should be scheduled at different time periods.

(c) The more single-section courses a student is requesting the harder it is to schedule him.

(d) The more crowded courses should be scheduled before the less crowded courses.

(e) Two courses offered in different semesters but both requested by many students should be scheduled at the same time.

4.2. The Heuristic Solution Approach

The solution procedure for the above scheduling problem involves dividing the original problem into several subproblems according to the type (locked-in, single-section, multi-section, etc.) of courses which are being considered for scheduling.

The subproblems are considered for scheduling in a successive manner and the interaction between them is the order in which they are considered. The order in which a subproblem is considered for scheduling is based on the relative scheduling difficulty of courses comprising the subproblem. Although determining which types of courses are more difficult to schedule than other types is somewhat subjective, a good heuristic is that the more restricted courses are harder to schedule than less restricted courses.

This heuristic is used to identify subproblems representing course types and arranging them in the following manner: Locked-in, Several-hour, Teacher or room restricted single-section, Unrestricted single-section, and Multi-section courses. Locked-in courses are normally single section and restricted to a single time period and therefore, involve no decisions.

Each subproblem is further partitioned into smaller subproblems of one or more courses to be considered for scheduling at a time. The interaction between new subproblems is again determined by the order in which they are considered for scheduling. The order is determined by assigning a number, called an index of difficulty, to each course which represents its relative scheduling difficulty with respect to other courses. The index of difficulty is assigned based on one or more heuristics and is computed for different course types differently. The solution approach originally is designed to arrange the courses according to the five general types and according to descending order of index of difficulty within each type. The scheduling process starts by scheduling locked-in courses one by one first. Then, other course types are scheduled successively using algorithms developed based on heuristics or mathematical optimization techniques or a combination of both.

The only course type where the developed algorithm considers more than one course for scheduling at a time is the teacher or room restricted single-section courses.

In addition to the use of heuristics and mathematical optimization techniques, the special structure of the problem has been used advantageously, whenever possible, to reduce computer time and memory requirements. Finally, the program developed for the implementation of the solution approach is developed in several components such that each component could be processed to schedule a portion of the overall problem independently. The advantages are that:

(a) Instead of one huge program several small programs are processed successively so that memory requirements are kept down.

(b) If after scheduling a portion of the courses the resulting schedule is not satisfactory changes could be made before all other courses are scheduled.

(c) If an error is detected at a stage only the component corresponding to that stage would have to be processed again.

A conflict matrix is computed for all locked-in, several-hour, and single-section courses. As an example consider:

	Courses		
Courses	529	550	571
529	0	6	0
550		0	12
571			0

The first row indicates that if courses 529 and 550 are scheduled at the same time 6 students would encounter conflicts and if courses 529 and 571 are scheduled at the same time no conflicts would result.

The next sections discuss computation of index of difficulty, heuristic or mathematical techniques utilized, and the algorithm used for scheduling of each type of course.

4.2.1. Treatment of Locked-In Courses

These courses are supposed to be scheduled at a specific predetermined time period. Arrays are used to store relevant information to be used when other courses are scheduled later.

4.2.2. Scheduling Several-Hour Courses

These courses require several successive time periods and are originally ordered such that the lengthier courses would be considered for scheduling first. For example, courses which require four-hour time blocks are considered for scheduling before courses which require three-hour time blocks and so on. Since these courses would be arranged based on the number of time periods that they require, they are arbitrarily assigned an index of difficulty of zero. These courses could be time restricted. For example, a four-hour course could be restricted to morning time periods of 1, 2, 3, and 4.

To explain the heuristic algorithm used for scheduling several-hour courses an example is given. Consider a three-hour course 571 which has no time restrictions and all the locked-in courses are already scheduled as follows:

Time Period	1	2	3	4	5	6
Course	5	23	538	540	360	529

Course 571 would temporarily be scheduled at time periods 1, 2, 3 such that:

Time Period	1	2	3	4	5	6
Course	5	23	538	540	360	529
	571	571	571			

And total number of conflicts between 571 and other courses is computed. The total number of conflicts between 571 and all other courses is computed by identifying (from stored information in arrays) all the courses which are already scheduled at time periods 1, 2, and 3 and summing up the number of conflicts between each one of these courses and 571. Course 571 would temporarily be scheduled again at time periods 2, 3, 4 and again total number of conflicts computed.

The above procedure would be repeated for course 571 for time periods 3, 4, 5 and 4, 5, 6. Finally, course 571 is scheduled permanently at those set of successive time periods for which the penalty is a minimum.

4.2.3. Scheduling Single-Section Teacher or Room Restricted Courses

These courses are arranged such that all the courses (single-section) restricted by a teacher or a room are in one group and the order of the courses within a group is not important. The groups of restricted single-section courses are arranged such that a group of six courses are before a group of five courses which are in turn before a group of four courses and so forth. This arrangement represents the relative scheduling difficulty of different groups and implies that it is more difficult to schedule a group of six restricted courses than it is to schedule a group of five restricted courses and so on.

If there are sets of restricted courses such that some of the courses are single-section and some others are multi-section, only single-section courses of each set would be considered as a group in this category. The multi-section restricted courses would be considered later when multi-section courses are considered for scheduling. To explain the method used for scheduling restricted single-section courses let us consider the following example:

Suppose all the locked-in and several-hour courses are already scheduled as shown in the following table:

Time Period	1	2	3	4	5	6
Course	5	23	538	540	360	529
	571	571	571			
				573	573	573

Suppose courses 9, 10, 11, and 12 are a group of teacher-restricted single-section courses which must be scheduled at different time periods. Consider the conflict matrix C_{jk} computed below.

Time Periods		1	2	3	4	5	6
Courses	9	2	1	4	3	0	5
	10	3	1	6	2	1	0
	11	1	3	8	4	6	2
	12	5	1	3	7	2	3

Entries represent number of conflicts for scheduling a particular course at a particular time period considering all other courses which are already scheduled. The first row, for example, indicates that if course 9 is scheduled at time period 1, the number of students who would encounter a conflict is 2 (the two conflicts would result because of students requesting courses 9, 5 or 9, 571 or 9, 5, 571).

The entries in the first row also indicate that if course 9 is scheduled at time periods 2, 3, 4, 5, or 6 the number of potential conflicts would be 1, 4, 3, 0, or 5, respectively. Total number of potential conflicts for a course x if scheduled at a time period t is computed such that C_{xt} is the sum of the number of conflicts between x and all other courses already scheduled at time period t which are all-year courses or are offered in the same semester as x is, minus sum of all the conflicts between x and all other courses scheduled at time period t which are offered in a different semester than x is.

A network flow problem is then constructed as follows:

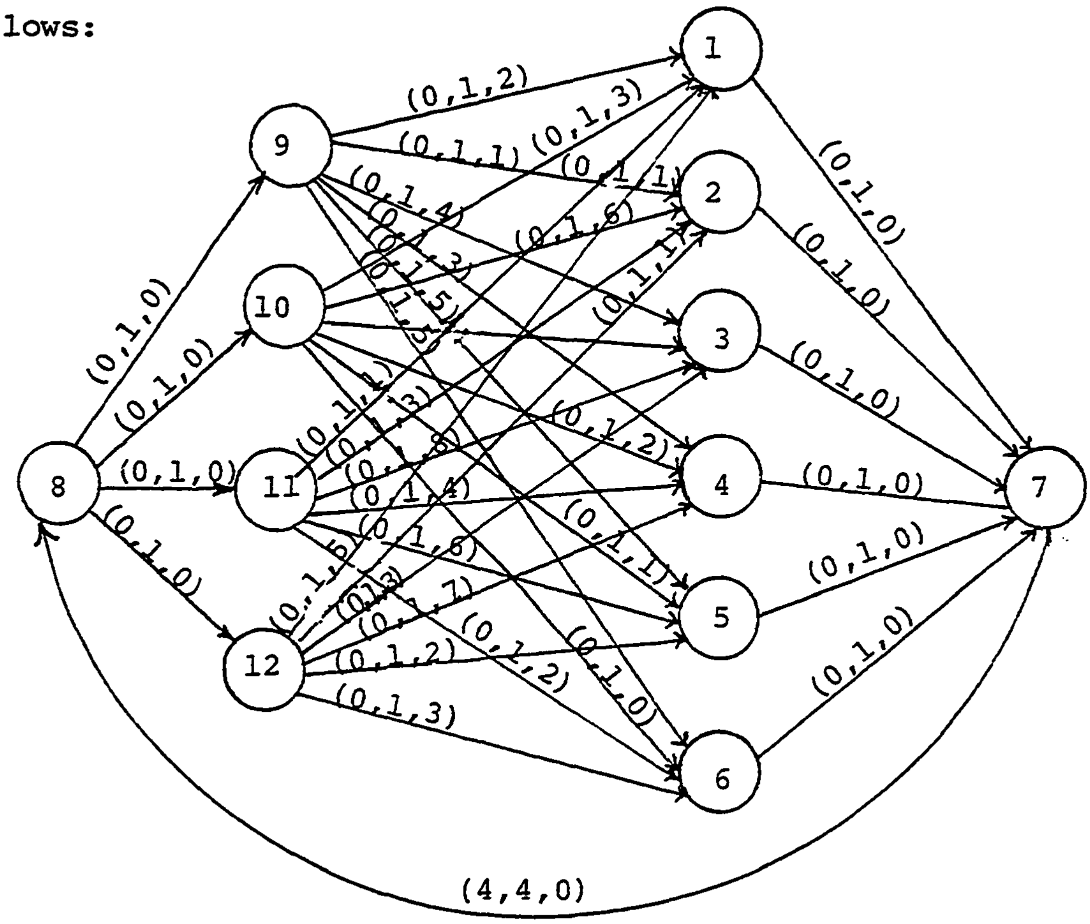

Figure 7.

Nodes 1, 2, 3, 4, 5, and 6 represent time blocks; nodes 9, 10, 11, and 12 represent courses. Arcs from a certain course node to a certain time node indicate that the certain course could be scheduled at the corresponding time block and the label $(0,1,C_{jk})$ indicates that zero or one unit of flow could move from the course node to the time node and C_{jk} is the cost of per unit flow. For example, node 9 represents course 9 which can send 0 or 1 unit of flow to node 1 which represents time period 1 and the cost of sending a unit of flow C_{jk} would be equal to 2, the number of conflicts which would result if course 9 is scheduled at time period 1. Node 8 is a supersource and node 7 is a supersink. The arc (7-8) has a label (4,4,0) which indicates that exactly four units of flow must flow from node 8 to all course nodes 9, 10, 11, and 12 (one unit of flow to each node) and then to four of the time nodes 1, 2, 3, 4, 5, and 6 and finally to 7. This is the general form of a network flow minimum cost circulation problem. The solution to this problem, using an efficient algorithm such as Out-of-Kilter algorithm by Fulkerson [39], would determine the flow of the four units from course nodes 9, 10, 11, and 12 to time nodes 1, 2, 3, 4, 5, and 6 that minimizes the total cost. The solution to the above network problem using a computer code for Out-of-Kilter algorithm indicates that the minimum cost corresponds to the case where one unit flows from node 9 to node 5, another unit flows from node 10 to node 6, a third unit flows from node 11 to node 1, and a fourth unit flows from node 12 to node 2 for a total cost of 2 conflicts. This means that courses 9, 10, 11, and 12 must be scheduled at time periods 5, 6, 1, 2 respectively to generate an optimum schedule for this course group with respect to all the courses already scheduled, and with a minimum of 2 conflicts.

Finally, the above network flow problem is equivalent to the following assignment problem.

$$\text{Min} \sum_{j=9}^{12} \sum_{k=1}^{6} C_{jk} x_{jk}$$

$$\text{S.T.} \sum_{j=9}^{12} x_{jk} \leq 1 \quad k = 1,\ldots,6$$ at most one course could be scheduled at a time period

$$\sum_{k=1}^{6} x_{jk} = 1 \quad j = 9,10,11,12$$ course j must be scheduled at a time period k

$$x_{jk} = 0 \text{ or } 1 \quad j = 9,10,11,12 \quad k = 1,\ldots,6$$

where C_{jk} is the potential cost of scheduling course j at time period k considering all the courses already scheduled at time period k.

4.2.4. Scheduling Single-Section Unrestricted Courses (No Teacher or Room Restrictions)

Single-section courses are considered for scheduling one by one according to descending order of their index of difficulty. The index of difficulty for this type of course is computed as follows:

Let S represent all the students requesting a single-section course J. Suppose a student $s \in S$ is requesting N courses and $C_s(K)$, $k = 1,\ldots,N$ represent the set of courses that the student is requesting.

For student s an index of difficulty IDFS(s) is computed as follows:

IDFS(s) = 0

for K = 1,N

If $C_s(K)$ is a locked-in, several-hour, or single-section restricted course, then IDFS(s) = IDFS(s) + 3

If $C_s(K)$ is another single-section course not restricted by teachers or rooms, then IDFS(s) = IDFS(s) + 2

If $C_s(K)$ is a two-section course, then IDFS(s) = IDFS(s) + 1

If $C_s(K)$ offers more than two sections, then IDFS(s) = IDFS(s) + 0

The course index of difficulty is now computed as:

$$IDF(J) = \sum_{s=1}^{S} IDFS(s) + a + b*TR$$

where a is an arbitrary large number which keeps the index of difficulty for single-section courses higher than all the multi-section courses.

b is a constant considered for time restrictions, and TR is the number of time period restrictions.

For example, a course which is restricted to morning time periods of 1, 2, 3, and 4 should not be scheduled at time periods 5 or 6 and therefore has a time restriction coefficient of TR = 2.

To schedule single-section courses, the course with the highest index of difficulty would be considered first.

The course considered for scheduling would be temporarily scheduled at time period 1, then 2, then 3, and so on. At each time period, the number of potential conflicts between this course and all other courses already scheduled at this time period would be computed. The time period with minimum number of potential conflicts would be selected. The course presently being considered would be scheduled at this time period permanently. In the case of a tie that time period would be selected at which there are fewest number of courses already scheduled.

4.2.5. Scheduling Multi-Section Courses (2 to 5 Sections)

Multi-section courses are types of courses which offer more than one section. In this section only multi-section courses which offer less than six sections (number of periods) are considered. Courses which offer six sections or more will be considered in the next section. The index of difficulty for these types of courses is computed based on such factors as number of sections, course restrictions, time restrictions, alternative choices, and number of students requesting a course. Course restriction means that a multi-section course presently being considered for scheduling is restricted by another course already scheduled, and different sections of the present course must not be scheduled at the same time as that of the course already scheduled. For example, suppose courses 560, 561, and 562 are all physics courses such that course 560 is a single-section course, 561 and 562 are two-section courses and there is only one physics teacher available. Since course 560 is a single section course, it would be scheduled when single-section courses are considered for scheduling prior to multi-section scheduling process. Then, course 561 is restricted by course 560 and course 562 is restricted by 560 and 561 (both sections).

In the above example if everything is assumed as it is except that course 562 is a three-section course then the three sections must be scheduled at those three time periods where courses 560 and 561 are not scheduled. A three section course such as 562 should then have a higher index of difficulty than those three-section courses which have more than one alternative scheduling choice. It should also be mentioned here that since course 562 is restricted by 561 it must be scheduled after course 561 is scheduled and therefore course 561 must have an index of difficulty higher than 562.

Considering the above discussion, the index of difficulty for a multi-section course J is computed as follows:

Suppose K = total number of available time periods

ITST(J) = total number of students requesting course J

L1 = number of time periods at which course J could be scheduled

MSEC(J) = number of sections offered by course J

K11 = L1 - MSEC(J)

$$TR = \text{Time Restrictions} = \begin{cases} 0, & \text{if there are no time restrictions} \\ K\text{-}L1 & \text{if there are time restrictions} \end{cases}$$

$$CR = \text{Course Restriction} = \begin{cases} \text{Sum of number of sections of a set of courses } C(J)\text{; if course } J \text{ is restricted by } C(J) \\ 0\text{, otherwise} \end{cases}$$

Then, the index of difficulty for course J is:

$$IDF(J) = \begin{cases} c+ITST(J) + d*TR + e*CR - f*MSEC(J) \text{ if } K11 > 0 \\ c+ITST(J) + d*TR + e*CR - f*MSEC(J) + g \text{ if } K11 = 0 \end{cases}$$

where c, d, e, f, and g are constants. The constant c is a large number which is added to index of difficulty of all those courses which offer more than one section but less than six sections. The value of c is selected such that the index of difficulty of all courses offering two to five sections would be higher than the index of difficulty for all the courses offering more than five sections but less than the index of difficulty for single-section courses. In summary, c is selected such that

indices of difficulty for courses offering more than 5 sections	<	indices of difficulty for courses offering 2-5 sections	<	indices of difficulty for single-section courses

d, e, and f are all arbitrary constants representing scheduling difficulty of a multi-section course with respect to time restrictions, course restrictions, and the number of sections offered by the course, respectively. Finally, g is an arbitrary constant representing scheduling difficulty when there is only one alternative scheduling choice available.

To explain the algorithm for scheduling multi-section courses an example is presented. Suppose a class schedule is being prepared for a school and all the locked-in, several-hour, single-section teacher or room restricted, and single-section unrestricted courses are already scheduled as follows:

Time Periods	1	2	3	4	5	6
Courses						
Locked-in	5	23	538	540	360	529
Several-hour	571	571	571			
				573	573	573
Teacher or room restricted single-section	11	12			9	10
Unrestricted single-section	320		560	118		559

Course 320 is a second-semester course and all other courses are either first-semester or all-year courses.

Suppose now that the two-section course 61 is being considered for scheduling and this course is (a) restricted by course 560 (course restriction) and (b) must not be scheduled at time period 6 because of teacher unavailability (time restriction), and (c) it is a first-semester course.

Using restriction information course 560 could be located and noticed that course 61 cannot be scheduled at time period 3 (because of course 560) and time period 6. Since course 560 is already scheduled at time period 3, course 61 could be scheduled at time periods 1, 2, 4, and 5. Several alternative scheduling choices are available:

1. Schedule course 61 section 1 at time period 1 and section 2 at time period 2.
2. Schedule course 61 section 1 at time period 1 and section 2 at time period 4.
3. Schedule course 61 section 1 at time period 1 and section 2 at time period 5.
4. Schedule course 61 section 1 at time period 2 and section 2 at time period 4.
5. Schedule course 61 section 1 at time period 2 and section 2 at time period 5.
6. Schedule course 61 section 1 at time period 4 and section 2 at time period 5.

Total number of alternatives available = $C_2^4 = \frac{4!}{2!2!} = 6$

(For a three-section course and 6 time periods the number of alternative choices would be $C_3^6 = \frac{6!}{3!3!} = 20$.)

To select one of the alternative choices two heuristics are considered.

1. First heuristic is used to avoid generating conflicts and is stated as: schedule different sections of the course at that alternative choice which generates the minimum number of conflicts considering all the courses already scheduled.
2. The second heuristic is used to avoid generating conflicts in the future when other multi-section courses are scheduled and is stated as: schedule a first-semester

course at the same time as a second-semester course and vice versa, if a group of students have requested both courses.

As an example of the latter heuristic, suppose a student has requested courses 5, 23, 306, 324, 538, 540, 360, and 529. Suppose further that courses 5 and 23 are first-semester courses, 306 and 324 are second-semester courses and 538, 540, 360, and 529 are all-year courses. Considering that there are six time periods, the student could have a feasible schedule if the courses are scheduled in an arrangement such as follows:

Time Periods	t_1	t_2	t_3	t_4	t_5	t_6
Courses	5	23	538	540	360	529
	306	324				

The student would not encounter a conflict because although scheduled at the same time courses 5 and 306 are offered during two different semesters. The same argument is true for courses 23 and 324. Another arrangement in which the student could have a feasible schedule is:

t_1	t_2	t_3	t_4	t_5	t_6
5	23	538	540	360	529
324	306				

But, if courses 5, 23 and 306, 324 are scheduled at more than two time periods, if not now, the student will encounter a conflict later when eventually all these courses are considered for scheduling.

The problem of finding the best alternative choice for a multi-section course J with respect to all the courses already scheduled could be formulated as an integer programming problem as follows:

$$\text{Max} \sum_{i,s,k} x(i,s,k)$$

$$\text{S.T.} \sum_{k} y(s,k) = 1 \qquad s = 1,\ldots,S_j$$

$$x(i,s,k) \leq y(s,k) \qquad i = 1,\ldots,I;\; s = 1,\ldots,S_j;\; k = 1,\ldots,N$$

$$\sum_{s \varepsilon S_j} x(i,s,k) \leq 1 \qquad i = 1,\ldots,I;\; k = 1,\ldots,N$$

$$\sum_{i \varepsilon P_k} \sum_{s \varepsilon S_j} x(i,s,k) = 0 \qquad k = 1,\ldots,N$$

where:

$$x(i,s,k) = \begin{cases} 1 & \text{if student } i \text{ is scheduled into section } s \text{ at time period } k \\ 0 & \text{otherwise} \end{cases}$$

$$y(s,k) = \begin{cases} 1 & \text{if section } s \text{ is scheduled at time period } k \\ 0 & \text{otherwise} \end{cases}$$

I is the set of students requesting course J

S_j is the number of sections offered by course J

P_k is the set of students who cannot be scheduled at time period k (without encountering a conflict).

In this formulation, the objective function maximizes the number of students successfully scheduled into different sections of the course presently being scheduled. The first constraint insures that a section s is scheduled at one and only one time period. The second constraint states that student i could be scheduled into section s at time period k if section s is scheduled at time period k. The third constraint insures that student i is scheduled into at most one of the sections of the course presently being considered for scheduling. The fourth constraint forces $x(i,s,k)$'s to zero for those students who cannot have a feasible schedule at time period k considering all other courses already scheduled at k.

This model does not easily lend itself to a simple solution procedure and can still be a large size problem if a multi-section course is requested by many students. As an example if a 5-section course is requested by 200 students and the sections could be scheduled to any of the 6 time periods then the number of $x(i,s,k)$ variables would be $200 \times 5 \times 6 = 6000$ and the number of $y(s,k)$ variables would be $5 \times 6 = 30$. Total number of constraints would be 7211.

A different heuristic procedure is employed here for scheduling multi-section courses which is extremely efficient and produces the best solution (or one as good as the solution which could be obtained by utilizing the above model) for a multi-section course presently being scheduled with respect to all other courses previously scheduled. To show how this procedure works let us consider the previous example where a set of courses are already scheduled and course 61, a first semester two-section course, could be scheduled such that different sections may be assigned to time periods 1, 2, 4, and 5. Suppose further that the identification numbers for 18 students requesting course 61 are given as:

1014	1030	1075	1091	1094	1112	1148	1156	1160
1169	1174	1206	1240	1257	1279	1282	1286	1288

All these students have requested other courses, some of which are already scheduled, and some other ones which will be scheduled after course 61 is scheduled. If any of these students has requested a course which is already scheduled at time period k, then the student cannot be successfully scheduled at period k and if a section of course 61 is scheduled at time period k the student cannot be successfully scheduled into this section. Based on this concept a list is determined of all the students who could successfully be scheduled at each time period 1, 2, 4, and 5 as follows:

Time Period	Student ID							
1	1014	1030	1075	1112	1160	1169	1240	1257
	1279	1282	1288					
2	1112	1257						
4	1030	1075	1112	1148	1156	1169	1174	1206
	1279	1282	1286	1288				
5	1030	1075	1112	1148	1156	1169	1174	1279
	1282	1288						

The above list simply indicates that, as an example, students whose ID's are 1014, 1030, 1075, ... could successfully be scheduled at time period 1, but students whose ID's are 1094, 1148, 1156, ... cannot be successfully scheduled at this time period because these ID's are not included in the list for time period 1.

Since 18 students have requested course 61, a desired situation would be that approximately 9 students be scheduled into each of the two sections of the course, if possible. It is seen from the above lists that at time period 2 a maximum of 2 students could successfully be scheduled. This means that if one of the sections is scheduled at time period 2 and the other section at one of the time periods 1, 4, or 5, a balance between the two sections is almost impossible and it is highly likely that many students would encounter a conflict. Therefore, it could very well be advantageous to disregard time period 2 from further considerations and only investigate time periods 1, 4, and 5 for determining the best alternative choice. The selection of the best alternative choice at this point is simply determining, from the ID lists given above, the combination of time periods (1,4), (1,5), or (4,5) which would produce minimum number of students who would encounter a conflict.

Since course 61 is a first-semester course, if the sections are scheduled such that they are at the same time periods as a second-semester course (or sections of a second-semester course), most of the students requesting both courses could be scheduled at the same time into both courses and possibly avoid many future conflicts. For this reason, the number of students requesting course 61 and all the second-semester courses already scheduled at each of the alternative choices (1,4), (1,5), and (4,5) are subtracted from the number of conflicts which is computed at the corresponding alternative choice and then the minimum selected. For example, if course 320 is the only second-semester course already scheduled at time period 1 and there are three students requesting both courses 320 and 61 these three students scheduled into a section of 61 at time period 1 could be prevented from encountering a conflict in the future.

Assume a situation for course 61 and alternative choices (1,4), (1,5), and (4,5) with respect to all the courses which are already scheduled such that for course 61 if:

1. Section 1 is scheduled at time 1 and section 2 at time 4 number of conflicts would be 5.
2. Section 1 is scheduled at time 1 and section 2 at time 5 number of conflicts would be 6.
3. Section 1 is scheduled at time 4 and section 2 at time 5 number of conflicts would be 3.

It is seen that the minimum number of conflicts would be for the case where section 1 is scheduled at time period 4 and section 2 at time period 5 and, therefore, the third alternative choice seems to be the best at this point. But considering the fact that three students are requesting both courses 61 and 320 they would encounter a conflict, if a section of 61 is not scheduled at time period 1, now or later when some of their other courses are scheduled. By scheduling section 1 at time 1 (where the three students could successfully be scheduled into both courses) and section 2 at time 4 the number of conflicts could be computed as:

Number of conflicts = Number of conflicts which would encounter considering all other courses already scheduled - Number of potential conflict reduction in the future = 5 - 3 = 2

And, therefore, alternative choice (1,4) is the best choice.

Now, assuming the selection is alternative choice (1,4) for permanently scheduling the two sections of course 61 the new problem is to schedule the students into the different sections such that potential future conflicts are prevented and, also, there is a balance between the two sections of the course. For our example suppose section 1 is permanently scheduled at time period 1 and section 2 at time period 4. The first student requesting course 61 is the student whose ID is 1014. If this student is requesting a second-semester course which is already scheduled at time period 1, the student would be scheduled into section 1 (at time period 1). If this student is requesting a second-semester course which is already scheduled at time period 4, the student would be scheduled into section 2 (at time period 4). If this student is not requesting a second-semester course already scheduled at either time periods 1 or 4, then he would be scheduled into that section (1 or 2 of 61) which has the fewest number of students already scheduled in it (assuming he could successfully be scheduled into both time periods). This is an attempt to develop a balance between the two sections. If this student could be successfully scheduled into one of the time periods, then he would be scheduled into the section corresponding to that time period. Finally, if the student cannot be successfully scheduled into either of the two time periods, the student is encountering a conflict.

The above procedure is repeated for all the students requesting course 61, one by one, until all the students are either successfully scheduled into a section or identified as encountering a conflict.

The scheduling of all multi-section courses (2 to 5 sections) is the same as explained here for course 61 and is performed for all courses successively according to the descending order of their indices of difficulty.

4.2.6. Scheduling Multi-Section Courses (6 Sections or More)

These are types of courses which offer 6 sections or more. Since there are totally 6 time periods available, it is best to schedule at least one section at each time period, if possible, to prevent conflicts. Then, schedule additional sections at those time periods where many students could successfully be scheduled such that eventually there is some balance between the sections and some balance between the time periods. Once it is decided how many sections would be scheduled at each time period, then the scheduling of students into these sections is the same as student scheduling in the previous section (4.2.5).

To show how scheduling is done for those courses which offer 6 sections and more, let us consider the following example. Suppose a class schedule is being prepared for a school and all the locked-in, several-hour, single-section and multi-section (less than 6 sections) are already scheduled as follows:

Time Periods	1	2	3	4	5	6
Locked-in courses	5	23	538	540	360	529
Several-hour courses	571	571	571	573	573	573
Single-section courses	11 320	12	560	118	9	10 559
Multi-section courses	61-1 530-1		530-2	61-2	530-3	530-4

Suppose further that course 580 offers 10 sections, is requested by 200 students, and is considered for scheduling at this time.

It is desirable that each section of the course average approximately 20 students. This could formally be defined by $NO = W*K1/M$, where W is a section balance indicator, $0 \leq W \leq 1$, and K1 and M are number of students requesting the course and number of sections offered by the course, respectively. Suppose the number of students who could successfully be scheduled at each time period K, SN(K), could be computed and is given as:

Time Periods	1	2	3	4	5	6
SN(K)	8	62	36	110	85	28

This means that out of 200 students requesting course 580, 8, 62, 36, 110, 85, and 28 could successfully be scheduled at each time periods 1, 2, 3, 4, 5, and 6, respectively.

It is noticed that only 8 students could successfully be scheduled at time period 1 and this is much lower than an average of 20 students per section. It could very well be decided then, that no sections be scheduled at time period 1.

Considering time periods 2, 3, 4, 5, and 6 indicates that at each one of these periods more than an average of 20 students could successfully be scheduled and, therefore, a section could be scheduled at each indicated time period. The remaining 5 sections should be scheduled at those time periods at which more than 2*20 = 40 students could successfully be scheduled. These time periods are 2, 4, and 5 where 62, 110, and 85 students could successfully be scheduled.

This indicates that 3 more sections, e.g., sections 6, 7, and 8 could be scheduled at time periods 2, 4, and 5, respectively. The remaining 2 sections should be scheduled at those time periods at which more than 3*20 = 60 students could successfully be scheduled. These time periods are again 2, 4, and 5. This indicates that the two remaining sections could be scheduled at two of the three time periods 2, 4, and 5. To select two of the three time periods, for the remaining two sections, it is noticed that only three courses are already scheduled at time period 2 and four courses are already scheduled at each one of the time periods 4 and 5. To have some balance between the periods one section could be scheduled at time period 2 and the final last section could arbitrarily be scheduled at either time periods 4 or 5, say period 4.

An attempt is made to keep conflicts at a minimum, have some degree of balance between the sections, and some degree of balance between the time periods. The course would then actually be scheduled as above and students scheduled into sections such that some balance eventually would exist between the sections and the procedure of scheduling students is the same as described in the previous section.

Suppose for the above same example a situation such as the following exists for number of students who could successfully be scheduled at different time periods.

Time Period	1	2	3	4	5	6
SN(K)	8	42	36	68	42	28

On the average, it is desirable that approximately NO = W*20 = 1*20 students be scheduled into each section. It is seen, from the above information, that at each one of the periods 2, 3, 4, 5, and 6 one section could be scheduled and approximately 20 students scheduled into it. This will take care of 5 sections 1, 2, 3, 4, and 5. For the remaining 5 sections it is seen that at each one of the time periods 2, 4, and 5 approximately 2 sections could be scheduled since at these time periods more than 2*20 = 40 students could successfully be scheduled. Therefore, sections 6, 7, and 8 could be scheduled at time periods 2, 4, and 5, respectively. Two more sections, i.e., sections 9 and 10 remain to be considered. One more section, say section 9 could be scheduled at time period 4 , since 3*20 = 60 students could successfully be scheduled at this time period. The final section, i.e., section 10, then, cannot be scheduled at any of the time periods.

In a situation such as this the average number of students to be scheduled into each section would be redefined as follows: NO = W*20 = .9*20 = 18, where W = .9 and the same procedure as above would be repeated to see if all 10 sections could successfully be scheduled, only this time on the average, it is desired that approximately 18 students be scheduled into each section. In this case the procedure yielded a feasible schedule.

If the attempt to find successful schedules for all 10 sections would have failed for the second time, a new NO = W*NO = .9*NO = .9*18 = 16 would have been redefined and the above procedure repeated again.

The index of difficulty for these type of courses are determined simply based on their number of student requests. The more the number of students requesting a course the higher the index of difficulty of that course. For a course j the index of difficulty is equal to the number of students requesting the course.

4.3. The Heuristic Algorithm

List of Variables

NOS	Total number of students
IDS	Student identification number
NSCO	Number of courses requested by a student
JCRS(L)	ID number of courses requested by a student
L	An index L = 1,...,NSCO
KSEC(L)	That section of JCRS(L) at which the student is scheduled. If the student is not scheduled or the course is not scheduled KSEC(L) = 0.
NAME	Student name
IGRD	Student grade (9th or 10th, etc.)
ISEX	Student sex (M = Male, F = Female)
IDFS	Student index of difficulty
C_s(L)	Set of courses requested by student s, L = 1,...,NSCO

J	Course index number
ITST(J)	Total number of students requesting Jth course
IST1(N1)	ID of students requesting the Jth course where N1 = 1,...,ITST(J)
ICRS(J)	ID number of the course presently being considered for scheduling
MSEC(J)	Number of sections offered by the Jth course
JS	Section index number, JS = 1,2,...,MSEC(J)
IDF(J)	Index of difficulty of the Jth course
ITYP(J)	Type of the Jth course (0 = Locked-in, >1 = Several-hour, =1, others)
NJ	Maximum number of students allowable in a section of the Jth course
ISEM(J)	Semester in which the Jth course is offered (0 = all-year, 1 = first-semester, 2 = second semester)
ITIME(J)	Course restriction (1 = there is course restriction, 0 = otherwise)
ITIME1(J)	Time restriction (1 = there is time restriction, 0 = otherwise)
ITIME2(J)	The starting time period if there is time restriction
ITIME3(J)	The final time period if there is time restriction
ITIME4(J)	Sum of the number of sections of those courses by which the Jth course is restricted
NCR(K)	ID of the Kth course by which a course is restricted (K = 1,...,ITIME4(J))
NHR	Number of hours required by a several-hour course
TR	Time restriction
CR	Course restriction

KG(IP)	Time period at which a course NCR(K) is scheduled by which the present course being scheduled is restricted
KT	Time period index, KT = 1,2,3,4,5,6
N(KT)	Number of courses scheduled at time period KT so far
IN	= N(KT)
IKP(KT,IN)	Index number of the INth course scheduled at time period KT
IKC(KT,IN)	ID number of the INth course scheduled at time period KT
IKF(KT,IN)	The section of the INth course which is scheduled at time period KT (IKF(KT,IN) = JS is the section of the INth course, IKC(KT,IN), scheduled at time period KT)
MSEM(KT,IN)	The semester of the INth course which is scheduled at time period KT (MSEM(KT,IN) = MSEM(J) is the semester in which the INth course is offered and the INth course IKC(KT,IN), scheduled at time period KT)
IT	Iteration number
KCON(J1,J2)	Number of conflicts if courses J1 and J2 are both scheduled at the same time period
LCON(IT)	Total number of conflicts at iteration IT
NOCO	Number of restricted courses in a group of single section teacher or room restricted courses (in this case NOCO = ITIME4(J))
C(J,K)	Total number of conflicts if the Jth course is scheduled at time period K (with respect to all courses already scheduled)
NCAN(KT)	Number of students which could successfully be scheduled at time period KT
NCRS(KT,KS)	ID of those students which could successfully be scheduled at time period KT, KS = 1,..., NCAN(KT)
KCRS(KT,KS)	= NCRS(KT,KS)

KTN(NP)	Time periods KT at which a section of the present course, being considered for scheduling, could be scheduled
L12(KT)	Number of students common between two courses which are offered in different semesters and considered for scheduling at time period KT
ID12(KT,I1)	ID of those students common between two courses which are offered in different semesters and considered for scheduling at time period KT where I1 = 1,...,L12(KT)
ITC(IT)	Total number of conflicts at iteration IT
JT(IT,JS)	Time periods at which different sections of the present course, being considered for scheduling, are temporarily scheduled where JS = 1,...,MSEC(J)
NK(KT)	Number of students scheduled at time period KT so far
NST(JS)	Number of students scheduled into section JS of the present course being considered for scheduling
MCRS(JS,I2)	ID of those students scheduled into section JS of the present course being considered for scheduling, I2 = 1,...,NST(JS)

Scheduling Locked-In Courses

STEP 1: Set J = 0 N(L) = 0 L = 1,6

STEP 2: Set J = J + 1 KT = ITIME(J)

If ITYP(J) > 0 Set J = J - 1, Go to STEP 4

STEP 3: N(KT) = N(KT) + 1

IKP(KT,N(KT)) = J

IKC(KT,N(KT)) = ICRS(J)

IKG(KT,N(KT)) = IG(J)

MSEM(KT,N(KT)) = ISEM(J)

IKF(KT,N(KT)) = 0

Go to STEP 2

Scheduling Several-Hour Courses

STEP 4: Set J = J + 1, LI = 1, LL = 6, IT = 1

If ITYP(J) $\leq$ 1 course is not several-hour,

set J = J - 1, go to STEP 9

STEP 5: If ITIME(J) = 0 there are no time restrictions,

go to STEP 6

Otherwise, there are time restrictions

LI = ITIME2(J)

LL = ITIME3(J) Course J must be scheduled between time periods LI and LL

STEP 6: LF = LI + NHR - 1

for LK = LI to LF compute:

$$LCON(IT) = \sum_{LK} KCON(J,J1)$$

where J1 = IKP(LK,I), I = 1,N(LK)

STEP 7: Set IHOLD(IT) = LI

LI = LI + 1

LF = LF + 1

IT = IT + 1

If LF $\leq$ LL go to STEP 6

STEP 8: Find I such that LCON(I) = min{LCON(I),I=1,...,IT}

Set LI = IHOLD(I)

LF = LI + NHR - 1

for LK = LI to LF Compute: N(LK) = N(LK) + 1
IKP(LK,N(LK)) = J
IKC(LK,N(LK)) = ICRS(J)
IKG(LK,N(LK)) = IG(J)
MSEM(LK,N(LK)) = ISEM(J)
IKF(LK,N(LK)) = 0
Go to STEP 4

Scheduling Teacher- or Room-Restricted Courses

STEP 9: Set J = J + 1 LI = 1 LL = 6 IN = J K = 1

If ITIME(J) = 0 the course is not restricted,

set J = J - 1,

Go to STEP 15

STEP 10: NOCO = ITIME4(J) Number of restricted courses in this group.

If ITIME1(J) = 0 There are no time restrictions, go to STEP 11

LI = ITIME2(J) K = LI

LL = ITIME3(J)

STEP 11: C(J,K) = 0

For I = 1,N(K) Compute:

J1 = IKP(K,I) Ith course already scheduled at time period k

If ISEM(J) * MSEM(K,I) = 2 Courses J and J1 are supposed to be offered at two different semesters. Go to STEP 11(b)

(a) C(J,K) = C(J,K) + KCON(J,J1),

go to STEP 12

(b) C(J,K) = C(J,K) - KCON(J,J1)

STEP 12: K = K + 1

If K $\leq$ LL go to STEP 11

J = J + 1, K = LI

If J $\leq$ IN + NOCO go to STEP 11

STEP 13: Solve the assignment problem:

$$\min_{j,k} \; C(J,K)\, x_{jk}$$

S.T. $\sum_{J=IN}^{IN+NOCO} x_{jk} \le 1 \qquad K = LI,\ldots,LF$

$\sum_{K=LI}^{LF} x_{jk} = 1 \qquad J = IN,\ldots,IN+NOCO$

$x_{jk} = 0$ or $1 \quad J = IN,\ldots,IN+NOCO,\ K = LI,\ldots,LF$

STEP 14: For courses J = IN,...,IN+NOCO and each $x_{jk} = 1$

compute:

```
N(K) = N(K) + 1
IKP(K,N(K)) = J
IKC(K,N(K)) = ICRS(J)
IKG(K,N(K)) = IG(J)
MSEM(K,N(K)) = ISEM(J)
IKF(K,N(K)) = 0
```

Go to STEP 9

Scheduling Single-Section Unrestricted Courses

STEP 15: Set J = J + 1 LI = 1 LL = 6

If MSEC(J) > 1 the course is multi-section,

set J = J - 1, go to STEP 22

If ITIME1(J) = 0 There is no time restriction,

go to STEP 16

LI = ITIME2(J)

LL = ITIME3(J)

STEP 16: K = LI, LCON(IT) = 0, IT = LI,LL, I = 0 Initiatization

STEP 17: For I = I + 1

If I > N(K) go to STEP 18

J1 = IKP(K,I)

If ISEM(J) * MSEM(K,I) = 2   J and J1 are offered in different semesters, go to STEP 17(b)

(a) LCON(K) = LCON(K) + KCON(J,J1), go to STEP 17

(b) LCON(K) = LCON(K) - KCON(J,J1), go to STEP 17

STEP 18: K = K + 1

If K ≤ LL set I = 0, go to STEP 17

Find K such that

M = LCON(K) = Min{LCON(K),K=LI,LL}

STEP 19: Set L = 0

For K = LI,LL

If LCON(K) = M Set L = L + 1

STEP 20: If L = 1 go to STEP 21

Find K such that

N(K) = Min{N(K)/LCON(K) = M}

STEP 21: Set

```
N(K) = N(K) + 1
IKP(K,N(K)) = J
IKC(K,N(K)) = ICRS(J)
IKG(K,N(K)) = IG(J)
MSEM(K,N(K)) = ISEM(J)
IKF(K,N(K)) = 0
```

Go to STEP 15

Scheduling Multi-Section Courses (2 to 5 Sections)

STEP 22: Set J = J + 1, LI = 1, LL = 6

NCAN(KT) = 0, L12(KT) = 0, KT = LI, LL

If MSEC(J) > 5 the course offers 6 sections or more,

go to STEP 37

If ITIME1(J) = 0 There is no time restriction,

go to STEP 23

LI = ITIME2(J)

LL = ITIME3(J)

STEP 23: If ITIME(J) = 0 there is no course restriction,

go to STEP 24

Otherwise, there are course restrictions

Restrictions are (NCR(K),K=1,ITIME4(J)), set K = 0

(a) Set K = K + 1

for time periods LI to LL find that time period

KT for which NCR(K) = IKC(KT,I),I=1,N(KT)

Then, set KG(K) = KT

If K $\leq$ ITIME4 go to STEP 23(a)

(b) Set NP = 0

for KT = LI to LL

Set NP = NP + 1

If KG(K) $\neq$ KT for K = 1, ITIME4,

set KTN(NP) = KT

STEP 24: Set N1 = 0

(a) N1 = N1 + 1, if N1 > K1 go to STEP 28

(Consider student N1 in the list of those students requesting the present course.)

IDS = IST1(N1) ID of student N1,

(JCRS(L), KSEC(L), L=1, NSCO) Courses requested by student N1 and the corresponding sections to which he is scheduled, if any.

K = 0

(b) Set K = K + 1 KT = KTN(K)

If K > NP go to STEP 24(a)

IN = 0

(c) IN = IN + 1

If IN > N(KT) go to STEP 27

If there exists an L such that {IKC(KT,IN) = JCRS(L), L=1, NSCO} go to STEP 25

Go to STEP 24(c)

STEP 25: J1 = IKP(KT,IN)

If MSEC(J1) = 1 The student is scheduled into a single section course at time period KT. Go to STEP 26

If MSEC(J1) ≠ 1 Then KSEC(L) indicates the section in which the student is scheduled.

If IKF(KT,IN) = KSEC(L) The student is scheduled at a section of a course previously scheduled at time period KT, go to STEP 26

If IKF(KT,IN) ≠ KSEC(L) go to STEP 24(c)

STEP 26: ISEM = ISEM(J)*MSEM(KT,IN)

If ISEM = 2 The present course and J1 are supposed to be scheduled at different semesters

L12(KT) = L12(KT) + 1

ID12(KT,L12(KT)) = IDS

Go to STEP 24(c)

If ISEM $\neq$ 2 Go to STEP 24(b)

STEP 27: NCAN(KT) = NCAN(KT) + 1

KS = NCAN(KT)

KCRS(KT,KS) = IDS

Go to STEP 24(b)

STEP 28: K1 = ITST(J)

MO = K1/MSEC(J)

NO = PECENT*MO

NP = 0

KT = LI

(a) If NCAN(KT) < NO go to STEP 28(b)

NP = NP + 1

KTN(NP) = KT

(b) KT = KT + 1

If KT $\leq$ LL go to STEP 28(a)

STEP 29: NP = No. of feasible time periods

M = MSEC(J) No. of sections offered by the course.

Possible assignment combinations = C_M^{NP} =

Alternative choices

JS = 0, IT = 0, ITC(IT) = 0, IT = 1,...,C_M^{NP}

(a) NK(KT) = 0, KT = LI, LL, IT = IT + 1

(b) JS = JS + 1

KT = JT(IT,JS)

ITC(IT) = ITC(IT) - L12(KT)

If JS < M go to STEP 29(b)

L1 = 0

```
STEP 30: JS = 1
         L1 = L1 + 1
         If L1 > K1  go to STEP 33
         (a) KT = JT(IT,JS)
         (b) If NK(KT) > NCAN(KT)  go to STEP 31
             If IST1(L1) > KCRS(KT,NK(KT))  go to STEP 32
             If IST1(L1) < KCRS(KT,NK(KT))  go to STEP 31
             NK(KT) = NK(KT) + 1
             Go to STEP 30
STEP 31: JS = JS + 1
         If JS ≤ M  go to STEP 30(a)
         ITC(IT) = ITC(IT) + 1
         Go to STEP 30
STEP 32: NK(KT) = NK(KT) + 1
         Go to STEP 30(b)
```

STEP 33: If IT $\le C_M^{NP}$ go to STEP 29(a)

Find IT such that

$$ITC(IT) = Min\{ITC(IT), IT=1,\ldots,C_M^{NP}\}$$

Then JT(IT,JS), JS=1,M is the best alternative choice

Set NST(K) = 0, NK(K) = 1, K = 1,...,6, L1 = 0

```
STEP 34: ITC(J) = 0
         (a) L1 = L1 + 1
             If L1 > K1  go to STEP 36
             IDS1 = IST1(L1)
             If ISEM(J) = 0  the course is all-year,
             go to STEP 35
```

```
        Set JS = 1
    (b) KT = JT(IT,JS)
        If IDS1 = ID12(KT,K), K=1, L12(KT),
           go to STEP 35(b)
        JS = JS + 1
        If JS ≤ M  go to STEP 34(b)
STEP 35: Consider S = 1,2,...,M
    (a) Find JS such that NST(JS) = Min{NST(IS), ISεS}
        Then KT = JT(IT,JS)
    (b) If IDS1 = KCRS(KT,IL), IL = 1,...,NCAN(KT),
        then NST(JS) = NST(JS) + 1,
             MCRS(JS,NST(JS)) = IDS1
        Find L such that ICRS (J) = JCRS(L), L = 1,NSCO
        Set KSEC(L) = JS,  go to STEP 34(a)
        If IDS1 ≠ KCRS(KT,IL), IL = 1,...,NCAN(KT),
        then S = S - JS
        If S = φ Go to STEP 35(c)
        Go to STEP 35(a)
    (c) ITC(J) = ITC(J) + 1
        Go to STEP 34(a)
STEP 36: JS = 0
    (a) JS = JS + 1
        KT = JT(IT,JS)
        N(KT) = N(KT) + 1
        IKP(KT,N(KT)) = J
        IKC(KT,N(KT)) = ICRS(J)
        IKG(KT,N(KT)) = IG(J)
```

IKF(KT,N(KT)) = JS

MSEM(KT,N(KT)) = ISEM(J)

If JS < M Go to STEP 36(a)

Go to STEP 23

Scheduling Multi-Section Courses
(6 Sections or More)

STEP 37: Set J = J + 1, LI = 1, LL = 6, NCAN(KT) = 0,

L12(KT) = 0, KT = LI,LL

If J > NOC end of scheduling, go to STEP 49

If ITIME1(J) = 0 there is no time restriction,

go to STEP 38.

LI = ITIME2(J)

LL = ITIME3(J)

STEP 38: If ITIME(J) = 0 there is no course restriction,

go to STEP 39

There are course restrictions given by:

(NCR(K), K = 1,ITIME4(J))

Set K = 0

(a) K = K + 1

for time periods KT = LI to LL

If NCR(K) = IKC(KT,I), I = 1,N(KT) Set KG(K) = KT

If K ≤ ITIME4(J) go to STEP 38(a)

STEP 39: Set N1 = 0

(a) N1 = N1 + 1

Consider N1th student in the list of those requesting the present course

If N1 > K1 Go to STEP 43

IDS = IST1(N1) ID of N1th student

JCRS(L),KSEC(L),L=1,NSCO Course requests and sections of courses to which N1th student is scheduled

IN = 0

KT = LI - 1

(b) KT = KT + 1

(c) Set IN = IN + 1 If KT > LL go to STEP 39(a)

If IN > N(KT) go to STEP 42

If there exists an L such that

{IKC(KT,IN) = JCRS(L), L=1, NSCO} Go to STEP 40

Go to STEP 39(c)

STEP 40: J1 = IKP(KT,IN)

If MSEC(J1) = 1 the student is scheduled into a single-section course at time KT. Go to STEP 41

If MSEC(J1) $\neq$ 1 then KSEC(L) indicates the section in which the student is scheduled

If IKF(KT,IN) = KSEC(L) the student is scheduled at a section of a course previously scheduled at time period KT. Go to STEP 41

If IKF(KT,IN $\neq$ KSEC(L), go to STEP 39(c)

STEP 41: ISEM = ISEM(J)*MSEM(KT,IN)

If ISEM = 2 The present course and J1 are supposed to be scheduled at different semesters.

L12(KT) = L12(KT) + 1

ID12(KT,L12(KT)) = IDS

Go to STEP 39(c)

If ISEM $\neq$ 2 Go to STEP 39(b)

```
STEP 42: NCAN(KT) = NCAN(KT) + 1

         KS = NCAN(KT)

         KCRS(KT,KS) = IDS

         Go to STEP 39(b)

STEP 43: K1 = ITST(J)

         MO = K1/MSEC(J)

         NO = PECENT*MO

         If ITIME = 0  Go to STEP 44

         MCAN(KT) = NCAN(KT), KT = LI, LL

         KT = LI

         (a) If KG(K) = KT  for K = 1, ITIME4(J),

             set NCAN(KT) = NO, If NCAN(KT) > NO

             Otherwise KT = KT + 1

             If KT ≤ LL  go to STEP 43(a)

             KT = LI - 1, IA = 0

         (b) KT = KT + 1

             If NCAN(KT) ≥ NO  IA = IA + 1  KTN(IA) = KT

             If KT ≤ LL  go to STEP 43(b)

             LA = 0

             Set NO2 = NO

STEP 44: If MSEC(J) ≤ IA  go to STEP 46

         LA = LA + 1

         KEEP(LA) = IA

         NO2 = NO2 + NO, IB = 0, KT = LI - 1

         (a) KT = KT + 1

             If NCAN(KT) ≥ NO2  IA = IA + 1  IB = IB + 1
                                KTN(IA) = KT
```

If KT < LL go to STEP 44(a)

If IB = 0 go to STEP 45

Go to STEP 44

STEP 45: AO = NO

NO = .9*AO (PERCNT = .9)

KT = LI - 1, IA = 0 go to STEP 43(b)

STEP 46: If MSEC(J) = IA go to STEP 47

K = KEEP(LA) + 1

I = KTN(K),...,KTN(IA)

(a) Find KT such that

N(KT) = Min{N(I), I=KTN(K),...,KTN(IA)}

Set KTN(K) = KT

K = K + 1

If K > MSEC(J) go to STEP 11

I = {KTN(K),...,KTN(IA)} - KTN(KT)

Go to STEP 46(a)

STEP 47: L1 = 0, M = MSEC(J), (NST(JS) = 0, JS = 1,...,M)

(a) L1 = L1 + 1

If L1 > K1 go to STEP 48

IDS = IST1(L1)

Consider S = 1,2,...,M

(b) Find JS such that NST(JS) = Min{NST(IS), ISεS},

then KT = KTN(JS)

If IDS = KCRS(KT,IL), IL = 1,...,NCAN(KT),

then NST(JS) = NST(JS) + 1

MCRS(JS,NST(JS)) = IDS

Find L such that ICRS(J) = JCRS(L), L = 1,NSCO

Set KSEC(L) = JS go to STEP 47(a)

If IDS $\neq$ KCRS(KT,IL), IL = 1,...,NCAN(KT),

Then S = S - JS

If S = ϕ go to STEP 47(c)

Go to STEP 47(b)

(c) ITC(J) = ITC(J) + 1

Go to STEP 47(a)

STEP 48: JS = 0

(a) JS = JS + 1

KT = KTN(JS)

N(KT) = N(KT) + 1

IKP(KT,N(KT)) = J

IKC(KT,N(KT)) = ICRS(J)

IKG(KT,N(KT)) = IG(J)

IKF(KT,N(KT)) = JS

MSEM(KT,N(KT)) = ISEM(J)

If JS < M go to STEP 48(a)

Go to STEP 37

STEP 49: End of scheduling process. All courses have been considered and scheduled.

4.4. Implementation

All the algorithms for the heuristic approach have been implemented on the IBM 370/158 computer of the University of Oklahoma.

All the programs are written in FORTRAN and compiled with IBM FORTRAN IV level G compiler.

As indicated earlier the overall solution approach could be considered in several independent modules, yet related to each other in the sense that each module or component is a logical succession of previous segments.

Therefore, an overall program is developed which is composed of several components, mainly based on the type of courses considered for scheduling, as follows:

Component 1: Program MASTERFILE

Component 2: Program SCHEDULE-1

Component 3: Program SCHEDULE-2

Component 4: Program SCHEDULE-3

To run the overall program the above components must be run successively in the order given above. The functions of each component is discussed subsequently.

4.4.1. Component 1: Program MASTERFILE

Program MASTERFILE originally sets up several files on an auxiliary disk as follows:

1. CSF: Course specification file
2. SRF: Student request file
3. CRF: Course request file
4. NRF: New request file
5. HLD: Hold intermediate results file
6. SWP: Swap intermediate results file

Information concerning courses to be scheduled are read in by this program from cards and stored in course specification file (CSF). This input information is punched on cards one card for each course as follows:

		Columns	Format
ICRS(J)	= Course ID number: (IG(J), Type A or B or blank)	1-5	I4,A1
MSEC(J)	= Number of sections offered by the course	7-8	I2
NJ	= Maximum number of students allowed in a section	9-12	I4
ITYP(J)	= Course type	13	I1
ISEM(J)	= Semester offered	14	I1
ITIME(J)	= Course restrictions	15	I1
ITIME1(J)	=Time restrictions	16	I1
ITIME2(J)	=If time restricted, beginning time	17	I1
ITIME3(J)	=If time restricted, ending time	18	I1
ITIME4(J)	=If course restricted, number of sections	19	I1
NCR1,NG1	= First course restriction	20-24	I4,A1
NCR2,NG2	= Second course restriction	25-29	I4,A1
NCR3,NG3	= Third course restriction	30-34	I4,A1

Conventions for the use of the above variables are as follows:

$$\text{ITYP(J)} = \begin{cases} 0 & \text{for locked in courses 2, 3 or 4} \\ & \text{for several-hour courses (based on number} \\ & \text{of hours} \\ 1 & \text{for other types of courses} \end{cases}$$

$$\text{ISEM(J)} = \begin{cases} 0 \text{ for all-year courses} \\ 1 \text{ for first-semester courses} \\ 2 \text{ for second semester courses} \end{cases}$$

$$\text{ITIME(J)} = \begin{cases} 0 \text{ if there is no course restriction} \\ 1 \text{ if there are course restrictions} \end{cases}$$

$$\text{ITIME1(J)} = \begin{cases} 0 \text{ if there is no time restriction} \\ 1 \text{ if there are time restrictions} \end{cases}$$

ITIME2(J) = If ITIME1(J) = 1 then ITIME2(J) is the begin-
ITIME3(J) ning time period and ITIME3(J) is the ending time periods at which course ICRS(J) is allowed to be scheduled

ITIME4(J) = If ITIME(J) = 1 (course restrictions), ITIME4(J) is the number of sections and NC1, NC2, NC3, are the corresponding courses by which ICRS(J) is restricted.

IG(J), NG1, NG2, and NG3 could be characters A, B, or blank.

Information concerning students are stored in student request file (SRF) and they are read in from cards one card for each student according to their ascending ID number as follows:

		Columns
I	= Student identification number	1-6
NAME(L)	= Student's name	7-36
IGRD	= Student's grade (9th grade, 10th grade, etc.)	37-38
ISEX	= Student's sex (male, female)	39
NSCO	= Number of courses requested by the student	40
JSCR(L), JG(L)	= List of courses requested by the student (L = 1, NSCO)	41-76

The information about courses, stored in course specification file, and about students stored in student request file is used by program MASTERFILE to generate another file called Course Request File (CRF) which includes, for each course, information about the course, and a list of ID of those students who are requesting the course. This program computes an index of difficulty for each course in the single-section and multi-section category and then arranges all the courses and their corresponding information according to the descending order of the index of difficulty in a new file called New Request File (NRF). The indices of difficulty for different groups of courses are computed as explained in previous sections. The two files HLD and SWP are set up by program MASTERFILE, but they are used by other program components when multi-section courses are being scheduled.

Information about courses and their corresponding request lists are printed such that all the information such as course number, number of sections, restrictions, index of difficulty, etc., are printed first and then the ID of all the students requesting the course are printed.

4.4.2. Component 2: Program SCHEDULE-1

SCHEDULE-1 computes a conflict matrix for all the locked-in, several-hour, single-section restricted, and single-section unrestricted courses. The conflict matrix is printed out as follows:

```
COURSE 1 (529) AND COURSE 2 (538) NUMBER OF CONFLICTS = 0
   .
   .
   .
COURSE 1 (529) AND COURSE 7 (570) NUMBER OF CONFLICTS = 1
   .
   .
   .
```

This means that no students have requested course 529 and 538 at the same time, i.e., if these two courses are scheduled at the same time no conflicts would result. On the other hand, if course 529 and 570 are scheduled at the same time period, one student would encounter a conflict, and so on.

SCHEDULE-1 considers locked-in courses first and after all the locked-in courses are scheduled, several-hour courses, single-section restricted, and single-section unrestricted courses are scheduled, respectively. For each of the above course categories the corresponding algorithm explained in previous sections is implemented.

Information concerning courses, the time periods at which they are scheduled, conflicts, ID of students encountering conflicts, etc. is printed out and a part of this information is stored in CSF to be used, in the future, when other program components are used to schedule multi-section courses. This program also prints out a table showing the time periods and the courses scheduled at their corresponding time periods. The input data for program SCHEDULE-1 is already stored in one of several files mentioned earlier and, therefore, there is no new input data to be read in by this program.

4.4.3. Component 3: Program SCHEDULE-2

SCHEDULE-2 is designed for scheduling multi-section courses which offer less than 6 sections employing heuristics and models discussed in earlier sections for these types of courses. The input data to this program comes from the information stored in various files set up by program MASTERFILE and computed partially, in some cases, by program SCHEDULE-1.

Information about courses, the corresponding sections, time periods at which each section is scheduled, ID of students scheduled into each section, etc., is printed out and a part of this information is stored in CSF and CRF to be used, in the future, when other multi-section courses and other program components are considered. Finally, this program also prints out a table showing the time periods and the courses and sections of courses and their corresponding time periods.

4.4.4. Component 4: Program SCHEDULE-3

This program is designed for scheduling courses which offer 6 sections or more employing heuristics and procedures discussed earlier for these types of courses. The input-output operations of this program are very similar to that of SCHEDULE-2.

4.4.5. Setting Up the Program and Data Deck

Data deck for program MASTERFILE is shown in Figure 8.

Other programs, i.e., SCHEDULE-1, SCHEDULE-2, and SCHEDULE-3 do not require input information from cards and they are simply run, one after the other, using proper control cards.

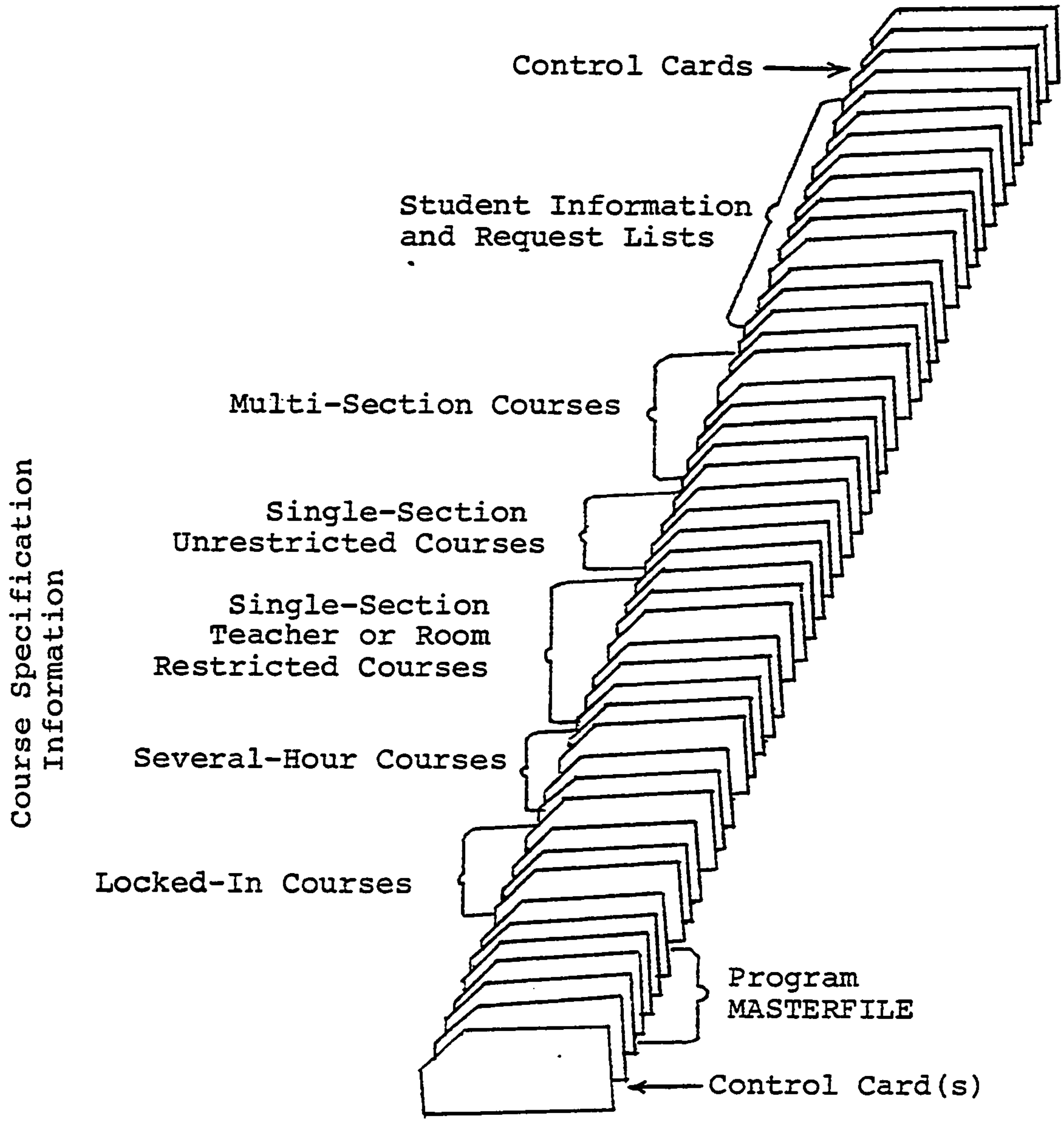

Figure 8.

4.5. Computational Experience

The algorithms described in Chapter IV and incorporated in a program were tested on a data set obtained from Central Mid-High School, in Norman, Oklahoma. This school was selected as a typical example because of its relatively complex school structure. The school, unfortunately, has no schedules generated by other systems and therefore it is not possible to compare this system with other systems. However, a careful manual class schedule has been constructed by the school principal for the data set mentioned above.

The school had 714 students and 68 courses with a total of 157 sections. There were 11 locked-in courses, 4 several-hour courses (4-hours and 3-hours length), 6 single-section teacher or room restricted courses, 7 single-section unrestricted courses, and all the rest (40 courses) were multi-section courses offering between 2 and 10 sections. Some of the multi-section courses were restricted by other multi-section courses and/or other single-section courses. There were 10 first-semester courses (single-section and multi-section), 9 second-semester courses (single-section and multi-section), and the rest of the courses were of all-year type.

The class schedule constructed by the heuristic algorithms generated student conflicts less than one-half student conflicts resulting from the manual class schedule as shown in Appendices II and III. The number of conflicts generated by scheduling different types of courses using the heuristic approach and total number of conflicts for the second run of the manual schedule are shown below:

Course Type	Number of Courses	Total Number of Conflicts
Locked-in	11	
Several-hour	4	54
Teacher or room restricted	6	
Single section unrestricted	7	
Multi-section (2-5 sections)	27	84
Multi-section (6 sections and more)	7	47
Total number of conflicts		185
Manual schedule second run,* Total number of conflicts		359

*The corresponding first run manual schedule generated over 400 conflicts.

There was a good degree of balance between different sections of most courses (as can be seen in the sample output part) although a measure of balance or imbalance was not calculated.

The relevant cost factors for the system IBM 370/158 computer of the University of Oklahoma are shown below:

CPU time	$.075/sec.
Storage residency	$.003/1K-min.
Cards read	$.75/1000 cards
Lines printed	$.85/1000 lines
Disk I/O	$.25/1000 Excp

Different components of the overall program were quite fast as far as CPU time is concerned. For one clean run from original input data to final complete class schedule the following information was obtained.

Program	C.P.U. Time in Seconds	C.P.U. Cost Dollars	Total Cost Dollars
MASTERFILE	25	1.90	4.50
SCHEDULE-1	21	1.56	3.40
SCHEDULE-2	193	14.50	18.89
SCHEDULE-3	66	4.94	7.04
Total	305	22.90	33.83

The total cost column includes the sum of CPU, storage residency, cards read, lines printed, and Disk I/O costs for each component program. Considering the above information it is seen that:

CPU time per student = 305/714 = .4 sec.

CPU cost per student = $.075*.4 = $.03 = 3 cents

Total cost per student = 33.83/714 = $.046 = 4.6 cents

As indicated above, the costs are for one successful run of each program component. It is, however, unlikely that a single first run of each component would be successful, especially for program MASTERFILE where original errors in the input data could easily require several runs of this program. The comparison of costs between this system and others is not easily possible, since there is no way of knowing how much it would cost to perform class scheduling for this case using other systems.

The costs per student figures, nonetheless, could be roughly compared to those of other programs or systems such as IBM's CLASS (Class Load And Student Scheduling) and ECSS (Educational Coordinates Scheduling System) which is a much improved variation of the SSSS (Stanford School Scheduling System). In the case of IBM CLASS [21] computer costs ran approximately 35 cents per student for performing scheduling for schools in the Cleveland, Ohio-Pittsburgh, Pennsylvania area. Salazar [37] indicates that traditional school scheduling work (one pass from data to final schedule, excluding final printouts) using the ECSS system represents computer expenditures of 25 to 30 cents per student. The comparison shows that the present system requires costs which are almost one tenth of those encountered when using such systems as IBM CLASS and ECSS.

Finally, from the experience of the present system implementation, it is the author's belief that the overall system composed of several components, processed successively and not at the same time, is suitable for implementation on small computers. The main reason being that each of the programs MASTERFILE, SCHEDULE-1, SCHEDULE-2, and SCHEDULE-3 are relatively small size programs. The sizes of these programs for runs using Central Mid-High data, as indicated by FORTRAN IV level G compiler is summarized below:

Program	Size in K-bytes
MASTERFILE	15.5
SCHEDULE-1	23.3
SCHEDULE-2	22.2
SCHEDULE-3	20.0

Sacrifices, however, would perhaps be necessary to make such as giving up CPU speed for lower memory requirements or reducing a component's size by eliminating some of its non-essential options. To keep main memory requirements relatively low, auxiliary storage such as magnetic disks for setting up different files and storing intermediate and final results would be necessary.

4.6. Summary

In this chapter a heuristic scheduling algorithm was developed and coded in FORTRAN which is suitable for generating class schedules for traditional and modified school structures.

The overall algorithm was composed of several components. Each component incorporated heuristics, mathematical optimization techniques, or a combination of both and was specifically developed for scheduling a specific type of course being considered.

For scheduling groups of teacher or room restricted courses, an assignment problem was constructed for each group of courses restricted by a teacher or room. The solution to this assignment problem was used to schedule the group of restricted courses simultaneously and optimally with respect to all other courses already scheduled.

For multi-section courses an integer programming model was presented, and an enumerative procedure used to schedule a multi-section course optimally with respect to all other courses already scheduled.

The heuristic algorithm was implemented using actual data from a local high school. Computational results indicated that the algorithm was fast, generated relatively few conflicts, and computer memory requirements were low. Computational results were reported and compared to a manually constructed schedule using the same set of data.

CHAPTER V

CONCLUSIONS AND SUGGESTIONS FOR FURTHER RESEARCH

One important characteristic of the overall algorithm is its relatively low main memory requirements and use of auxiliary memory for the storage of data. The author believes that the algorithm could be implemented on a small computer installation, such as those often available to many secondary schools. However, some compromises would perhaps have to be made, such as the trade-off between speed and memory requirements or, in other words, sacrificing computers speed for lower memory requirements.

5.1. Conclusions

Considering the theoretical model for the problem of scheduling students into an existing class schedule it is seen that:

(a) The model based on network flow concepts could be used to obtain an overall optimum solution by formulating and solving a small network flow problem for each student.

(b) The model is flexible in the sense that different types of courses, time periods, cycles, etc., could be incorporated in it.

(c) Other applications of the model could be considered such as resolving student conflicts, evaluating a heuristic procedure, evaluating a class schedule constructed by a heuristic procedure, etc.

(d) The model could be quite practical since there are extremely efficient techniques for solution of network flow problems of the type encountered here.

Considering the heuristic system, designed for traditional and modified school structures, developed, implemented, and tested, it is concluded that:

(a) The system is composed of several components each designed for scheduling one or several special types of courses. The courses are considered for scheduling successively and each course, or group of courses, theoretically, is scheduled optimally with respect to all other courses which are already scheduled.

(b) The system is quite fast in terms of computer cpu time and therefore economical in terms of costs. In the case of a complex schedule constructed for a local school cpu times of .4 seconds per student and total costs of approximately 5 cents per student were observed.

(c) The system is very flexible in the sense that it is capable of handling several types of courses and more importantly could be revised and improved to make it able to handle still more complex situations in terms of courses, time periods, cycles, etc.

(d) The system is efficient in terms of number of student conflicts generated. In the case of class schedule mentioned in part (b) above the number of student conflicts generated using this system was less than one-half the number of student conflicts generated by a carefully manually constructed class schedule for the same data.

(e) In most cases there was a good degree of balance between different sections of each course for Central Mid-High final class schedule.

(f) Since the system is composed of several small components it is suitable for implementation on small computers which are often available to secondary schools.

5.2. Suggestions for Further Research

Further research is recommended in three main areas. These include theoretical investigations, improvements on the existing programs and algorithms, and development of new programs and algorithms. More specifically, the following areas are suggested for further research:

(a) Development of models similar to those investigated in this research, possibly using network flow theory, for other types of scheduling problems such as multi-section scheduling, etc.

(b) Design, development, implementation and testing of algorithms and programs based on the network flow model discussed here to schedule students into an existing class schedule, resolve conflicts generated by a heuristic approach, and evaluate a heuristic approach or its corresponding class schedule.

(c) Computational experience on several other data sets from different schools is highly recommended to gain insight into weak and strong points of the present system and obtain more reliable information such as speed, efficiency, flexibility, section balancing, etc.

(d) Improve the present system for reduced cpu time (or cost) and memory requirements possibly by program modifications to represent arrays in bit strings for more efficiency. This may be achieved by having parts of different programs written in assembler language. Other improvements include allowing for computation of a measure of balance or imbalance between different sections of a course, refined output information, etc.

(e) Revise the present system to allow for more scheduling flexibility such as use of weekly or other types of cycles in addition to daily cycles, use of conflicting time periods, etc. It should be pointed out that the present system allows for these types of revisions and modifications and all the algorithms utilized by the present system could easily be modified and used in more complex situations indicated above.

(f) Finally, assuming a class schedule is constructed using a heuristic technique, possibilities of improvements on the number of conflicts for this class schedule should be investigated. These types of improvements could be obtained in one of two ways: One way is to attempt to find feasible schedules for some of the students who have encountered a conflict. This is the problem of finding a feasible schedule for a set of students when a class schedule exists. It was shown, in previous chapters, that this problem could be solved optimally using a network flow model. The second way of improving on a present schedule could be to deschedule and reschedule one or a set of courses which produce a reduction on the total number of students encountering conflicts. In this case existing methods such as piecewise interchange or other optimization methods could be promising.

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APPENDIX I

TERMINOLOGY

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TERMINOLOGY

Master Schedule: Time schedule of courses

Conflict = student conflict: When two single-section courses requested by a student are scheduled at the same time period the student is encountering a conflict.

Time period = Time block: A time interval at which courses could be scheduled such as 8-9 A.M., 9-11 A.M., etc.

Conflicting Time Blocks: Time blocks or time periods which overlap such as 8-9 A.M., Monday and 8-11 A.M., Monday.

Cycle: A time interval during which all courses are repeated once, such as a day where all courses are repeated every day at the same time or a week where all the courses meet T Th or MWF at the same time every week.

Heuristic: An intuitive rule which works well in real life and is usually based on past experience. For example "more crowded single-section courses are harder to schedule than (and therefore should be scheduled before) less crowded single-section courses."

Index of Difficulty: A number assigned to each course based on some heuristics such as number of sections that the course is offering, number of students requesting the course, types of courses that these students are requesting, etc.

This number represents the relative difficulty of scheduling this course with respect to all other courses.

Algorithm: A step by step solution procedure for a problem, specially a mathematical problem, frequently involving repetition of one or more operations.

Student Request List: A list containing information about students and courses that they are requesting. For each student the list contains students, ID, name, grade, sex, and courses requested.

Course Specification List: A list containing information about courses offered. For each course the list contains course number, recommended number of sections, recommended index of difficulty, semester in which the course is offered, any course or time restrictions, etc.

Conflict Matrix:

1. Course Conflict Matrix: A matrix constructed by listing courses both row wise and column wise and each element of the matrix represents number of students which would encounter a conflict if the corresponding row and column courses are scheduled at the same time: example

	20	21	22
20	0	1	2
21	1	0	2
22	2	3	0

Suppose there are only three courses 20, 21, and 22. The conflict matrix above (considering the first row) indicates that if course 20 and course 21 are scheduled at the same time one student would encounter a conflict and if course 20 and 22 are scheduled at the same time two students would encounter conflicts and so on.

The conflict matrix would be constructed for single-section courses only.

2. Time Block Conflict Matrix: A matrix constructed by listing time blocks both row wise and column wise and each element of the matrix is a zero or one. A one indicates that the corresponding time blocks overlap and a zero indicates that the corresponding time blocks do not overlap. For example, consider:

Time Block	Time	
1	8-9	M.W.F.
2	9-10	M.W.F.
3	8-10	M.W.F.

then the conflict matrix is:

		Time Block		
		1	2	3
Time	1	1	0	1
blocks	2	0	1	1
	3	1	1	1

A "1" in row 2 column 3 means that time blocks 2 and 3 overlap. A "0" in row 2 column 1 means that time blocks 2 and 1 do <u>not</u> overlap.

APPENDIX II

SAMPLE MANUAL SCHEDULE, CENTRAL MID-HIGH SCHOOL

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT	
ADA390	ADAMS, CINDY S	09	5441	50			
			5461	20			
			5801	10			
			5521	40			
			5331	60			
			5671	30			
AKE350	AKERMAN, RALPH T	09	5733	10			
			5591	60			
			5481	50			
			5531	40			
AKI330	AKIN, PATRICIA S	10	5611	60			
			5331	30			
			0121	40			
			~~5071~~	~~10~~			399140
			5691	50			537111
			5581	20			
					~~5371~~	~~99~~	~~SECTION CONFLICT~~
ALE950	ALEXANDER, LORNA	10	0081	30			
			5311	50			
			3091	31			
			5691	61			
			5651	41	5581	20	
					~~5581~~	~~99~~	~~SECTION CONFLICT~~
			5371	10			

STUDENT COURSE CONFLICT LISTING 7/31/78

7

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT
ALE960	ALEXANDER, MICHAEL	09	5733	10		
			5401	40		
			5481	50		
			5521	60		
ALI300	ALINGER, DANIEL	10	5491	30		
			~~[illegible]~~	~~20~~	0231	40
					~~5541~~	~~99 CAPACITY CONFLICT~~
			3031	42	5561	20
			5691	10		
			5651	50		
			5331	60		
ALL300	ALLEN, TONY W	09	5781	10		
			5591	60		
			~~5611~~	~~40~~	5801	31
			5681	50		
			5571	20	5341	40
					~~5541~~	~~99 SECTION CONFLICT~~
ALL645	ALLISON, JALYN D	10	5713	10		
			5511	40		
			5391	50		
			5581	60		

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	COURSES ACCEPTABLE NO SECT	COURSES UNACCEPTABLE NO SECT
AMO750	AMOS, DENISE	10	5723 40	
			5561 10	
AND150	ANDERSON, DIETRA J	09	3211 40	0241 40
				5521 10
			~~5241 30~~	5801 21
			~~5311 50~~	5341 30
			5681 60	~~5391 99 SECTION CONFLICT~~
				~~5321 93 CAPACITY CONFLICT~~
			~~[illegible]~~	5311 30
AND265	ANDERSON, ROBERT M	10	5591 60	
			0121 30	
			~~3991 12~~	
			5691 50	3991 30
			5651 40	5371 41
			5581 20	
				~~5311 99 SECTION CONFLICT~~
AND600	ANDRIASSIAN, ALBERT	09	~~5421 40~~	0231 20
			5011 50	5341 40
			5681 60	5571 30
			~~5571 20~~	
				~~[illegible] 29 SECTION CONFLICT~~
			5311 10	3991 20

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT
BAB600	BABICH, KRISTEN E	09	5733	10		
			5511	40	5311	60
					~~[illegible]~~	~~99 SECTION CONFLICT~~
					~~0211~~	~~99 SECTION CONFLICT~~
			5521	50		
BAC100	BACHRACH, CASSIE L	10	5713	10		
			5391	50		
			0211	40		
			3091	40		
			5581	60		
BAC400	BACON, PEGGY S	09	5441	50		
			3241	30		
			0081	30	5801	21
			~~5011~~	~~40~~	5341	40
			5681	60	~~5341~~	~~99 SECTION CONFLICT~~
			5531	10		
BAC430	BACON, RANDALL D	10	5591	60		
			0241	30	3991	12
			3091	18	5371	11
			5671	50		
			5651	40		
			5581	20		
					~~5371~~	99 SECTION CONFLICT

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT
BAR460	BARNARD, GERALD R	09	~~[illegible]~~	~~[illegible]~~	5341	50
					~~[illegible]~~	~~[illegible] FACULTY CONFLICT~~
			5571	21	5481	10
			~~[illegible]~~	~~[illegible]~~	5811	40
			~~[illegible]~~	~~[illegible]~~	5681	60
			5311	30		
BAR490	BARNARD, MARVIN H	10	5723	40		
			5661	31		
			5481	10		
			3801	20		
			0091	20		
BAR630	BARNETT, ROBERT D	10	5701	10		
			5723	40		
			0601	20		
			3091	20		
			5671	30		
BAR710	BARNHILL, RITA K	09	5801	40	5531	30
			~~[illegible]~~	~~[illegible]~~	5311	60
			~~[illegible]~~	~~[illegible]~~	5671	10
			5331	21	~~[illegible]~~	~~[illegible] SECTION CONFLICT~~
			5251	50		

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT
BUT260	BUTLER, DANNY J	10	5591	60		
			3051	10		
			0091	10		
			5691	40		
			5651	30		
			5581	20		
			5371	50		
BUT300	BUTLER, GLENNA J	10	5713	10		
			5321	40		
					~~[illegible]~~	~~77 SECTION CONFLICT~~
					~~[illegible]~~	~~01 SECTION CONFLICT~~
			5581	50	5461	60
BUT600	BUTLER, TINA M	09	5611	60		
			~~5611~~	~~40~~	5801	31
			5681	50	5341	40
					~~[illegible]~~	~~[illegible] SECTION CONFLICT~~
			5531	10	5461	20
			~~5311~~	~~30~~		
BYR175	BYRD, BARBARA M	10	5791	10		
			5561	20		
			5311	30		
			5691	51		
			5651	60		
			5371	40		

STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	COURSES ACCEPTABLE NO SECT	COURSES UNACCEPTABLE NO SECT	
CAN397	CANO, LISA L	09	5621 10		
			5811 50		
			5681 40		
			5571 21		
			5341 60		
			5311 30		
CAP255	CAPE, CHESTER D	10	5591 60		
			0081 30		
			5521 10		399 1 30
			~~0091 31~~		537 1 21
			5691 40		
			5651 50		
				~~[illegible] SECTION CONFLICT~~	
CAR370	CARPENTER, DAVID	10	5723 40	5571 10	
				~~[illegible] SECTION CONFLICT~~	
			~~5661 21~~	0091 21	
			~~5301 10~~		
			~~0091 10~~	1 5661 31	
CAR987	CARSON, DAN	10	5751 50		
			5561 10	5691 40	
			5311 30		
			~~5691 60~~	5591 60	
			~~5691 11~~		
			5371 20		

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STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO SECT	UNACCEPTABLE NO SECT
CLE430	CLEAR, KEAL WAYNE	10	5591 61	9791 10
			~~[illegible]~~	0091 12
			~~[illegible]~~	5561 80
			~~[illegible]~~	5331 21
			~~[illegible]~~	5801 40
			~~[illegible]~~	
				~~[illegible] SECTION CONFLICT~~
			~~[illegible]~~	5671 51
CLI570	CLINKENBEARD, LISA	10	5751 50	
			5713 10	Had Bcl in Summer.
			5461 60	5311 30 (out of tram)
				~~[illegible] SECTION CONFLICT~~
			5501 40	
CL0700	CLOUSE, CYNTHIA L	09	~~5011 60~~	
			5011 60	5301 30
			5601 40	
			5571 21	5341 50
				~~[illegible] SECTION CONFLICT~~
			5311 10	
CL0920	CLOUSE, DAVID A	09	5591 60	
			5301 30	
			~~5011 40~~	5801 21
			5601 50	
			5571 10	5341 40
				~~5341~~ 99 SECTION CONFLICT

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STUDENT COURSE CONFLICT LISTING 7/31/78

STUDENT NO.	NAME	CLASS	ACCEPTABLE NO	ACCEPTABLE SECT	UNACCEPTABLE NO	UNACCEPTABLE SECT
DAN305	DANIEL, DEBORAH C	09	5611	60		
			5501	50		
			5801	10		
			5521	40		
			5331	20		
			5671	30		
DAN307	DANIEL, JANIE I	09	5611	60		
			3211	40		
			0211	40		
			5801	10		
			5521	50		
			5331	20		
			5671	30		
DAN325	DANIELS, GEORGE D	09	5591	60		
			5301	30		
			~~5011~~	~~10~~	5801	21
			5681	50	5311	40
			5571	10	~~5311~~	~~99~~ SECTION CONFLICT
DAN330	DANIELS, RON D	10	5591	60		
			0171	50		
			~~5091~~	~~10~~		
			5691	30	5371	11
			5651	20	3991	50
			5581	40	~~5311~~	~~99~~ SECTION CONFLICT.

STUDENT COURSE CONFLICT LISTING 7/31/78

SECTION CONFLICT 292

CAPACITY CONFLICT 67

COURSE UNAVAILABLE 0

STUDENT NO.	NAME	CLASS	COURSES ACCEPTABLE NO	SECT	COURSES UNACCEPTABLE NO	SECT
MUN300	Munday, Anthony	9	5733	10		
			5521	50	5991	40
			5611	60		
BUT350	Butler, James L	10	5651	60		
			0091	11		
			3991	10		
			5581	20		
			5381	30		
			5371	40		
			5691	50		
CAR700	Carter, William H	10	5691	10		
			5371	21		
			5381	30		
			5561	40		
			5501	50		
			5651	61		
MAL400	Malone, Catina L	9	5801	11		
			5671	20		
			5561	30		
			5381	40		
			5311	50		
			5521	60		
NOR700	North, Terry	10	5521	10		
			5371	20		
			0091	30		
			3241	30		
			5651	41		
			5691	51		
			[illegible]	[illegible]		

APPENDIX III

PROGRAM LISTINGS AND SAMPLE OUTPUTS

APPENDIX III

PART A. INPUT LISTINGS

NO. OF LOCKED-IN COURSES	NO. OF SEVERAL-HOUR COURSES	NC. OF TEACHER OR ROOM-RESTRICTED COURSES
11	4	6

COURSE	SECTION	SEATS	TYPE	SEMESTER	ITIME	ITIME1	ITIME2	ITIME3	ITIME4	NCR1	NCR2	NCR3
529	1	0	0	0	0	6	0	0	0	0	0	0
538	1	0	0	0	0	3	0	0	0	0	0	0
540	1	0	0	0	0	4	0	0	0	0	0	0
541	1	0	0	0	0	4	0	0	0	0	0	0
550	1	0	0	0	0	5	0	0	0	0	0	0
551	1	0	0	0	0	4	0	0	0	0	0	0
559	1	0	0	0	0	6	0	0	0	0	0	0
561	1	0	0	0	0	6	0	0	0	0	0	0
578	1	0	0	0	0	1	0	0	0	0	0	0
579	1	0	0	0	0	1	0	0	0	0	0	0
12	1	0	0	1	0	3	0	0	0	0	0	0
570	1	0	4	0	0	1	1	4	0	0	0	0
571	1	0	3	0	0	1	1	3	0	0	0	0
572	1	0	3	0	0	1	4	6	0	0	0	0
573	1	0	3	0	0	1	1	3	0	0	0	0
19	1	0	1	1	1	1	4	5	2	0	0	0
21	1	0	1	1	0	1	4	5	2	0	0	0
320	1	0	1	2	1	1	4	5	2	0	0	0
321	1	0	1	2	0	1	4	5	2	0	0	0
575	1	0	1	0	1	0	0	0	2	0	0	0
577	1	0	1	0	0	0	0	0	0	0	0	0
532	1	0	1	0	0	0	0	0	0	0	0	0
547	1	0	1	0	0	0	0	0	0	0	0	0
555	1	0	1	0	0	0	0	0	0	0	0	0
7	1	0	1	1	0	0	0	0	0	0	0	0
16	1	0	1	1	0	0	0	0	0	0	0	0
306	1	0	1	2	0	0	0	0	0	0	0	0
316	1	0	1	2	0	0	0	0	0	0	0	0
8	2	0	1	1	0	1	1	4	0	0	0	0
308	2	0	1	2	0	1	1	4	0	0	0	0
562	2	0	1	0	1	0	0	0	1	561	0	0
564	2	0	1	0	1	0	0	0	3	561	562	0
530	2	0	1	0	1	0	0	0	1	7	0	0
546	2	0	1	0	1	0	0	0	1	547	0	0
550	2	0	1	0	1	0	0	0	1	559	0	0
5	2	0	1	1	1	0	0	0	3	7	530	0
23	2	0	1	1	1	0	0	0	2	575	577	0
24	2	0	1	1	1	0	0	0	3	547	546	0
305	2	0	1	2	1	0	0	0	3	306	530	0
323	2	0	1	2	1	0	0	0	2	575	577	0
324	2	0	1	2	1	0	0	0	3	547	546	0
549	2	0	1	0	0	0	0	0	0	0	0	0
534	3	0	1	0	0	1	4	6	0	0	0	0
548	3	0	1	0	1	0	0	0	2	549	0	0
568	3	0	1	0	0	1	4	6	0	0	0	0
581	3	0	1	0	0	1	4	6	0	0	0	0
531	4	0	1	0	1	0	0	0	1	532	0	0
553	4	0	1	0	0	1	1	4	0	0	0	0
557	4	0	1	0	1	0	0	0	2	8	0	0
9	4	0	1	1	0	1	1	4	0	0	0	0
309	4	0	1	2	0	1	1	4	0	0	0	0
525	5	0	1	0	0	0	0	0	0	0	0	0
535	5	0	1	0	0	0	0	0	0	0	0	0
556	5	0	1	0	0	0	0	0	0	0	0	0
558	5	0	1	0	0	0	0	0	0	0	0	0
1	5	0	1	1	0	0	0	0	0	0	0	0

2	5	0	1	1	0	0	0	0	0	0	0	0
301	5	0	1	2	0	0	0	0	0	0	0	0
302	5	0	1	2	0	0	0	0	0	0	0	0
552	6	0	1	0	0	0	0	0	0	0	0	0
569	7	0	1	0	1	0	0	0	2	16	316	0
533	7	0	1	0	0	0	0	0	0	0	0	0
537	7	0	1	0	0	0	0	0	0	0	0	0
565	7	0	1	0	0	0	0	0	0	0	0	0
567	7	0	1	0	0	0	0	0	0	0	0	0
580	8	0	1	0	0	0	0	0	0	0	0	0
14	10	0	1	1	0	0	0	0	0	0	0	0
314	10	0	1	2	0	0	0	0	0	0	0	0

STUDENT ID	NAME	GRADE	SEX	REQUESTS	REQUEST LIST						
1001	ADAMS CINDY SUE	9	F	6	533	544	546	552	567	580	
1002	CHRISTIAN JEFF S	9	M	6	534	535	557	559	568	581	
1003	AKERMAN RALPH TALBE	9	M	4	548	553	559	573			
1004	ALEXANDER MICHAEL A	9	M	4	540	548	552	573			
1005	ALLEN TONY W	9	M	6	534	557	559	568	578	581	
1006	ANDERSON DIETRA JEA	9	F	7	24	321	531	534	552	568	581
1007	ANDERSON ALBERT	9	M	6	531	534	542	557	568	581	
1008	ANNESLEY JAMES	9	M	6	530	534	548	557	568	581	
1009	ARGO GEORGIA LYNN	9	F	6	531	533	550	553	567	580	
1010	ARGO MARK WAYNE	9	M	6	533	548	553	559	567	580	
1011	ATNIP CHUCK RAY	9	M	6	534	535	557	559	568	581	
1012	AYRES KAREN RENEE	9	F	6	531	533	552	564	567	580	
1013	BOBICH KRISTEN ELIZ	9	F	5	21	321	551	552	573		
1014	BACON PEGGY SUE	9	F	7	8	324	534	544	553	568	581
1015	BAKER LEAH ROBIN	9	F	3	530	546	570				
1016	BALLOU CATHERINE L	9	F	6	531	533	553	561	567	580	
1017	BALSBAUGH TOM JAY	9	M	6	531	533	552	560	567	580	
1018	BARELA LORI ANN	9	F	6	533	551	553	567	577	580	
1019	BARNARD GERALD RAY	9	M	6	531	534	548	557	568	581	
1020	BARNHILL RITA KAYE	9	F	6	525	531	533	553	567	580	
1021	BARR SHARI KAY	9	F	6	530	531	534	557	568	581	
1022	BELDEN CHERYL LYNN	9	F	6	531	533	552	567	575	580	
1023	BELL DONNA LEE	9	F	4	531	538	552	573			
1024	BEST FRANK	9	M	7	23	399	534	557	568	578	581
1025	BEVERLY ROUSCO SCOTT	9	M	4	531	552	559	573			
1026	BICKHAM GARY	9	M	6	534	535	548	557	568	581	
1027	BICKHAM GWENDOLYN	9	F	6	534	546	557	568	578	581	
1028	BLAKE MARICE GIBBS	9	M	6	533	548	553	560	567	580	
1029	BOYD MARGARET ELEAN	9	F	4	530	552	573	578			
1030	BOYCE KARLA LEE	9	F	7	8	324	531	533	552	567	580
1031	BOYD TRACEY ALISON	9	F	6	530	533	552	564	567	580	
1032	BRADLEY JOSEPH ANDERSON	9	M	4	548	550	558	573			
1033	BRATCHER TERRI LYNN	9	F	4	531	546	553	573			
1034	BRAWNER DANA LEA	9	F	5	19	320	551	552	573		
1035	BRESHEARS DEBRA ANN	9	F	6	531	534	546	557	568	581	
1036	BROCK TIMOTHY JAY	9	M	6	530	533	546	557	567	580	
1037	BROMS DONALD AUSTIN	9	M	6	531	533	552	559	567	580	
1038	BROWN TRACY DAWN	9	F	6	531	533	546	553	567	580	
1039	BRUCE TRACY LYNN	9	F	7	5	321	533	558	564	567	580
1040	BRUEHL KIM ANN	9	F	7	24	308	531	533	552	567	580
1041	BURKETT WILLIAM SID	9	M	7	5	306	534	551	557	568	581
1042	BURLESON TEDDI ELIZ	9	F	6	533	550	552	564	567	580	
1043	BURNETT MICHAEL RAY	9	M	4	530	550	552	573			
1044	BURNETT TIMOTHY ALL	9	M	4	531	542	552	573			
1045	BURNSWORTH JUDI AN	9	F	7	24	305	533	546	557	567	580
1046	BUTLER TINA MARIE	9	F	6	531	534	553	561	568	581	
1047	CADY JANANN L	9	F	6	531	533	550	553	567	580	
1048	CAMPBELL DOUGHLAS M	9	M	4	534	557	568	581			
1049	CANO DANNY LOZANO	9	M	6	531	534	557	559	568	581	
1050	CANO LISA LOZANO	9	F	6	531	534	557	562	568	581	
1051	CASEY JERRY GLENN	9	M	6	533	548	552	559	567	580	
1052	CASKEY JAMES WINDE	9	M	6	531	533	552	559	567	580	
1053	CAVENDISH LISA MARIE	9	F	7	21	321	533	552	561	567	580

1054	CEDENO CHOURIO YAME	9	F	6	323	533	538	553	567	580		
1055	CHEVES KATHRYN MICH	9	F	6	531	533	557	567	575	580		
1056	CHOU SHOU YU SCOTT	9	M	4	8	531	558	573				
1057	CLARK RICHARD LEE	9	M	6	530	534	548	558	568	581		
1058	CLOUSE CYNTHIA LOU	9	F	6	530	531	534	557	568	581		
1059	COLLINS DAVID PATRI	9	M	4	544	558	559	573				
1060	CORLEY RAY	9	M	4	548	552	559	573				
1061	CORNELL PAUL	9	M	6	534	548	553	559	568	581		
1062	CLOUSE DAVID ALVIN	9	M	6	530	534	557	559	568	581		
1063	CONNER DAVID BRYAN	9	M	4	531	552	559	573				
1064	CRAIG BALINDA JILL	9	F	4	538	551	552	573				
1065	CRAIG ROBYN BEA	9	F	6	530	533	552	561	567	580		
1066	CRANDELL JUANITA M	9	F	6	531	533	553	567	577	580		
1067	CROWN TAMARA DAWN	9	F	7	8	316	533	552	561	567	580	
1068	CURREN EARL LEROY	9	M	4	533	567	567	580				
1069	DAIGNAULT ROBERT	9	M	6	530	533	550	553	567	580		
1070	DANIEL DEBORAH CAR	9	F	6	533	550	552	561	567	580		
1071	DANIEL TANIE IRENE	9	F	7	21	321	533	552	561	567	580	
1072	DANIELS GEORGE DANE	9	M	6	530	534	557	559	568	581		
1073	DANNER KEVEN CHELT	9	M	6	23	533	544	553	567	580		
1074	DARNER KEITH	9	M	6	530	533	548	557	567	580		
1075	DAVDSON CARRIE LYN	9	F	7	8	324	531	533	552	567	580	
1076	DAVIDSON JILL ANN	9	F	4	530	531	552	573				
1077	DAVIS DANA ROBIN	9	F	5	24	308	531	553	573			
1078	DAVIS FRANK JAMES	9	M	6	533	548	552	559	567	580		
1079	DAVIS LAWRENCE JR	9	M	7	16	308	533	552	559	567	580	
1080	DELHEIMER JILL LYNN	9	F	6	531	533	546	557	567	580		
1081	DENSMORE JIMMY ROYC	9	M	6	531	533	557	567	575	580		
1082	DICKSON DORELLA JE	9	F	7	19	320	531	533	553	567	580.	
1083	DIRHAM BARRIE ELLEN	9	F	6	530	533	546	553	567	580		
1084	DOMINGUEZ DANIEL JA	9	M	6	533	548	552	559	567	580		
1085	DONATHAN MICHAEL EV	9	M	7	19	320	531	533	553	567	580	
1086	DOWNEY FLAVIL LEE	9	M	6	533	557	560	568	578	581		
1087	DRUM JONATHAN GILBE	9	M	6	530	533	550	553	567	580		
1088	DUNCAN BILL LEVI	9	M	4	544	553	559	573				
1089	DUNN KELLI JO	9	F	6	531	534	553	561	568	581		
1090	EARLS MARTIN LYNCH	9	M	8	5	21	321	323	533	553	567	580
1091	ELLIOT TAMMY KAY	9	F	7	8	324	534	557	564	568	581	
1092	ELLIS BRADLEY MART	9	M	6	531	533	558	559	567	580		
1093	EMERY MICHAEL LEE	9	M	7	5	306	534	552	559	568	581	
1094	EMBERLIN PATRICA LYNN	9	F	7	5	324	534	557	564	568	581	
1095	ESTES RICHARD LEE	9	M	6	533	540	550	553	567	580		
1096	EWING VANA LEE	9	F	7	5	306	533	546	557	567	580	
1097	FARRIS TERRI GALE	9	F	6	533	553	564	567	577	580		
1098	FIELDS BARANDI EAYLE	9	F	6	530	531	533	557	567	580		
1099	FOX JEFFREY KENT	9	M	4	531	544	552	573				
1100	FRAUBIELE KIMBERLY	9	F	7	5	308	531	533	552	567	580	
1101	FRANCIS KIRK LELAND	9	M	6	533	548	553	559	567	580		
1102	FRANKS SHAWN E	9	M	6	530	531	533	552	567	580		
1103	FRANKLIN KERI ALLIS	9	M	7	19	308	531	533	553	567	580	
1104	FREEMAN JERRY THOM	9	M	7	23	308	533	553	559	567	580	
1105	FREEZE MARI	9	F	6	533	553	561	567	575	580		
1106	FRENSLEY JANE ELIZA	9	F	4	531	546	552	573				
1107	FROST JIMMY RAY	9	M	7	5	323	533	552	560	567	580	
1108	FRYAR REBECCA MARIE	9	F	6	534	557	564	568	575	581		
1109	GALLAHER THOMAS HER	9	M	4	531	552	573	575				
1110	GAMMON JANA LYN	9	F	4	546	558	573	575				
1111	GARDNER BRENDA KAY	9	F	3	546	564	570					
1112	GIADENS KIMBERLY RENAE	9	F	7	21	324	533	546	552	567	580	
1113	GILL DAVID ALLEN	9	M	6	533	548	550	552	567	580		
1114	GILL JIMMIE JEAN	9	F	6	531	533	551	552	567	580		
1115	GOAD SONAI LAVERNE	9	F	6	533	540	553	561	567	580		
1116	GORDON ERIC LINN	9	M	6	534	548	557	559	568	581		
1117	GRADY TOMMY JAMES	9	M	3	548	570	585					
1118	GRAY JAMES WARREN	9	M	6	531	534	548	557	568	581		
1119	GREEN CARL ALLEN	9	M	4	533	552	567	580				

1120	GRISHAM TERRY VAN	9	M	6	533	548	557	561	567	580	
1121	GRIZZLE GARY DAVID	9	M	7	8	323	530	534	557	568	581
1122	GRIZZLE RICK JOE	9	M	4	531	548	552	573			
1123	GROSE SUZANNE DICKI	9	F	5	19	320	538	552	573		
1124	GUINN LIA DAWN	9	F	7	19	320	533	557	564	567	580
1125	HAGGARD DERRICK WAY	9	M	7	16	308	534	553	559	568	581
1126	HALL BRENDA KAY	9	F	6	533	550	553	564	567	580	
1127	HALL JANICE MARIE	9	F	6	531	533	553	561	567	580	
1128	HALL LOUIS RAY	9	M	6	533	548	557	560	567	580	
1129	HALL ROBERT MATHEW	9	M	6	300	533	548	553	567	580	
1130	HAMES CHRISTIE HAYL	9	F	6	531	533	546	552	567	580	
1131	HAMES SHARON LYNN	9	F	6	531	534	546	557	568	581	
1132	HAMES STEVE LYNN	9	M	7	23	308	533	548	553	567	580
1133	HAMM BEVERLY F	9	F	4	533	552	567	580			
1134	HAMMON JERRY BRYCE	9	M	4	527	550	558	573			
1135	HARDCASTLE JACK	9	M	7	5	306	533	550	557	567	580
1136	HARDIN BILLY S	9	M	6	534	546	553	560	568	581	
1137	HART CHRISTIE E	9	F	6	531	533	550	553	567	580	
1138	HAWKINS BOBBY MICH	9	M	6	534	548	557	559	568	581	
1139	HAUSAM JAMES LESTER	9	M	6	323	531	534	553	568	581	
1140	HAWKINS NEAL RAY	9	M	6	531	533	548	553	567	580	
1141	HAYES JIMMY RAY	9	M	6	530	534	535	557	568	581	
1142	HEATON DONALD ALLE	9	M	6	24	530	533	552	567	580	
1143	HEBRON LUIS ALFONSO	9	M	4	551	552	559	573			
1144	HEDRICK JAMES ROBERT	9	M	6	534	548	557	560	568	581	
1145	HELMS FREDONNA LYNN	9	F	6	531	534	546	557	568	581	
1146	HENDERSON KELLY JAM	9	M	7	8	323	533	552	559	567	580
1147	HENDRICKS TERRY LYNNE	9	F	6	533	546	553	561	567	580	
1148	HENNING AMY LYNNE	9	F	5	5	324	531	553	573		
1149	HENSON GAVIN LEE	9	M	6	530	533	557	567	575	580	
1150	HENRY BUDDY LEE	9	M	6	534	535	548	557	568	581	
1151	HICKS CHERYL ANN	9	F	4	531	542	552	573			
1152	HICKSON DOUGLAS SCO	9	M	7	23	308	534	548	553	568	581
1153	HIGGINBOTHAM MAEIND	9	F	4	531	542	552	573			
1154	HOLLADAY DAVID RAND	9	M	4	531	552	573	575			
1155	HORNBACK JOHN PAUL	9	M	6	533	546	548	553	567	580	
1156	HORNBACK THOMAS DE	9	M	7	5	324	530	533	553	567	580
1157	HUDSON CHERYL KAY	9	F	4	533	552	567	580			
1158	HYDE MICHAEL LEE	9	M	6	534	548	557	568	578	581	
1159	JACKSON JAMES ALLEN	9	M	7	19	320	533	553	560	567	580
1160	JAMESON BOBBY J	9	M	7	5	324	534	557	559	568	581
1161	JAMESON DESIRA ANN	9	F	6	531	534	552	561	568	581	
1162	JENSEN GREG DEAN	9	M	6	24	533	548	552	567	580	
1163	JENNINGS KEN AUSTEN	9	M	6	533	548	552	559	567	580	
1164	JOHNSON COMMILLE LY	9	F	4	544	558	562	573			
1165	JOLLS FRANK A	9	M	4	531	550	552	573			
1166	JOHNSON VALERIE ANN	9	F	7	24	308	531	533	553	567	580
1167	JUAREZ KATHY L	9	F	6	534	546	557	568	578	581	
1168	KADRI BANU NORA	9	M	4	530	552	559	573			
1169	KARNPHAUS TRACY LYNN	9	F	7	8	324	533	538	552	569	580
1170	KERBY KENNETH DON	9	M	6	534	548	557	560	567	580	
1171	KIRBY DONALD WAYNE	9	M	6	534	548	557	568	578	581	
1172	KIVLER KENNETH	9	M	4	8	540	557	573			
1173	KNIGHT NORA KRISTINE	9	F	6	531	534	546	557	568	581	
1174	KONDONASSIS YOLANDA	9	F	5	19	324	538	558	573		
1175	KRAUSE BRAIN LEE	9	M	7	5	306	533	550	552	567	580
1176	KUHLMAN KATHY JOYC	9	F	4	546	550	552	573			
1177	LAMB CLINTON IKE	9	M	7	21	321	530	533	557	567	580
1178	LAMPRECHT SHERRY K	9	F	4	546	551	552	573			
1179	LANE BRIAN CODY	9	M	6	530	533	548	553	567	580	
1180	LANE KAREN KATHRYN	9	F	7	21	321	533	553	561	567	580
1181	LARKINS KELLY JOE	9	M	6	534	535	557	559	568	581	
1182	LARIMORE CHRISTINE	9	F	6	534	546	557	568	577	581	
1183	LAY JAMES TODD	9	M	6	530	531	533	557	567	580	
1184	LAZALIER KRISTEN AN	9	F	7	21	321	533	550	557	567	580
1185	LEONARD PEGGY LYNN	9	F	4	531	551	552	573			

1186	LEPPERT LYNDA LOUIS	9	F	4	550	558	561	573			
1187	LEWIS MARK ALAM	9	M	6	19	530	533	553	567	580	
1188	LIBERTY STUART SPEN	9	M	6	530	533	553	559	567	580	
1189	LOCKE CARLENE RHAE	9	F	5	24	316	538	552	573		
1190	LOVEDAY BILLIE LAV	9	F	4	531	552	573	575			
1191	LOUINS EARL DEAN	9	M	6	8	534	557	560	568	581	
1192	LUNDY KIMIKO M	9	F	4	533	552	567	580			
1193	LYLES KARLA KAY	9	F	6	534	535	546	557	568	581	
1194	MAHANES KIMBERLY ANN	9	F	6	533	546	552	564	567	580	
1195	MARTIN KATHY DIANE	9	F	6	530	534	557	564	568	581	
1196	MARTIN MARK	9	M	6	534	557	559	566	578	581	
1197	MAST PAULA SUE	9	F	5	5	308	531	552	571		
1198	MASTERS DONNA MARIE	9	F	6	530	533	557	567	578	580	
1199	MCCAIN LINDA LEA	9	F	6	533	546	552	561	567	580	
1200	MCCULLOM JANNINE SUE	9	F	6	530	533	540	552	567	580	
1201	MCCOOL RICHARD IVY	9	M	6	533	552	559	567	575	580	
1202	MCCRACKEN GLENDA KE	9	F	6	533	551	557	561	567	580	
1203	MCCRAY PHYLLIS LYNN	9	F	7	21	321	533	557	567	575	580
1204	MCCURLEY GREGORY N	9	M	6	533	540	548	557	567	580	
1205	MC GARITY JOE	9	M	6	530	533	550	553	567	580	
1206	MCKENZIE DONNA SUE	9	F	5	8	324	550	552	573		
1207	MCLEHANEY TOMMY	9	M	6	533	540	548	553	567	580	
1208	MCMILLEM PAUL GENE	9	M	6	531	533	557	567	575	580	
1209	MEEKS PAT DAVID	9	M	6	533	550	552	559	567	580	
1210	MEINERS BOBBY CARL	9	M	4	5	307	570	575			
1211	MELTON TROY	9	M	6	534	548	557	559	568	581	
1212	MEYER WILLIAM PAUL	9	M	6	534	548	557	568	578	581	
1213	MILLER ROSA DIANA	9	F	6	531	534	546	557	568	581	
1214	MILLER TRACY SCOTT	9	M	6	533	548	557	560	567	580	
1215	MITCHELL BRAIN LEE	9	M	6	534	548	553	560	568	581	
1216	MITCHUM CINDY	9	F	6	534	550	557	564	568	581	
1217	MITCHELL JANICE FAY	9	F	6	531	534	557	564	568	581	
1218	MITCHELL LEE ANN	9	F	6	531	534	546	553	567	580	
1219	MITTON DIANNE MARI	9	F	6	21	531	534	557	568	581	
1220	MOORE IVAN RAY	9	M	6	533	548	552	559	567	580	
1221	MONTGOMERY GLENN ALLEN	9	M	6	534	550	557	560	568	581	
1222	MOORE JAMIE LOUISE	9	F	4	530	546	552	573			
1223	MOORE TOMMY GUY	9	M	6	533	548	552	559	567	580	
1224	MORRIS HOLLY JEAN	9	F	7	8	305	531	533	553	567	580
1225	MORRISON CYNTHIA	9	F	6	531	533	552	567	578	580	
1226	MORRISON BICKY DALE	9	M	7	5	323	534	548	557	568	581
1227	MYERS GREGORY GID	9	M	4	531	558	559	573			
1228	NEAL GLENN MITCELL	9	M	7	8	323	533	548	552	567	580
1229	NELSON ROBRET NATHAN	9	M	6	533	548	552	559	567	580	
1230	NEWEY TERRY LYNN	9	M	6	531	533	553	564	567	580	
1231	NEWTON JEFF ALLEN	9	M	6	534	551	553	559	568	581	
1232	NOLAN SONYA MICHELL	9	F	7	21	321	531	533	553	567	580
1233	ODAM DAVID JEROME	9	M	6	530	533	538	557	567	580	
1234	OWEN JEFFERY	9	M	6	530	533	540	553	567	580	
1235	OWEN JOANNA L	9	F	7	21	321	533	546	553	567	580
1236	PARKS WADE ALLEM	9	M	6	530	533	538	552	567	580	
1237	PARNELL CHARLENE ELLEN	9	F	6	531	533	553	561	567	580	
1238	PEERY DEANNA LYNN	9	F	6	531	533	557	564	567	580	
1239	PERSONS JEANNE ANNE	9	F	5	19	320	552	573	577		
1240	PESHEL ROBERT LEE	9	M	7	60	324	534	535	557	568	581
1241	PETERSON JAMES BLAK	9	M	6	534	548	557	559	568	581	
1242	PETTYS DEBRA ANN	9	F	6	533	552	562	567	577	580	
1243	PLUARNIK MIKEL	9	M	6	5	533	548	553	567	580	
1244	PHAM GIAO NGOC	9	M	5	7	323	552	559	573		
1245	PIERCE MAX RAY	9	M	5	8	316	558	559	573		
1246	PIGG DEBORAH LEANN	9	F	5	24	308	558	564	573		
1247	POLASEK TIM P	9	M	6	530	533	548	552	567	580	
1248	POWELL KENNY DAVID	9	M	6	533	544	548	557	567	580	
1249	PRICE KIMBERLY SUE	9	F	6	534	546	553	561	568	581	
1250	PRIMROSE JOHN GREGO	9	M	4	531	558	559	573			
1251	PROCTOR JOSEPH CLYD	9	M	6	533	552	560	567	578	580	

1252	PUCKETT J LYNNETTE	9	F	6	531	533	553	564	567	580		
1253	QUINTON STANLEY GEN	9	M	4	531	550	552	573				
1254	RAINER JEFFREY SCOT	9	M	5	23	308	558	559	573			
1255	RANEY HOWARD JAMES	9	M	7	5	323	534	551	557	568	581	
1256	RANEY JULIE ESTHER	9	F	5	19	320	531	552	573			
1257	REA JACK TRACY	9	M	8	5	23	306	324	534	557	568	581
1258	REDCORN YANCEY GAR	9	M	4	550	552	561	573				
1259	REDMON LISA ANN	9	F	6	530	533	557	567	577	580		
1260	REICH RONNIE DEAN	9	M	6	530	533	553	559	567	580		
1261	REICH RONNIE DEAN	9	M	6	530	533	553	559	567	580		
1262	REID LAURA ALLENE	9	F	6	533	542	553	567	575	580		
1263	REID MICHAEL FORRES	9	M	4	548	551	558	573				
1264	RHEA LISA ANN	9	F	6	533	552	564	567	577	580		
1265	RILEY TERESA DALE	9	F	4	531	538	553	573				
1266	RINGWALD JOHN ALLEN	9	M	6	531	534	538	557	568	581		
1267	ROBERTS GORDON CLIFFORD	9	M	6	534	535	557	559	568	581		
1268	ROBERSON BETH	9	F	6	531	533	553	561	567	580		
1269	ROBERTS PETER NICH	9	M	7	19	320	533	538	553	567	580	
1270	ROCKETT TAMMY K	9	F	6	531	534	551	557	568	581		
1271	ROGERS JASON LEWIS	9	M	6	533	540	557	560	567	580		
1272	ROLLER GERRI LYNN	9	F	6	24	533	550	552	567	580		
1273	RUSSELL GORDON PAUL	9	M	6	531	533	548	557	567	580		
1274	RUSSELL MITCH RAY	9	M	4	5	306	570	585				
1275	SANDERS CERRY JEAN	9	F	6	531	533	553	561	567	580		
1276	SANDERS JOHN JOSEPH	9	M	6	530	533	540	553	567	580		
1277	SANDERS LOWANNA MA	9	F	7	8	305	531	533	553	567	580	
1278	SCHLIENZ DARLEENA S	9	F	6	534	546	557	564	568	580		
1279	SCHNERINGER S RENEE	9	F	7	5	324	531	533	552	567	580	
1280	SETTLE DAVID HARRY	9	M	6	533	544	553	559	567	580		
1281	SETTLE FRED WESLEY	9	M	6	533	544	553	559	567	580		
1282	SHAFFER SHERRY KATH	9	F	7	5	324	533	557	561	567	580	
1283	SHAVER DONNA CAROL	9	F	6	533	553	564	567	577	580		
1284	SHAW DONALD RAY	9	M	7	8	316	533	548	553	567	580	
1285	SHAW ROBERT WAYNE	9	M	6	533	548	557	560	567	580		
1286	SHEARER KATHY ANN	9	F	5	5	324	550	552	573			
1287	SHELL JUDY ANN	9	F	6	531	533	553	567	577	580		
1288	SHERIDAN LYNDA KAYE	9	F	7	5	324	533	546	553	567	580	
1289	SHINERT THERESA LOU	9	F	6	533	553	561	567	577	580		
1290	SIMONS HAROLD ALLEN	9	M	7	5	306	534	548	553	568	581	
1291	SIMS SHANNON DEE	9	F	4	533	552	567	580				
1292	SMITH FLOYD ALLEN	9	M	7	23	308	533	548	552	567	580	
1293	SMITH KIMBERLY ANN	9	F	6	534	557	562	568	577	581		
1294	SMITH STEVEN CHARLE	9	M	6	533	548	553	559	567	580		
1295	SMITHSON FRANKLIN DELANA	9	M	6	530	533	542	552	567	580		
1296	SHELL ALATHEA JOY	9	F	5	544	552	573	577	580			

*** INFEASABLE REQUEST LIST ***

1297	SPINK PAUL SANKER	9	M	4	533	552	567	580				
1298	SPOR LISA ANN	9	F	4	531	546	552	573				
1299	STACY BRET WAYNE	9	M	6	533	548	552	559	567	580		
1300	STAUBER MORGEN GLAR CLAR	9	F	6	531	533	546	557	567	580		
1301	STEPHENS CAROL LOUI	9	F	6	530	534	546	557	568	581		
1302	STJOHN MATTHEW CARI	9	M	6	533	548	553	559	567	580		
1303	STRATTON BRADLEY DO	9	M	7	19	308	533	557	559	567	580	
1304	STRAUGHN JOY LYN	9	F	5	24	308	531	552	573			
1305	TALBOT DAVID	9	M	6	534	548	557	559	568	581		
1306	TATE STEVEN BLAIR	9	M	7	5	323	534	553	560	568	581	
1307	TAYLOR TODD NOLAN	9	M	6	533	548	553	559	567	580		
1308	TILLER SHARLA ELAIN	9	F	4	531	552	561	573				
1309	TOWNLEY ELLEN ELIZA	9	F	6	531	533	551	552	567	580		
1310	TUCCI LOUIS JOHN	9	M	6	533	544	552	559	567	580		
1311	TULLIUS BETTY JANE	9	F	4	530	558	561	573				
1312	TURNER JEFF MICHAEL	9	M	7	5	324	534	546	557	568	581	
1313	UNDERWOOD TERRY LEE	9	M	7	5	324	534	548	553	568	581	
1314	UPTEGRAFT NATHAN KR	9	M	4	531	552	559	571				
1315	URDAHL RICHARD D	9	M	5	21	321	552	559	573			
1316	VALOUCH JANIE LOUIS	9	F	6	24	308	531	533	553	580		

1317	VANDERHELM MICHAEL	9	M	6	533	538	553	560	567	580	
1318	VANNASTRAM DARLA DE	9	F	7	19	321	533	552	567	577	580
1319	VESELY STEVEN MORE	9	M	5	24	308	553	559	573		
1320	VIS DANIEL RAYMOND	9	M	4	24	531	558	573			
1321	WAGGONER FRANK GREG	9	M	6	534	535	548	553	568	581	
1322	WAGNER MARY MARGARET	9	F	4	531	558	561	573			
1323	WALKER CHARLES EUGENE	9	M	6	530	533	553	560	567	580	
1324	WALKER KENT LEE	9	M	7	5	306	533	552	559	567	580
1325	WALTNER KELLY ANN	9	F	4	531	558	561	573			
1326	WARDIUS GEORGE SCOT	9	M	4	548	558	559	573			
1327	WARREN PAUL EUGENE	9	M	6	533	557	560	567	578	580	
1328	WEAVER RANDAL SCOTT	9	M	5	24	323	540	558	573		
1329	WEBB WARREN DOUGLAS	9	M	6	533	548	552	560	567	580	
1330	WEBER KARL BERNARD	9	M	7	5	324	533	557	560	567	580
1331	WEED TINA MARIE	9	F	6	530	534	546	557	568	581	
1332	WEIRICH AMY LOUISE	9	F	6	531	533	558	564	567	580	
1333	WESNER JACOB C	9	M	6	16	19	308	320	558	573	
1334	WHEELER BRAD LEE	9	M	7	23	308	530	534	557	568	581
1335	WHEELER KEVIN SCOT	9	M	7	5	306	533	552	559	567	580
1336	WHITE SHEILA KAY	9	F	6	531	534	538	557	568	581	
1337	WHITE MARE S EDWARD	9	M	6	534	551	557	567	575	580	
1338	WIGGINS RONNIE G	9	M	6	534	535	548	557	568	581	
1339	WILKINSON E CHARLES	9	M	6	530	533	553	559	567	580	
1340	WILLCOX TIOMMIE JOE	9	M	6	5	534	544	557	568	581	
1341	WILLIAMS MICHELLE D	9	F	6	531	533	553	561	567	580	
1342	WILLIAMS ROBYN LEE	9	F	7	5	308	531	533	553	567	580
1342	WILLIAMS ROBGN LEE	9	F	7	5	308	531	533	553	567	580
1343	WILLIAMS SCOTTIE RA	9	M	7	8	324	534	548	553	568	581
1344	WITCHER JAMES CHRISTOPHER.	9	M	7	8	323	533	548	552	567	580
1345	WOLF KIM RENEE	9	F	7	5	308	531	533	553	567	580
1346	WOLVERTON LISA ANN	9	F	6	534	557	564	568	575	581	
1347	YATES LARRY TODD	9	M	6	533	544	557	559	567	580	
1348	YOUNG JOE ARVINE	9	M	4	534	557	568	580			
1349	YOUNG MARK GREGORY	9	M	6	530	531	533	552	567	580	
1350	YOUNG VAN	9	M	6	534	548	557	560	568	581	
1351	ZANOLA TONI DENISE	9	F	6	533	553	564	567	577	580	
1352	ZASTE MARLIN	9	M	7	5	306	534	557	560	568	581
1353	ZIBOLSKY SUZANNE	9	F	7	21	321	531	533	552	567	580
1354	ZIMMER RICKY DEAN	9	M	3	548	570	585				
1355	MCDEVITT DOLAN JAM	9	M	6	531	534	538	553	568	581	
2001	AKIN PATRICIC SUE	10	F	7	12	309	537	538	558	561	569
2002	ALEXANDER O LORNA GAI	10	F	7	8	309	531	537	558	565	569
2003	ALINGER DANIEL SCOT	10	M	7	23	309	533	549	556	565	569
2004	ALLISON JALYN DENIS	10	F	4	539	551	558	571			
2005	AMOS DENISE ANN	10	F	2	556	571					
2006	ANDERSON ROEBERT MIC	10	M	7	12	309	537	558	559	565	569
2007	ARGO MICKEY E	10	M	7	8	323	537	558	559	565	569
2008	ARMSTRONG JAMI JOI	10	F	4	309	539	558	571			
2009	AUGHTRY JONNIE LYNN	10	F	7	12	309	537	558	561	565	569
2010	AVILES RICHARD	10	M	3	8	305	572				
2011	BAADE JIMMY	10	M	6	530	537	549	556	566	569	
2012	BABB THOMAS EDWARD	10	M	6	16	557	560	565	569	575	
2013	BABCOCK SHARI LYNN	10	F	6	9	531	537	552	565	569	
2014	BACHARCH CASSIE LAA	10	F	5	21	309	539	558	571		
2015	BACON RANDALL DEWAY	10	M	7	24	309	537	558	559	565	569
2016	BAIRD ROBERT MARC	10	M	7	9	308	537	556	560	566	569
2017	BAKER DAVID SHAWN	10	M	7	24	309	537	552	559	565	569
2018	BANKS RENITA FAYE	10	F	5	16	309	531	567	572		
2019	BARKSDALE GARY LYNN	10	M	7	9	323	537	544	552	565	569
2020	BARNARD MARVIN WAYNE	10	M	5	9	317	548	566	572		
2021	BARNETT ROBERT DALE	10	M	4	309	567	572	578			
2022	BATES SCOTTY NOLAN	10	M	5	5	309	566	572	578		
2023	BELKNAP HAL R	10	M	6	537	538	558	560	565	569	
2024	BELYEA DAVID J	10	M	5	9	308	549	558	571		
2025	BENTON CHRIS STEPH	10	M	7	9	323	537	550	558	565	569
2026	BEVILLS RUSSELL WAY	10	M	5	9	316	560	566	572		

2027	BLACK BECKY LYNDELL	10	F	5	16	309	561	566	572			
2028	BLAYLOCK DONNA LOU	10	F	7	23	309	537	556	566	569	575	
2029	BLAYLOCK KARLA K	10	F	4	309	550	558	571				
2030	BELVINS ALICIA MAE	10	F	4	541	558	571	575				
2031	BOGGS KELLIE JO	10	F	5	9	305	539	558	571			
2032	BOND CORINA L	10	F	5	5	309	531	564	572			
2033	BOONE BRIAN KEITH	10	M	7	23	309	537	558	560	565	569	
2034	BOWEN RICHARD	10	M	5	9	305	308	323	572			
2035	BOX MICHAEL ALBERT	10	M	7	23	309	537	549	552	565	569	
2036	BRESHEARS DONNA SUE	10	F	5	9	316	531	566	572			
2037	BRITT RENA KAY	10	F	7	21	309	532	537	556	565	569	
2038	BROWN JEANETTE CARO	10	F	7	9	308	537	556	565	569	575	
2039	BROWN MELODY ANN	10	F	7	9	305	537	556	565	569	575	
2040	BROENLEE MARQUETTA	10	F	7	24	309	537	556	565	569	577	
2041	BRAYANT DANA CARLO	10	F	7	19	309	537	550	558	565	569	
2042	BRAYANT DARREL JAMES	10	M	6	534	535	557	560	568	581		
2043	BURGETT WILMA JEAN	10	F	5	9	305	544	566	572			
2044	BUSSEY TERRY LYNN	10	M	6	9	537	549	556	565	569		
2045	BUTLER DANNY JO	10	M	7	9	305	537	558	559	565	569	
2046	BUTLER GLENNA JEAN	10	F	5	23	309	532	558	571			
2047	BYRD BARBARA MARIE	10	F	6	531	537	556	565	569	579		
2048	CAMPHELL KIMBERLY R	10	F	7	9	308	537	558	565	569	577	
2049	CAPE CHESTER DEWAYN	10	M	7	8	309	537	552	559	565	569	
2050	CARPENETR DAVID M	10	M	5	21	309	566	572	580			
2051	CARSON DAN WALLACE	10	M	6	531	537	556	565	569	575		
2052	CARTER JOHN CHRIS	10	M	5	17	309	566	572	579			
2053	CARY DAVID A	10	M	5	9	540	550	558	571			
			*** INFEASABLE REQUEST LIST ***									
2054	CASH CARLENE'D	10	F	5	5	324	562	566	572			
2055	CAVES LISA MARIE	10	F	6	531	537	558	565	569	575		
2056	CHRISTIAN IAN MARK	10	M	4	537	550	555	559				
2057	CLAEYS CAROL GAIL	10	F	7	7	323	537	556	561	566	569	
2058	CLARK LURRIE	10	F	7	9	324	537	556	561	565	569	
2059	CLARK TRACY LEIHGH	10	M	7	7	309	537	539	558	565	569	
2060	CLEAR KEAL WAYNE	10	M	6	17	309	556	559	567	569		
2061	CLINKENBEARD LISA J	10	F	5	531	546	558	571	575			
			*** INFEASABLE REQUEST LIST ***									
2062	CLASON LISA ANNETTE	10	F	7	8	309	537	550	552	567	569	
2063	COLWELL STEVE ED	10	M	7	24	309	537	558	559	565	569	
2064	COMPTON STEVEN SC	10	M	4	309	549	566	572				
2065	CONNER MICHAEL STEVE	10	M	7	8	309	537	552	559	565	569	
2066	COSSEY TIM J	10	M	5	5	317	560	565	572			
2067	COUCH STEVEN DALE	10	M	7	9	305	537	558	559	565	569	
2068	COX ANNETTE	10	F	5	309	324	558	564	571			
			*** INFEASABLE REQUEST LIST ***									
2069	CRAIG BRENDA ANN	10	F	5	8	309	550	556	571			
2070	CRAIG TWESSIE ROSS	10	F	4	539	551	558	571				
2071	CRANDELL ROBERT D	10	M	4	559	566	572	578				
2072	CROWN MARC NOWARD	10	M	7	9	308	537	558	559	565	569	
2073	CURRY SHARON KAYE	10	F	3	567	572	580					
2074	DANG NGUYET MINH	10	F	7	7	309	537	539	552	565	569	
2075	DANIEL BARBARA ELAINE	10	F	4	531	566	572	575				
2076	DANIEL RON DALE	10	M	7	19	309	537	558	559	565	569	
2077	0 DAVIS BRENDA KAE	10	F	8	16	24	308	309	537	552	565	569
2078	DAVIS DEE ANN	10	F	4	9	325	570	575				
2079	DAVIS MELODY ANN	10	F	6	9	531	537	558	565	569		
2080	DAVIS REGINA	10	F	5	7	537	553	565	569			
2081	DAWSON DEBRA LYNN	10	F	5	9	316	531	558	571			
2082	DETTAVEN ROSANNA MAR	10	F	7	9	305	537	552	561	565	569	
2083	DEHN TERRI LYNN	10	F	6	9	537	550	556	565	569		
2084	DELAUGHTER JOHN	10	M	4	530	543	558	571				
2085	DELHEIMER THOMAS STEVEN	10	M	6	9	537	549	556	565	569		
2086	DENSMORE TERESA JO	10	F	6	531	537	552	564	565	569		
2087	DELVERS JOHN	10	M	5	8	537	548	565	569			
2088	DIERS GANE G	10	M	4	9	550	558	571				
2089	DONALDSON WES SCOTT	10	M	6	9	537	556	565	569	579		

2090	DOYLE TRACY EUGENE	10	M	6	309	537	556	565	569	579		
2091	DRAUGHN DANNY RAY	10	M	4	548	559	566	572				
2092	DRISKELL CINDY LEN	10	F	7	12	309	537	550	558	569	577	
2093	DISWELL KARLA ANN	10	F	8	23	24	309	316	537	556	567	569
2094	DUMP TAMMY GAIL	10	F	7	12	309	537	550	558	565	569	
2095	DURHAM KELLY ELIZA	10	F	5	12	309	558	571	575			
2096	DURKEE GARY RHEA	10	M	6	531	537	541	552	565	569		
2097	DUVALL MICHAEL LEE	10	M	6	309	545	552	559	565	569		
2098	EADES DORIAN SUE	10	F	4	9	532	566	571				
2099	EDINGTON GARD DON	10	M	5	21	309	558	559	571			
2100	ELLIOT LORI N	10	F	4	9	325	547	570				
2101	FIELDS JEFFREY ALAN	10	M	6	309	537	549	558	565	569		
2102	FISHBECK LESLIE MA	10	F	6	8	309	532	551	558	571		
			*** INFEASABLE REQUEST LIST ***									
2103	FISHER LAWRENCE MIC	10	M	6	8	309	550	558	559	571		
			*** INFEASABLE REQUEST LIST ***									
2104	FLOYD BRAIN	10	M	4	9	305	570	585				
2105	FOWLER TOMMY RAY	10	M	7	21	309	537	556	565	569	575	
2106	FRAYAR WILLIAM LEE	10	M	4	9	305	570	585				
2107	GAGE SHELLEY DIANA	10	F	7	9	308	537	564	565	569	575	
2108	GASS LOUISE ALMA	10	F	6	532	537	556	565	569	578		
2109	GATES RONALD JAY	10	M	6	537	541	551	556	565	569		
2110	GENTRY COLIN LYNN	10	M	7	23	309	537	550	558	565	569	
2111	GHASEMI NAFISEH	10	F	6	9	537	538	556	566	569		
2112	GIBBONS MELISSA DEA	10	F	5	9	308	531	558	571			
2113	GOAD MICHAEL	10	M	2	566	572						
2114	GRADY HAROLD WAYNE	10	M	4	9	585	548	570				
			*** INFEASABLE REQUEST LIST ***									
2115	GRAF KARIE MARIE	10	F	7	9	308	537	558	565	569	575	
2116	GREEN KENNY JOE	10	M	6	537	549	552	565	569	579		
2117	GRAFFIN ANNA CECIL	10	F	7	8	309	537	552	565	569	575	
2118	GROVE GLORIA	10	F	6	535	537	556	566	569	577		
2119	HAAS LORI MICHELE	10	F	5	12	309	550	558	571			
2120	HAMBY ROSS RANDALL	10	M	7	7	309	537	548	556	565	569	
2121	HAMILLTON DICK H	10	M	7	5	309	537	544	549	558	569	
2122	HANGER STEVEN HUGO	10	M	7	7	309	537	545	558	566	569	
2123	HANSMEYER TODD EUGE	10	M	6	537	552	565	569	575	579		
2124	HARDEN KAREN KYM	10	F	4	309	531	558	571				
2125	HARDMAN MELEIA LYNN	10	F	5	24	309	525	558	571			
2126	HARKEY BEVERLY LOUI	10	F	6	532	537	556	564	565	569		
2127	HARRI PATRICK	10	M	7	7	309	533	556	560	565	569	
2128	HARRIS HAREN	10	F	7	24	317	537	556	564	565	569	
2129	HARRIS SHERRY JANE	10	F	4	550	558	561	571				
2130	HARRIS JERRY HOWARD	10	M	4	531	551	558	571				
2131	HART TERRI ALANA	10	F	5	9	308	550	556	571			
2132	HARTMAN RAYMOND EAR	10	M	6	537	549	552	565	569	575		
2133	HAUSAM BETTY JEAN	10	F	7	24	309	531	537	556	565	569	
2134	HEARD STEVEN ISAAAC	10	M	7	60	309	537	552	565	569	575	
2135	HEITZ MARCIE LYNN	10	F	7	9	364	537	546	556	565	569	
2136	HELMIT KATHI LYNN	10	F	5	23	309	551	566	572			
2137	HENDRICKS LINDA MAR	10	F	7	5	323	531	537	556	565	569	
2138	HENNINGS BILL ALEX	10	M	7	23	309	537	549	556	565	569	
2139	HENSLEE BILLYE G	10	F	4	537	556	565	569				
2140	HEWITT LISA ANN	10	F	5	24	309	532	558	571			
2141	HICKS JIMMY	10	M	5	9	323	549	566	572			
2142	HODSON DAVID MICHA	10	M	4	539	558	559	571				
2143	HOLMAN STEVEN DONAL	10	M	4	525	558	559	571				
2144	HOPKINS KAREN DENIS	10	F	5	8	309	558	571	578			
2145	HORN BECKY DEEANNE	10	F	7	9	324	537	552	565	569	575	
2146	HORNBACK LISA ANN	10	F	4	550	556	561	571				
2147	HOSKINSON	10	F	5	24	399	562	566	572			
2148	HOWLAND KATHLEEN AN	10	F	7	24	309	537	558	561	565	569	
2149	HUGHES DANIEL	10	M	7	9	308	535	549	556	568	569	
2150	HUGHES DOW RAY	10	M	5	12	309	558	559	571			
2151	HUGHES JOHN CHARLES	10	M	6	8	16	309	324	566	572		
2152	HUNT CARRIE BETH	10	F	6	531	537	538	558	569	577		

2153	HUNTER BEN	10	M	6	537	548	556	565	569	579		
2154	HUNTER BOBBY LYNN	10	M	4	537	556	566	569				
2155	INGELS CAROL SUSANN	10	F	6	537	543	550	558	565	569		
2156	IRWIN ROBERT LOUIS	10	M	6	19	309	541	550	558	571		
			*** INFEASABLE REQUEST LIST ***									
2157	JACOBS JUDY LYNN	10	F	7	16	17	21	308	531	552	564	
2158	JAMAR ROSEMARY CARO	10	F	7	16	309	537	551	552	565	569	
2159	JENNINGS SHEILA Z	10	F	7	9	305	531	537	558	565	569	
2160	JESSOP SAMUEL ZANE	10	M	4	549	560	566	572				
2161	JEWELL ALUCE V	10	F	8	5	8	309	323	537	556	565	569
2162	JOHNSON PATTY JANN	10	F	7	9	306	531	537	556	565	569	
2163	JOHNSON SPENCER COLE	10	M	6	537	542	558	559	565	569		
2164	JONES KENT MARUICE	10	M	7	60	309	537	556	565	569	578	
2165	JOHNSON MARK	10	M	7	16	308	531	537	558	565	569	
2166	JONES JERRI LYNN	10	F	6	530	537	539	556	565	569		
2167	KEITH LELIA SHELLY	10	F	7	9	324	537	556	564	565	569	
2168	KELLEY LADONNA SUE	10	F	7	9	338	530	537	556	565	569	
2169	KENNEDY GEWEN ELAINE	10	F	7	21	308	537	551	556	565	569	
2170	KENNEDY LEA ANN	10	F	4	532	538	552	571				
2171	KERBY KARI DAWN	10	F	7	25	309	537	552	565	569	575	
2172	KERR KIMBERLY ANNE	10	F	6	531	537	552	561	565	569		
2173	KERSEY TONY DALE	10	M	6	531	537	558	565	569	579		
2174	KESLER CYNTHIA ANN	10	F	5	9	324	532	558	571			
2175	KLIMA CRAIG W	10	M	7	5	309	537	558	559	565	569	
2176	KLIMA CRAIG W	10	M	7	5	309	537	558	559	565	569	
2177	KYURIGER SHARON LOUI	10	F	7	9	537	543	550	558	565	569	
			*** INFEASABLE REQUEST LIST ***									
2178	LACK PAUL EDWARD	10	M	7	9	308	537	544	558	565	569	
2179	LANDRY SHERRY LYNN	10	F	7	24	309	537	556	564	565	569	
2180	LANE COLLEEN ANN	10	F	6	537	545	552	565	567	569		
2181	LANGE KIMBERLY ELA	10	F	5	8	309	538	558	571			
2182	LASATER TERRY D	10	M	7	8	309	537	556	565	569	575	
2183	LAWRENCE LISA GAILE	10	F	6	530	537	556	565	569	575		
2184	LEMONS TONY COLE	10	M	7	9	317	533	552	560	565	569	
2185	LESSLY MARK EDWARS	10	M	7	7	323	537	557	559	565	569	
2186	LEWIS DANE D	10	M	4	549	556	560	572				
2187	LOEWEN JANICE MARIE	10	F	4	531	544	558	571				
2188	LOVINS DONNA JO	10	F	7	9	399	537	552	561	565	569	
2189	LOYD VICKI ANNETTE	10	F	6	531	537	552	565	569	575		
2190	LUCAS MARY ELIZABETH	10	F	4	9	305	547	570				
2191	LUMPKINS JONATHAN R	10	M	4	531	549	555	571				
2192	LUNDY DAPHNE LOU	10	F	5	9	308	550	558	571			
2193	LYNN DONALD B	10	M	5	9	323	558	559	571			
2194	LYONS JILL M	10	F	8	8	24	305	309	537	556	565	569
2195	LYONS JILL M	10	F	5	537	556	561	565	569			
2196	MANGUS DEBBIE LYNN	10	F	7	9	308	537	556	565	569	579	
2197	MANNJING JAY DEE	10	M	4	549	560	566	572				
2198	MASTERS KAEN ANN	10	F	5	12	309	558	561	571			
2199	MAULDIN PATRICIA M	10	F	5	9	308	531	566	572			
2200	MAYBERRY LANDA DAW	10	F	4	538	555	561	571				
2201	MAYES CYNTHIA ANNE	10	F	6	525	537	556	564	565	569		
2202	MAYES KELLY MICHELLE	10	F	6	530	532	537	552	565	569		
2203	MCALISTER ROBIN CLA	10	F	5	8	309	558	559	571			
2204	MCCARREL TAMMY LYN	10	F	6	537	557	564	565	569	575		
2205	MCCAUGHTRY DARR LYN	10	F	6	531	537	552	564	565	569		
2206	MCCLELLAN MITCH GAR	10	M	5	9	360	549	566	572			
2207	MCDONALD BRYAN WAYN	10	M	7	9	308	537	558	559	565	569	
2208	MCGRATH JENNIE KAY	10	F	4	530	564	565	572				
2209	MCKINZIE LINDA KAY	10	F	7	5	309	531	537	556	565	569	
2210	MCNUTT JIMMY RAY	10	M	7	9	308	537	550	558	565	569	
2211	MEADOWS SHAWNA GAY	10	F	5	9	324	532	558	571			
2212	MEISSNER PATRICIA L	10	F	7	9	308	532	537	558	565	569	
2213	MESSERLE SUSANNE B	10	F	4	531	544	558	571				
2214	MEYER DENISE KAE	10	F	8	7	9	305	325	531	537	556	569
2215	MERYER DONNA RAE	10	F	7	9	325	530	532	537	552	569	
2216	MEYER JODIE LEANN	10	F	5	9	324	531	537	572			

2217	MILLER DAVID RAY	10	M	7	24	309	537	558	559	565	569
2218	MILLER JAMES M	10	M	6	531	537	558	559	565	569	
2219	MITCHELL RICK ALLEN	10	M	7	24	309	537	556	560	565	569
2220	MITTEN LORI ANNE	10	F	7	12	309	532	537	558	565	569
2221	MIZE VALERIE JEAN	10	F	4	547	566	572	577			
2222	MONTAYNE ROBIN N	10	F	7	9	325	537	556	569	575	577
2223	MONTGOMERY DA K	10	M	7	9	323	530	537	556	565	569
2224	MONTGCMERY SHELIA L	10	F	6	537	543	558	565	569	577	
2225	MOORE KEVIN WADE	10	M	5	60	309	549	558	571		
2226	MORREN THOMAS R	10	M	7	7	309	537	552	559	565	569
2227	MOSES DARRYL	10	M	7	16	309	537	556	559	565	569
2228	MURPHY CYNTHIA ANN	10	F	5	9	361	545	558	571		
2229	MUSGRAVE SHERRI LYN	10	F	7	62	309	537	550	558	565	569
2230	MYERS NANCY DARLENE	10	F	6	532	537	550	558	565	569	
2231	NEFF MARY ANN	10	F	7	9	323	537	552	565	569	575
2232	NELMS BRENT RUSSELL	10	M	5	8	309	559	572	578		
2233	NEWBERG GREG	10	M	2	566	572					
2234	NEWTON KARI LISA	10	F	4	558	564	571	577			
2235	NICKERSON DOUGLAS A	10	M	7	59	309	537	550	552	565	569
2236	NOTTENSMEYER EVELYN	10	F	5	8	309	531	566	572		
2237	OBERMILLER MARK GUN	10	M	5	8	309	558	559	571		
2238	ODOM ANGELA G	10	F	7	9	316	537	547	552	565	569
2239	OLIPHANT MELISSA JA	10	F	7	21	309	537	558	564	565	569
2240	ORTH DANIEL LEO	10	M	7	9	324	537	552	559	565	569
2241	PATTERSON LARRY E	10	M	7	9	308	537	552	560	565	569
2242	PAYNE PAMELA J	10	F	5	9	308	532	567	572		
2243	PEACE ROBERT WAYNE	10	M	7	9	308	537	549	552	565	569
2244	PELLEY KATHERYNE R	10	F	6	9	308	531	551	558	571	
	*** INFEASABLE REQUEST LIST ***										
2245	PHILLIPAS SUSAN LYNN	10	F	5	19	309	566	572	578		
2246	PLASTER SHELLY LYN	10	F	7	9	308	537	556	565	569	578
2247	POLK DAVID DWAIN	10	F	7	8	323	537	552	559	565	569
2248	POTTS JERRY	10	M	2	566	572					
2249	POTTS LORI L	10	F	7	64	309	532	537	552	565	569
2250	POWELL JAMIE W	10	M	6	537	549	556	565	569	579	
2251	PRIDEMORE CAROLYN G	10	F	7	9	308	537	558	559	565	569
2252	PUGH GREGORY WILLIAM	10	M	7	24	309	537	544	558	565	569
2253	RAEL ORLANDO FRANCIS	10	M	7	6	305	531	537	558	565	569
2254	RAMAY RUSSELL C	10	M	5	8	399	560	572	579		
2255	RAMSEY TODD M	10	M	6	537	544	550	558	565	569	
2256	RANEY JOHN DAVID	10	M	7	7	309	537	551	556	565	569
2257	REED SHELLEY LYNN	10	F	6	537	556	564	565	569	577	
2258	REID NATFAN LINN	10	M	7	19	309	537	543	550	552	569
2259	REYNOLDS DALE C	10	M	6	531	537	549	558	565	569	
2260	REYNOLDS ERIC EUGEN	10	M	7	16	309	530	537	558	565	569
2261	REYNOLDS RALPH THOM	10	M	7	24	309	537	556	559	565	569
2262	RICHARDSON JANEY	10	F	5	12	309	558	564	571		
2263	RIDGE WAY BURNEY GENE	10	M	5	8	309	559	572	578		
2264	RIEGER ROBERT HENRY	10	M	6	9	323	531	548	555	571	
	*** INFEASABLE REQUEST LIST ***										
2265	RITCHEY KAREN CLARK	10	F	7	64	309	531	537	552	565	569
2266	ROBBINS BRYAN KEITH	10	M	7	8	324	537	552	559	565	569
2267	ROPER JOE JERAL	10	M	7	23	309	537	549	556	565	569
2268	ROSS JILL ELAINE	10	F	6	9	308	537	552	565	569	
2269	ROSS SHERYL DENISE	10	F	5	8	309	550	555	571		
2270	RUSSELL GREG THOMAS	10	M	6	9	308	539	556	559	571	
	*** INFEASABLE REQUEST LIST ***										
2271	RUSSELL MARK BROOKS	10	M	7	7	309	537	550	558	565	569
2272	RUSSELL ROBERT LEON	10	M	6	537	549	556	559	565	569	
2273	SANCHEZ DORA BELISA	10	F	6	537	539	556	561	565	569	
2274	SANDERS RALPH MARK	10	M	5	9	308	545	556	571		
2275	SCHMIDT TROY KEVIN	10	M	7	9	359	537	549	556	565	569
2276	SHAW MARGUERITE	10	F	5	8	309	558	561	571		
2277	SHETTON JOHN TRIY	10	M	5	9	308	543	555	571		
2278	SHERIDAN LORI L	10	F	4	550	558	561	571			
2279	HSIPMAN GENE ALLEN	10	M	7	9	323	537	556	565	569	578

2280	SHGDERT KRISTI LEIGH	10	F	6	537	556	564	565	569	577		
2281	SIDES VICKY ANN	10	F	7	8	309	537	552	564	565	569	
2282	SIMMONS HELEN S	10	F	8	9	24	323	399	537	556	565	569
2283	SIMSON DAVID W	10	M	7	9	323	537	548	556	565	569	
2284	SKIPLPCE JANESE GAL	10	F	5	8	323	546	558	571			
2285	SMITH BRENDA EILEEN	10	F	6	531	537	544	552	565	569		
2286	SMITH GLORIA DEAN	10	F	6	9	16	306	399	566	572		
2287	SMITH TAMARA KAY	10	F	4	531	558	561	571				
2288	SMITH YVONNE N	10	F	7	8	309	532	537	558	565	569	
2289	SNIDER CYNTHIA KAY	10	F	5	12	309	558	561	571			
2290	SNOW SHARON J	10	F	7	9	364	537	550	556	565	569	
2291	SPANN BANDI L	10	F	7	12	309	537	558	564	565	569	
2292	STANDIFER MICHAEL J	10	M	5	8	309	550	558	571			
2293	ST CLAIRE STEVE GLEN	10	M	7	60	309	530	537	556	565	569	
2294	STEELY MICHAEL E	10	M	6	537	548	556	559	565	569		
2295	STEVES CALVIN L	10	M	3	529	570	585					
2296	STEVES CLINTON C	10	M	4	9	305	549	570				
2297	STRATEGIER KIMBERLY	10	F	5	9	399	555	559	571			
2298	STREET CLINTON LEON	10	M	6	537	549	551	556	565	569		
2299	SWANN MICHAEL K	10	M	7	16	308	537	552	565	569	575	
2300	TABB SHELVIE R	10	M	7	23	309	537	549	552	565	569	
2301	TABB TERRY ELAINE	10	F	5	9	362	547	566	572			
2302	TALIFERRO KEITH LEE	10	M	4	9	385	548	570				
2303	TATE CARTER LEE	10	M	4	9	305	548	570				
2304	TAYLOR SALLY ELIZABETG	10	F	7	19	309	537	547	558	565	569	
2305	TAYLOR SANDRA KAY	10	F	7	16	367	537	552	564	565	569	
2306	TEE DOREEN JO	10	F	7	23	309	537	550	558	565	569	
2307	TEVAULT BAMBI LYNET	10	F	7	99	309	531	537	552	565	569	
2308	THOMPSON SHERI LEE	10	F	5	12	309	558	571	575			
2309	TILKENS ANNA JOYCE	10	F	7	9	308	537	550	556	565	569	
2310	TODD JOHN ERIC	10	M	7	5	309	537	552	559	565	569	
2311	TOMLIN GENA LOUISE	10	F	5	8	309	556	562	571			
2312	TOUHEY DEBBIE SUE	10	F	5	64	309	550	566	572			
2313	TOWNSEND JERRY DON	10	M	7	16	309	537	550	552	565	569	
2314	TRAVIS JAN THARESA	10	F	6	530	534	535	557	568	581		
2315	TURNER JERRY D	10	M	5	24	309	558	560	571			
2316	VAIL DIANA LYNNE	10	F	7	12	309	537	558	559	565	569	
2317	VALENTINE MARK S	10	M	7	7	399	537	549	556	565	569	
2318	VANDERHELM BECKY S	10	F	7	9	323	537	541	558	565	569	
2319	VANHORN THOMAS H	10	M	2	566	572						
2320	VAUGHAN HOLLY JENIS	10	F	6	537	539	552	561	565	569		
2321	VO HOANE ANH THI	10	F	6	531	537	539	558	565	569		
2322	WADDLLE MICHAEL D	10	M	7	9	323	537	549	552	565	569	
2323	WADDLE SHELLY SUE	10	F	7	64	309	531	537	558	565	569	
2324	WALKER HAS BRETT	10	M	4	560	567	572	575				
2325	WALKUP SCOTT DANIEL	10	M	7	23	309	537	556	565	569	579	
2326	WALLACE DAVID EAVEN	10	M	7	7	309	537	545	556	565	569	
2327	WALSH DAVID GLENN	10	M	7	7	309	537	551	556	565	569	
2328	WARREN SANDY KAY	10	F	7	5	309	537	558	561	565	569	
2329	WATFORD JOHN CLAUDE	10	M	6	23	309	552	560	565	569		
2330	WEBB ROBERT L	10	M	5	99	309	560	566	572			
2331	WELCH DOUGLAS GRANT	10	M	6	537	550	558	559	565	569		
2332	WELLS MARY BETH	10	F	5	12	309	558	564	571			
2333	WHEELER TODD VER	10	M	4	559	565	572	578				
2334	WHITEHEAD ROY DALE	10	M	7	24	309	537	549	556	565	569	
2335	WHITMORE JAMES E	10	M	7	23	325	537	552	565	569	576	
2336	WICKHAM NOVELLA LYN	10	F	4	531	550	558	571				
2337	WIGGINS BICKY DALE	10	M	4	560	566	572	579				
2338	WILKERSON GINGER P	10	F	7	9	308	537	550	552	565	569	
2339	WILLCOX BILLY DON	10	M	5	534	557	560	568	581			
2340	WILLIAMS G KENT	10	M	7	9	323	537	551	552	565	569	
2344	IWILLIAMS MARVIN RAY	10	M	6	537	548	556	565	569	579		
2345	WILLIAMS ROBIN LYNN	10	F	7	12	309	531	537	558	565	569	
2346	WILLIAMSON LICIA NO	10	F	7	9	316	537	556	561	565	569	
2347	WILLIFORD DOUGLAS L	10	M	6	531	537	552	559	565	569		
2348	WILLSON MIKE LEE	10	M	5	9	323	548	566	572			

2349	WILSON ALLEN ODEAN	10	M	7	9	316	537	551	555	565	569
2350	WILSON JENNIE LLU	10	F	4	539	558	571	575			
2351	WIMSETT DENISE LEE	10	F	7	5	309	531	537	558	565	569
2352	WINES STEVE VINEYURD	10	M	6	530	533	557	559	565	569	
2353	WITT DONNA GAYLE	10	F	7	12	309	531	537	550	558	569
2354	WOLF DAVID WAYNE	10	M	6	530	531	537	556	565	569	
2355	WOMACK SUSAN RHENEA	10	F	5	9	316	558	561	571		
2356	WOOD CECILIA ANN	10	F	5	12	309	558	561	571		
2357	WOODCOCK PATRICIA D	10	F	7	9	399	537	556	565	569	577
2358	YAHN KIMBERLY DIAN	10	F	8	9	317	552	564	571		
2359	YATES THEODORE THOM	10	M	7	9	323	537	557	559	566	569
2360	ZIBOLSKY LISA KAY	10	F	7	25	309	537	558	565	569	580
2361	ZWICK EVAN	10	M	7	19	309	537	557	565	569	575

APPENDIX III

PART B. OUTPUT LISTINGS

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                 NUMBER OF COURSES OFFERED  68          NUMBER OF STUDENTS  714

        NO. OF COURSES HAVING NO REQUESTS   6        NO OF STUDENTS WITH INFEASABLE REQUEST LISTS  12

             NUMBER OF COURSES TO BE SCHEDULED  62          NUMBER OF STUDENTS TO BE SCHEDULED  702


                  COURSES ARRANGED ACCORDING TO INDICES OF DIFFICULTY


COURSE  SECTIONS                 TYPE  SEMESTER  INDEX OF DIFFICULTY   COURSE AND TIME RESTRICTIONS

  529   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 6  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=   1
                 2295

  538   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 3  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=  22
                 1023  1054  1064  1123  1169  1174  1189  1233  1236  1265  1266  1269
                 1317  1336  1355  2001  2023  2111  2152  2170  2181  2200

  540   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 4  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=  11
                 1004  1095  1115  1172  1200  1204  1207  1234  1271  1276  1328

  541   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 4  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=   4
                 2030  2096  2109  2318

  550   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 5  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=  64
                 1009  1032  1042  1043  1047  1069  1070  1087  1095  1113  1126  1134
                 1135  1137  1165  1175  1176  1184  1186  1205  1206  1209  1216  1221
                 1253  1258  1272  1286  2025  2029  2041  2056  2062  2069  2083  2088
                 2092  2094  2110  2119  2129  2131  2146  2155  2192  2210  2229  2230
                 2235  2255  2258  2269  2271  2278  2290  2292  2306  2309  2312  2313
                 2331  2336  2338  2353

  551   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 4  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=  28
                 1013  1018  1034  1041  1064  1114  1143  1178  1185  1202  1231  1255
                 1263  1270  1309  1337  2004  2070  2109  2130  2136  2153  2169  2256
                 2298  2327  2340  2349

  559   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 6  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1= 117
                 1002  1003  1005  1010  1011  1025  1037  1049  1051  1052  1059  1060
                 1061  1062  1063  1072  1078  1079  1084  1088  1092  1093  1101  1104
                 1116  1125  1138  1143  1146  1160  1163  1168  1181  1188  1196  1201
                 1209  1211  1220  1223  1227  1229  1231  1241  1244  1245  1250  1254
                 1260  1261  1267  1280  1281  1294  1299  1302  1303  1305  1307  1310
                 1314  1315  1319  1324  1326  1335  1339  1347  2006  2007  2015  2017
                 2045  2049  2056  2060  2063  2065  2067  2071  2072  2076  2091  2097
                 2099  2142  2143  2150  2163  2175  2176  2185  2193  2203  2207  2217
                 2218  2226  2227  2232  2237  2240  2247  2251  2261  2263  2266  2272
                 2294  2297  2310  2316  2331  2333  2347  2352  2359

  561   MSEC= 1  ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 6  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       0      0      0  K1=  54
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            1016  1046  1053  1065  1067  1070  1071  1089  1105  1115  1120  1127
            1147  1161  1180  1186  1199  1202  1237  1249  1258  1268  1275  1282
            1289  1308  1311  1322  1325  1341  2001  2009  2027  2057  2058  2082
            2129  2146  2148  2172  2188  2195  2198  2200  2273  2276  2278  2287
            2289  2320  2328  2346  2355  2356

578   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 0  ITIME3= 0  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  26
            1005  1024  1027  1029  1086  1158  1167  1171  1196  1198  1212  1225
            1251  1327  2021  2022  2071  2108  2144  2164  2232  2245  2246  2263
            2279  2333

579   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 0  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 0  ITIME3= 0  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  14
            2047  2052  2089  2090  2116  2123  2153  2173  2196  2250  2254  2325
            2337  2344

 12   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 0  ISEM= 1   IDF=     0  ITME= 0  ITIME1= 3  ITIME2= 0  ITIME3= 0  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  19
            2001  2006  2009  2092  2094  2095  2119  2150  2198  2220  2262  2289
            2291  2308  2316  2332  2345  2353  2356

570   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 4  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  15
            1015  1111  1117  1210  1274  1354  2078  2100  2104  2106  2190  2295
            2296  2302  2303

571   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 3  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 1  ITIME3= 3  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  68
            1197  1314  2004  2005  2008  2014  2024  2029  2030  2031  2046  2069
            2070  2081  2084  2088  2095  2098  2099  2112  2119  2124  2125  2129
            2130  2131  2140  2142  2143  2144  2146  2150  2170  2174  2181  2187
            2191  2192  2193  2198  2200  2203  2211  2213  2225  2228  2234  2237
            2262  2269  2274  2276  2277  2278  2284  2287  2289  2292  2297  2308
            2311  2315  2332  2336  2350  2355  2356  2358

572   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 3  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 6  ITIME4= 0
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            2010  2018  2020  2021  2022  2026  2027  2032  2034  2036  2043  2050
            2052  2054  2064  2066  2071  2073  2075  2091  2113  2136  2141  2147
            2151  2160  2186  2197  2199  2206  2208  2216  2221  2232  2233  2236
            2242  2245  2248  2254  2263  2286  2301  2312  2319  2324  2330  2333
            2337  2348

573   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 3  ISEM= 0   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 1  ITIME3= 3  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  69
            1003  1004  1013  1023  1025  1029  1032  1033  1034  1043  1044  1056
            1059  1060  1063  1064  1076  1077  1088  1099  1106  1109  1110  1122
            1123  1134  1143  1148  1151  1153  1154  1164  1165  1168  1172  1174
            1176  1178  1185  1186  1189  1190  1206  1222  1227  1239  1244  1245
            1246  1250  1253  1254  1256  1258  1263  1265  1286  1298  1304  1308
            1311  1315  1319  1320  1322  1325  1326  1328  1333

 19   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 1   IDF=     0  ITME= 1  ITIME1= 1  ITIME2= 4  ITIME3= 5  ITIME4= 2
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  21
            1034  1082  1085  1103  1123  1124  1159  1174  1187  1239  1256  1269
            1303  1318  1333  2041  2076  2245  2258  2304  2361

 21   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 1   IDF=     0  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 5  ITIME4= 2
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  22
            1013  1053  1071  1090  1112  1177  1180  1184  1203  1219  1232  1236
            1315  1353  2014  2037  2050  2099  2105  2157  2169  2239

320   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 2   IDF=     0  ITME= 1  ITIME1= 1  ITIME2= 4  ITIME3= 5  ITIME4= 2
                     NCR1 NG1  NCR2 NG2  NCR3 NG3         0       0       0   K1=  10
            1034  1082  1085  1123  1124  1159  1239  1256  1269  1333
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321   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 2   IDF=      0  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 5  ITIME4= 2
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  15
            1006  1013  1039  1053  1071  1090  1177  1180  1184  1203  1232  1235
            1315  1318  1353

575   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 0   IDF=      0  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  48
            1022  1055  1081  1105  1108  1109  1110  1149  1154  1190  1201  1203
            1208  1210  1262  1337  1346  2012  2028  2030  2038, 2039  2051  2055
            2075  2078  2095  2105  2107  2115  2117  2123  2132  2134  2145  2171
            2182  2183  2189  2204  2222  2231  2299  2308  2324  2335  2350  2361

577   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 0   IDF=      0  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  26
            1018  1066  1097  1182  1239  1242  1259  1264  1283  1287  1289  1293
            1318  1351  2040  2048  2092  2118  2152  2221  2222  2224  2234  2257
            2280  2357

 16   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 1   IDF= 90104  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  17
            1079  1125  1333  2012  2018  2027  2077  2151  2157  2158  2165  2227
            2260  2286  2299  2305  2313

532   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 0   IDF= 90086  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  17
            2037  2046  2098  2108  2126  2140  2170  2174  2202  2211  2212  2215
            2220  2230  2242  2249  2288

316   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 2   IDF= 90075  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  12
            1067  1189  1245  1284  2026  2036  2081  2093  2238  2346  2349  2355

  7   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 1   IDF= 90073  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  16
            1244  2057  2059  2074  2080  2120  2122  2127  2185  2214  2226  2256
            2271  2317  2326  2327

306   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 2   IDF= 90072  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  13
            1041  1093  1096  1135  1175  1257  1274  1290  1324  1335  1352  2162
            2286

555   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 0   IDF= 90056  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=   7
            2056  2191  2200  2269  2277  2297  2349

547   MSEC= 1   ISEC= 1  NJ=  0  ITYP= 1  ISEM= 0   IDF= 90034  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=   6
            2100  2190  2221  2238  2301  2304

534   MSEC= 3   ISEC= 3  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64253  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 6  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  97
            1002  1005  1006  1007  1008  1011  1014  1019  1021  1024  1026  1027
            1035  1041  1046  1048  1049  1050  1057  1058  1061  1062  1072  1089
            1091  1093  1094  1108  1116  1118  1121  1125  1131  1136  1138  1139
            1141  1144  1145  1150  1152  1158  1160  1161. 1167  1170  1171  1173
            1181  1182  1191  1193  1195  1196  1211  1212  1213  1215  1216  1217
            1218  1219  1221  1226  1231  1240  1241  1249  1255  1257  1266  1267
            1270  1278  1290  1293  1301  1305  1306  1312  1313  1321  1331  1334
            1336  1337  1338  1340  1343  1346  1348  1350  1352  1355  2042  2314
            2339

581   MSEC= 3   ISEC= 3  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64247  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 6  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  93
            1002  1005  1006  1007  1008  1011  1014  1019  1021  1024  1026  1027
```

```
                1035  1041  1046  1048  1049  1050  1057  1058  1061  1062  1072  1086
                1089  1091  1093  1094  1108  1116  1118  1121  1125  1131  1136  1138
                1139  1141  1144  1145  1150  1152  1158  1160  1161  1167  1171  1173
                1181  1182  1191  1193  1195  1196  1211  1212  1213  1215  1216  1217
                1219  1221  1226  1231  1240  1241  1249  1255  1257  1266  1267  1270
                1290  1293  1301  1305  1306  1312  1313  1321  1331  1334  1336  1338
                1340  1343  1346  1350  1352  1355  2042  2314  2339

568    MSEC= 3  ISEC= 3  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64244  ITME= 0  ITIME1= 1  ITIME2= 4  ITIME3= 6  ITIME4= 0
                             NCR1 NG1  NCR2 NG2  NCR3 NG3     0        0        0   K1=  95
                1002  1005  1006  1007  1008  1011  1014  1019  1021  1024  1026  1027
                1035  1041  1046  1048  1049  1050  1057  1058  1061  1062  1072  1086
                1089  1091  1093  1094  1108  1116  1118  1121  1125  1131  1136  1138
                1139  1141  1144  1145  1150  1152  1158  1160  1161  1167  1171  1173
                1181  1182  1191  1193  1195  1211  1212  1213  1215  1216  1217  1219
                1221  1226  1231  1240  1241  1249  1255  1257  1266  1267  1270  1278
                1290  1293  1301  1305  1306  1312  1313  1321  1331  1334  1336  1338
                1340  1343  1346  1348  1350  1352  1355  2042  2149  2314  2339

530    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64206  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 1
                             NCR1 NG1  NCR2 NG2  NCR3 NG3     7        0        0   K1=  65
                1008  1015  1021  1029  1031  1036  1043  1057  1058  1062  1065  1069
                1072  1074  1076  1083  1087  1098  1102  1121  1141  1142  1149  1156
                1168  1177  1179  1183  1187  1188  1195  1198  1200  1205  1222  1233
                1234  1236  1247  1259  1260  1261  1276  1295  1301  1311  1323  1331
                1334  1339  1349  2011  2084  2166  2168  2183  2202  2208  2215  2223
                2260  2293  2314  2352  2354

  5    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 1   IDF= 64205  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 3
                             NCR1 NG1  NCR2 NG2  NCR3 NG3     7      530        0   K1=  49
                1039  1041  1090  1093  1094  1096  1100  1107  1135  1148  1156  1160
                1175  1197  1210  1226  1243  1255  1257  1274  1279  1282  1286  1288
                1290  1306  1312  1313  1324  1330  1335  1340  1342  1342  1345  1352
                2022  2032  2054  2060  2121  2137  2161  2175  2176  2209  2310  2328
                2351

562    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64176  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 1
                             NCR1 NG1  NCR2 NG2  NCR3 NG3   561        0        0   K1=   7
                1050  1164  1242  1293  2054  2147  2311

564    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64175  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 3
                             NCR1 NG1  NCR2 NG2  NCR3 NG3   561      562        0   K1=  47
                1012  1031  1039  1042  1091  1094  1097  1108  1111  1124  1126  1154
                1195  1216  1217  1230  1238  1246  1252  1264  1278  1283  1332  1346
                1351  2032  2086  2107  2126  2128  2157  2167  2179  2201  2204  2205
                2208  2234  2239  2257  2262  2280  2281  2291  2305  2332  2358

546    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 64155  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 1
                             NCR1 NG1  NCR2 NG2  NCR3 NG3   547        0        0   K1=  43
                1001  1015  1027  1033  1035  1036  1038  1045  1080  1083  1096  1106
                1110  1111  1112  1130  1131  1136  1145  1147  1155  1167  1173  1176
                1178  1182  1193  1194  1199  1213  1218  1222  1235  1249  1278  1288
                1298  1300  1301  1312  1331  2135  2284

324    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 2   IDF= 64154  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 3
                             NCR1 NG1  NCR2 NG2  NCR3 NG3   547      546        0   K1=  32
                1014  1030  1075  1091  1094  1112  1148  1156  1160  1169  1174  1206
                1240  1257  1279  1282  1286  1288  1312  1313  1330  1343  2054  2058
                2145  2151  2167  2174  2211  2216  2240  2266

 24    MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 1   IDF= 64152  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 3
                             NCR1 NG1  NCR2 NG2  NCR3 NG3   547      546        0   K1=  36
                1006  1040  1045  1077  1142  1162  1166  1189  1246  1272  1304  1316
                1319  1320  1328  2015  2017  2040  2063  2077  2093  2125  2128  2133
                2140  2147  2148  2179  2194  2217  2219  2252  2261  2282  2316  2334
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305   MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 2   IDF= 64103  ITHE= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 3
                     NCR1 NG1  NCR2 NG2  NCR3 NG3      306    530      0   K1=  20
             1045  1224  1277  2010  2031  2034  2039  2043  2045  2067  2082  2104
             2106  2159  2190  2194  2214  2253  2296  2303

  8   MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 1   IDF= 60268  ITHE= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3        0      0      0   K1=  49
             1014  1030  1056  1067  1075  1091  1121  1146  1169  1172  1191  1206
             1224  1228  1245  1277  1284  1343  1344  2002  2007  2010  2049  2062
             2065  2069  2087  2117  2144  2151  2161  2181  2182  2194  2203  2232
             2236  2237  2247  2254  2263  2266  2269  2276  2281  2284  2288  2292
             2311

308   MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 2   IDF= 60252  ITHE= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3        0      0      0   K1=  57
             1040  1077  1079  1100  1103  1104  1125  1129  1132  1152  1166  1197
             1246  1254  1292  1303  1304  1316  1319  1333  1334  1342  1342  1345
             2016  2024  2034  2038  2048  2072  2077  2107  2112  2115  2131  2149
             2157  2165  2169  2178  2192  2196  2199  2207  2210  2212  2241  2242
             2243  2246  2251  2268  2274  2277  2299  2309  2338

323   MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 2   IDF= 60160  ITHE= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                     NCR1 NG1  NCR2 NG2  NCR3 NG3      575    577      0   K1=  35
             1054  1090  1107  1121  1139  1146  1226  1228  1244  1255  1306  1328
             1344  2007  2019  2025  2034  2057  2137  2141  2161  2185  2193  2223
             2231  2247  2279  2282  2283  2284  2318  2322  2340  2348  2369

 23   MSEC= 2  ISEC= 2  NJ=  0  ITYP= 1  ISEM= 1   IDF= 60101  ITHE= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                     NCR1 NG1  NCR2 NG2  NCR3 NG3      575    577      0   K1=  24
             1024  1073  1104  1132  1152  1254  1257  1292  1334  2003  2028  2033
             2035  2046  2093  2110  2136  2138  2267  2300  2306  2325  2329  2335

309   MSEC= 4  ISEC= 4  NJ=  0  ITYP= 1  ISEM= 2   IDF= 56697  ITHE= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3        0      0      0   K1= 133
             2001  2002  2003  2006  2008  2009  2014  2015  2017  2018  2021  2022
             2027  2028  2029  2032  2033  2035  2037  2040  2041  2046  2049  2050
             2052  2059  2060  2062  2063  2064  2065  2069  2074  2076  2077  2090
             2092  2093  2094  2095  2097  2099  2101  2105  2110  2117  2119  2120
             2121  2122  2124  2125  2127  2133  2134  2136  2138  2140  2144  2148
             2150  2151  2158  2161  2164  2171  2175  2176  2179  2181  2182  2194
             2198  2203  2209  2217  2219  2220  2225  2226  2227  2229  2232  2235
             2236  2237  2239  2245  2249  2252  2256  2258  2260  2261  2262  2263
             2265  2267  2269  2271  2276  2281  2288  2289  2291  2292  2293  2300
             2304  2306  2307  2308  2310  2311  2312  2313  2315  2316  2323  2325
             2326  2327  2328  2329  2330  2332  2334  2345  2351  2353  2356  2360
             2361

  9   MSEC= 4  ISEC= 4  NJ=  0  ITYP= 1  ISEM= 1   IDF= 56422  ITHE= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3        0      0      0   K1=  98
             2013  2016  2019  2020  2024  2025  2026  2031  2034  2036  2038  2039
             2043  2044  2045  2048  2058  2067  2072  2078  2079  2081  2082  2083
             2085  2088  2089  2098  2100  2104  2106  2107  2111  2112  2115  2131
             2135  2141  2145  2149  2159  2162  2167  2168  2174  2178  2184  2188
             2190  2192  2193  2196  2199  2206  2207  2210  2211  2212  2214  2215
             2216  2222  2223  2228  2231  2238  2240  2241  2242  2243  2246  2251
             2268  2274  2275  2277  2279  2282  2283  2286  2290  2296  2297  2301
             2302  2303  2309  2318  2322  2338  2340  2346  2348  2349  2355  2357
             2358  2359

553   MSEC= 4  ISEC= 4  NJ=  0  ITYP= 1  ISEM= 0   IDF= 56357  ITHE= 0  ITIME1= 1  ITIME2= 1  ITIME3= 4  ITIME4= 0
                     NCR1 NG1  NCR2 NG2  NCR3 NG3        0      0      0   K1= 102
             1003  1009  1010  1014  1016  1018  1020  1028  1033  1038  1046  1047
             1054  1061  1066  1069  1073  1077  1082  1083  1085  1087  1088  1089
             1090  1095  1097  1101  1103  1104  1105  1115  1125  1126  1127  1129
             1132  1136  1137  1139  1140  1147  1148  1152  1155  1156  1159  1166
             1179  1180  1187  1188  1205  1207  1215  1218  1224  1230  1231  1232
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                  1234  1235  1237  1243  1249  1252  1260  1261  1262  1265  1268  1269
                  1275  1276  1277  1280  1281  1283  1284  1287  1288  1289  1290  1294
                  1302  1306  1307  1313  1316  1317  1319  1321  1323  1339  1341  1342
                  1342  1343  1345  1351  1355  2080

549   MSEC= 2   ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 56205  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                        NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1=  32
                  2003  2011  2024  2035  2044  2064  2085  2101  2116  2121  2132  2138
                  2141  2149  2160  2186  2191  2197  2206  2225  2243  2250  2259  2267
                  2272  2275  2296  2298  2300  2317  2322  2334

548   MSEC= 3   ISEC= 3  NJ=  0  ITYP= 1  ISEM= 0   IDF= 56204  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                        NCR1 NG1  NCR2 NG2  NCR3 NG3      549       0       0   K1=  83
                  1003  1004  1008  1010  1019  1026  1028  1032  1051  1057  1060  1061
                  1074  1078  1084  1101  1113  1116  1117  1118  1120  1122  1128  1129
                  1132  1138  1140  1144  1150  1152  1155  1158  1162  1163  1170  1171
                  1179  1204  1207  1211  1212  1214  1215  1220  1223  1226  1228  1229
                  1241  1243  1247  1248  1263  1273  1284  1285  1290  1292  1294  1299
                  1302  1305  1307  1313  1321  1326  1329  1338  1343  1344  1350  1354
                  2020  2087  2091  2120  2153  2283  2294  2302  2303  2344  2348

560   MSEC= 2   ISEC= 2  NJ=  0  ITYP= 1  ISEM= 0   IDF= 56163  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 1
                        NCR1 NG1  NCR2 NG2  NCR3 NG3      559       0       0   K1=  45
                  1017  1028  1086  1107  1128  1136  1144  1159  1170  1191  1214  1215
                  1221  1251  1271  1285  1306  1317  1323  1327  1329  1330  1350  1352
                  2012  2016  2023  2026  2033  2042  2066  2127  2160  2184  2186  2197
                  2219  2241  2254  2315  2324  2329  2330  2337  2339

557   MSEC= 4   ISEC= 4  NJ=  0  ITYP= 1  ISEM= 0   IDF= 52370  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                        NCR1 NG1  NCR2 NG2  NCR3 NG3        8       0       0   K1= 119
                  1002  1005  1007  1008  1011  1019  1021  1024  1026  1027  1035  1036
                  1041  1045  1048  1049  1050  1055  1058  1062  1068  1072  1074  1080
                  1081  1086  1091  1094  1096  1098  1108  1116  1118  1120  1121  1124
                  1128  1131  1135  1138  1141  1144  1145  1149  1150  1158  1160  1167
                  1170  1171  1172  1173  1177  1181  1182  1183  1184  1191  1193  1195
                  1196  1198  1202  1203  1204  1208  1211  1212  1213  1214  1216  1217
                  1219  1221  1226  1233  1238  1240  1241  1248  1255  1257  1259  1266
                  1267  1270  1271  1273  1278  1282  1285  1293  1300  1301  1303  1305
                  1312  1327  1330  1331  1334  1336  1337  1338  1340  1346  1347  1348
                  1350  1352  2012  2042  2185  2204  2314  2339  2352  2359  2361

531   MSEC= 4   ISEC= 4  NJ=  0  ITYP= 1  ISEM= 0   IDF= 48516  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 1
                        NCR1 NG1  NCR2 NG2  NCR3 NG3      532       0       0   K1= 161
                  1006  1007  1009  1012  1016  1017  1019  1020  1021  1022  1023  1025
                  1030  1033  1035  1037  1038  1040  1044  1046  1047  1049  1050  1052
                  1055  1056  1058  1063  1066  1075  1076  1077  1080  1081  1082  1085
                  1089  1092  1098  1099  1100  1102  1103  1106  1109  1114  1118  1122
                  1127  1130  1131  1137  1139  1140  1145  1148  1151  1153  1154  1161
                  1165  1166  1173  1183  1185  1190  1197  1208  1213  1217  1218  1219
                  1224  1225  1227  1230  1232  1237  1238  1250  1252  1253  1256  1265
                  1266  1268  1270  1273  1275  1277  1279  1287  1298  1300  1304  1308
                  1309  1314  1316  1320  1322  1325  1332  1336  1341  1342  1342  1345
                  1349  1353  1355  2002  2013  2018  2032  2036  2047  2051  2055  2075
                  2079  2081  2086  2096  2112  2124  2130  2133  2137  2152  2157  2159
                  2162  2165  2172  2173  2187  2189  2191  2199  2205  2209  2213  2214
                  2216  2218  2236  2253  2259  2265  2285  2287  2307  2321  2323  2336
                  2345  2347  2351  2353  2354

558   MSEC= 5   ISEC= 5  NJ=  0  ITYP= 1  ISEM= 0   IDF= 40763  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                        NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0   K1= 145
                  1032  1039  1056  1057  1059  1063  1092  1110  1134  1164  1174  1186
                  1227  1245  1246  1250  1254  1263  1311  1320  1322  1325  1326  1328
                  1332  1333  2001  2002  2004  2006  2007  2008  2009  2014  2015  2023
                  2024  2025  2029  2030  2031  2033  2041  2045  2046  2048  2055  2059
                  2063  2067  2070  2072  2076  2079  2081  2084  2088  2092  2094  2095
                  2099  2101  2110  2112  2115  2119  2121  2122  2124  2125  2129  2130
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                2140  2142  2143  2144  2148  2150  2152  2155  2159  2163  2165  2173
                2174  2175  2176  2178  2181  2187  2192  2193  2198  2203  2207  2210
                2211  2212  2213  2217  2218  2220  2224  2225  2228  2229  2230  2234
                2237  2239  2251  2252  2253  2255  2259  2260  2262  2271  2276  2278
                2284  2287  2288  2289  2291  2292  2304  2306  2308  2315  2316  2318
                2321  2323  2328  2331  2332  2336  2345  2350  2351  2353  2355  2356
                2360

556   MSEC= 5   ISEC= 5  NJ=  0  ITYP= 1  ISEM= 0   IDF= 40358  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1=  90
                2003  2005  2011  2016  2028  2037  2038  2039  2040  2044  2047  2051
                2057  2058  2060  2069  2083  2085  2089  2090  2093  2105  2108  2109
                2111  2118  2120  2126  2127  2128  2131  2133  2135  2137  2138  2139
                2146  2149  2153  2154  2161  2162  2164  2166  2167  2168  2169  2179
                2182  2183  2186  2194  2195  2196  2201  2209  2214  2219  2222  2223
                2227  2246  2250  2256  2257  2261  2267  2272  2273  2274  2275  2279
                2280  2282  2283  2290  2293  2294  2298  2309  2311  2317  2325  2326
                2327  2334  2344  2346  2354  2357

535   MSEC= 5   ISEC= 5  NJ=  0  ITYP= 1  ISEM= 0   IDF= 40028  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1=  15
                1002  1011  1026  1141  1150  1181  1193  1240  1267  1321  1338  2042
                2118  2149  2314

525   MSEC= 5   ISEC= 5  NJ=  0  ITYP= 1  ISEM= 0   IDF= 40011  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1=   4
                1020  2125  2143  2201

569   MSEC= 7   ISEC= 7  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4218  ITME= 1  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 2
                         NCR1 NG1  NCR2 NG2  NCR3 NG3       16     316       0  K1= 218
                1169  2001  2002  2003  2006  2007  2009  2011  2012  2013  2015  2016
                2017  2019  2023  2025  2026  2033  2035  2037  2038  2039  2040  2041
                2044  2045  2047  2048  2049  2051  2055  2057  2058  2059  2060  2062
                2063  2065  2067  2072  2074  2076  2077  2079  2080  2082  2083  2085
                2086  2087  2089  2090  2092  2093  2094  2096  2097  2101  2105  2107
                2108  2109  2110  2111  2115  2116  2117  2118  2120  2121  2122  2123
                2126  2127  2128  2132  2133  2134  2135  2137  2138  2139  2145  2148
                2149  2152  2153  2154  2155  2158  2159  2161  2162  2163  2164  2165
                2166  2167  2168  2169  2171  2172  2173  2175  2176  2178  2179  2180
                2182  2183  2184  2185  2188  2189  2194  2195  2196  2201  2202  2204
                2205  2207  2209  2210  2212  2214  2215  2217  2218  2219  2220  2222
                2223  2224  2226  2227  2229  2230  2231  2235  2238  2239  2240  2241
                2243  2246  2247  2249  2250  2251  2252  2253  2255  2256  2257  2258
                2259  2260  2261  2265  2266  2267  2268  2271  2272  2273  2275  2279
                2280  2281  2282  2283  2285  2288  2290  2291  2293  2294  2298  2299
                2300  2304  2305  2306  2307  2309  2310  2313  2316  2317  2318  2320
                2321  2322  2323  2325  2326  2327  2328  2329  2331  2334  2335  2338
                2340  2344  2345  2346  2347  2349  2351  2352  2353  2354  2357  2359
                2360  2361

537   MSEC= 7   ISEC= 7  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4210  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                         NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1= 210
                2001  2002  2006  2007  2009  2011  2013  2015  2016  2017  2019  2023
                2025  2028  2033  2035  2037  2038  2039  2040  2041  2044  2045  2047
                2048  2049  2051  2055  2056  2057  2058  2059  2062  2063  2065  2067
                2072  2074  2076  2077  2079  2080  2082  2083  2085  2086  2087  2089
                2090  2092  2093  2094  2096  2101  2105  2107  2108  2109  2110  2111
                2115  2116  2117  2118  2120  2121  2122  2123  2126  2128  2132  2133
                2134  2135  2137  2138  2139  2145  2148  2152  2153  2154  2155  2158
                2159  2161  2162  2163  2164  2165  2166  2167  2168  2169  2171  2172
                2173  2175  2176  2178  2179  2180  2182  2183  2185  2188  2189  2194
                2195  2196  2201  2202  2204  2205  2207  2209  2210  2212  2214  2215
                2216  2217  2218  2219  2220  2222  2223  2224  2226  2227  2229  2230
                2231  2235  2238  2239  2240  2241  2243  2246  2247  2249  2250  2251
                2252  2253  2255  2256  2257  2258  2259  2260  2261  2265  2266  2267
                2268  2271  2272  2273  2275  2279  2280  2281  2282  2283  2285  2288
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                2290  2291  2293  2294  2298  2299  2300  2304  2305  2306  2307  2309
                2310  2313  2316  2317  2318  2320  2321  2322  2323  2325  2326  2327
                2328  2331  2334  2335  2338  2340  2344  2345  2346  2347  2349  2351
                2353  2354  2357  2359  2360  2361

565   MSEC= 7   ISEC= 7  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4202  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1= 202
                2002  2003  2006  2007  2009  2012  2013  2015  2017  2019  2023  2025
                2028  2033  2035  2037  2038  2039  2040  2041  2044  2045  2047  2048
                2049  2051  2055  2058  2059  2063  2065  2066  2067  2072  2074  2076
                2077  2079  2080  2082  2083  2085  2086  2087  2089  2090  2094  2096
                2097  2101  2105  2107  2108  2109  2110  2111  2115  2116  2117  2120
                2122  2123  2126  2127  2128  2132  2133  2134  2135  2137  2138  2139
                2145  2148  2153  2155  2158  2159  2161  2162  2163  2164  2165  2166
                2167  2168  2169  2171  2172  2173  2175  2176  2178  2179  2180  2182
                2183  2184  2185  2188  2189  2194  2195  2196  2201  2202  2204  2205
                2207  2208  2209  2210  2212  2217  2218  2219  2220  2223  2224  2226
                2227  2229  2230  2231  2235  2238  2239  2240  2241  2243  2246  2247
                2249  2250  2251  2252  2253  2255  2256  2257  2259  2260  2261  2265
                2266  2267  2268  2271  2272  2273  2275  2279  2280  2281  2282  2283
                2285  2288  2290  2291  2293  2294  2298  2299  2300  2304  2305  2306
                2307  2309  2310  2313  2316  2317  2318  2320  2321  2322  2323  2325
                2326  2327  2328  2329  2331  2333  2334  2335  2338  2340  2344  2345
                2346  2347  2349  2351  2352  2354  2357  2359  2360  2361

567   MSEC= 7   ISEC= 7  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4193  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1= 193
                1001  1009  1010  1012  1016  1017  1018  1020  1022  1028  1030  1031
                1036  1037  1038  1039  1040  1042  1045  1047  1051  1052  1053  1054
                1055  1065  1066  1067  1068  1069  1070  1071  1073  1074  1075  1078
                1079  1080  1081  1082  1083  1084  1085  1087  1090  1092  1095  1096
                1097  1098  1100  1101  1102  1103  1104  1105  1107  1112  1113  1114
                1115  1119  1120  1124  1126  1127  1128  1129  1130  1132  1133  1135
                1137  1140  1142  1146  1147  1149  1155  1156  1157  1159  1162  1163
                1166  1170  1175  1177  1179  1180  1183  1184  1187  1188  1192  1194
                1198  1199  1200  1201  1202  1203  1204  1205  1207  1208  1209  1214
                1218  1220  1223  1224  1225  1228  1229  1230  1232  1233  1234  1235
                1236  1237  1238  1242  1243  1247  1248  1251  1252  1259  1260  1261
                1262  1264  1268  1269  1271  1272  1273  1275  1276  1277  1279  1280
                1281  1282  1283  1284  1285  1287  1288  1289  1291  1292  1294  1295
                1297  1299  1300  1302  1303  1307  1309  1310  1317  1318  1323  1324
                1327  1329  1330  1332  1335  1337  1339  1341  1342  1342  1344  1345
                1347  1349  1351  1353  2018  2021  2060  2062  2073  2093  2180  2242
                2324

580   MSEC= 8   ISEC= 8  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4191  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1= 191
                1001  1009  1010  1012  1016  1017  1018  1020  1022  1028  1030  1031
                1036  1037  1038  1039  1040  1042  1045  1047  1051  1052  1053  1054
                1055  1065  1066  1067  1068  1069  1070  1071  1073  1074  1075  1078
                1079  1080  1081  1082  1083  1084  1085  1087  1090  1092  1095  1096
                1097  1098  1100  1101  1102  1103  1104  1105  1107  1112  1113  1114
                1115  1119  1120  1124  1126  1127  1128  1129  1130  1132  1133  1135
                1137  1140  1142  1146  1147  1149  1155  1156  1157  1159  1162  1163
                1166  1169  1170  1175  1177  1179  1180  1183  1184  1187  1188  1192
                1194  1198  1199  1200  1201  1202  1203  1204  1205  1207  1208  1209
                1214  1218  1220  1223  1224  1225  1228  1229  1230  1232  1233  1234
                1235  1236  1237  1238  1242  1243  1247  1248  1251  1252  1259  1260
                1261  1262  1264  1268  1269  1271  1272  1273  1275  1276  1277  1278
                1279  1280  1281  1282  1283  1284  1285  1287  1288  1289  1291  1292
                1294  1295  1297  1299  1300  1302  1303  1307  1309  1310  1316  1317
                1318  1323  1324  1327  1329  1330  1332  1335  1337  1339  1341  1342
                1342  1344  1345  1347  1348  1349  1351  1353  2050  2073  2360

533   MSEC= 7   ISEC= 7  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4188  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                      NCR1 NG1  NCR2 NG2  NCR3 NG3        0       0       0  K1= 188
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                    1001  1009  1010  1012  1016  1017  1018  1020  1022  1028  1030  1031
                    1036  1037  1038  1039  1040  1042  1045  1047  1051  1052  1053  1054
                    1055  1065  1066  1067  1068  1069  1070  1071  1073  1074  1075  1078
                    1079  1080  1081  1082  1083  1084  1085  1086  1087  1090  1092  1095
                    1096  1097  1098  1100  1101  1102  1103  1104  1105  1107  1112  1113
                    1114  1115  1119  1120  1124  1126  1127  1128  1129  1130  1132  1133
                    1135  1137  1140  1142  1146  1147  1149  1155  1156  1157  1159  1162
                    1163  1166  1169  1175  1177  1179  1180  1183  1184  1187  1188  1192
                    1194  1198  1199  1200  1201  1202  1203  1204  1205  1207  1208  1209
                    1214  1220  1223  1224  1225  1228  1229  1230  1232  1233  1234  1235
                    1236  1237  1238  1242  1243  1247  1248  1251  1252  1259  1260  1261
                    1262  1264  1268  1269  1271  1272  1273  1275  1276  1277  1279  1280
                    1281  1282  1283  1284  1285  1287  1288  1289  1291  1292  1294  1295
                    1297  1299  1300  1302  1303  1307  1309  1310  1316  1317  1318  1323
                    1324  1327  1329  1330  1332  1335  1339  1341  1342  1342  1344  1345
                    1347  1349  1351  1353  2003  2127  2184  2352

 552   MSEC= 6    ISEC= 6  NJ=  0  ITYP= 1  ISEM= 0   IDF=  4172  ITME= 0  ITIME1= 0  ITIME2= 0  ITIME3= 0  ITIME4= 0
                        NCR1 NG1  NCR2 NG2  NCR3 NG3        0     0     0   K1= 172
                    1001  1004  1006  1012  1013  1017  1022  1023  1025  1029  1030  1031
                    1034  1037  1040  1042  1043  1044  1051  1052  1053  1060  1064  1065
                    1067  1070  1071  1075  1076  1078  1079  1084  1093  1099  1100  1102
                    1106  1107  1109  1112  1113  1114  1119  1122  1123  1130  1133  1142
                    1143  1146  1151  1153  1154  1157  1161  1162  1163  1165  1168  1169
                    1175  1176  1178  1185  1189  1190  1192  1194  1197  1199  1200  1201
                    1206  1209  1220  1222  1223  1225  1228  1229  1236  1239  1242  1244
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                    1297  1298  1299  1304  1308  1309  1310  1314  1315  1318  1324  1329
                    1335  1344  1349  1353  2013  2017  2019  2035  2049  2062  2065  2074
                    2077  2082  2086  2096  2097  2116  2117  2123  2132  2134  2145  2157
                    2158  2170  2171  2172  2180  2184  2188  2189  2202  2205  2215  2226
                    2231  2235  2238  2240  2241  2243  2247  2249  2258  2265  2266  2268
                    2281  2285  2299  2300  2305  2307  2310  2313  2320  2322  2329  2335
                    2338  2340  2347  2358
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THE CONFLICT MATRIX FOR SINGLE SECTION COURSES

COURSE 1	(529)	AND	COURSE 2	(538)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 3	(540)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 4	(541)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 5	(550)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 6	(551)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 7	(559)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 8	(561)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 9	(578)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 10	(579)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 11	(12)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 12	(570)	NUMBER OF CONFLICTS=	1
COURSE 1	(529)	AND	COURSE 13	(571)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 14	(572)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 15	(573)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 16	(19)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 17	(21)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 18	(320)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 19	(321)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 1	(529)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 2	(538)	AND	COURSE 3	(540)	NUMBER OF CONFLICTS=	0

COURSE 2 (538) AND COURSE 4 (541) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 5 (550) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 6 (551) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 7 (559) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 8 (561) NUMBER OF CONFLICTS= 2
COURSE 2 (538) AND COURSE 9 (578) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 10 (579) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 11 (12) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 12 (570) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 13 (571) NUMBER OF CONFLICTS= 3
COURSE 2 (538) AND COURSE 14 (572) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 15 (573) NUMBER OF CONFLICTS= 6
COURSE 2 (538) AND COURSE 16 (19) NUMBER OF CONFLICTS= 3
COURSE 2 (538) AND COURSE 17 (21) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 18 (320) NUMBER OF CONFLICTS= 2
COURSE 2 (538) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 20 (575) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 21 (577) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 22 (16) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 23 (532) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 24 (316) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 26 (306) NUMBER OF CONFLICTS= 0
COURSE 2 (538) AND COURSE 27 (555) NUMBER OF CONFLICTS= 1
COURSE 2 (538) AND COURSE 28 (547) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 4 (541) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 5 (550) NUMBER OF CONFLICTS= 1
COURSE 3 (540) AND COURSE 6 (551) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 7 (559) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 8 (561) NUMBER OF CONFLICTS= 1
COURSE 3 (540) AND COURSE 9 (578) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 10 (579) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 11 (12) NUMBER OF CONFLICTS= 0

COURSE 3 (540) AND COURSE 12 (570) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 13 (571) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 14 (572) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 15 (573) NUMBER OF CONFLICTS= 3
COURSE 3 (540) AND COURSE 16 (19) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 17 (21) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 20 (575) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 21 (577) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 22 (16) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 23 (532) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 24 (316) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 26 (306) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 27 (555) NUMBER OF CONFLICTS= 0
COURSE 3 (540) AND COURSE 28 (547) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 5 (550) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 6 (551) NUMBER OF CONFLICTS= 1
COURSE 4 (541) AND COURSE 7 (559) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 8 (561) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 9 (578) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 10 (579) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 11 (12) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 12 (570) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 13 (571) NUMBER OF CONFLICTS= 1
COURSE 4 (541) AND COURSE 14 (572) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 15 (573) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 16 (19) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 17 (21) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0
COURSE 4 (541) AND COURSE 20 (575) NUMBER OF CONFLICTS= 1

COURSE 4	(541)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS= 0
COURSE 4	(541)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 6	(551)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 7	(559)	NUMBER OF CONFLICTS= 3
COURSE 5	(550)	AND	COURSE 8	(561)	NUMBER OF CONFLICTS= 6
COURSE 5	(550)	AND	COURSE 9	(578)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 10	(579)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 11	(12)	NUMBER OF CONFLICTS= 4
COURSE 5	(550)	AND	COURSE 12	(570)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 13	(571)	NUMBER OF CONFLICTS= 12
COURSE 5	(550)	AND	COURSE 14	(572)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 15	(573)	NUMBER OF CONFLICTS= 10
COURSE 5	(550)	AND	COURSE 16	(19)	NUMBER OF CONFLICTS= 2
COURSE 5	(550)	AND	COURSE 17	(21)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 18	(320)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 19	(321)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS= 0
COURSE 5	(550)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS= 1
COURSE 5	(550)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS= 2
COURSE 5	(550)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS= 2
COURSE 5	(550)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS= 0
COURSE 6	(551)	AND	COURSE 7	(559)	NUMBER OF CONFLICTS= 2
COURSE 6	(551)	AND	COURSE 8	(561)	NUMBER OF CONFLICTS= 1

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COURSE  6  ( 551 )   AND   COURSE  9  ( 578 )  NUMBER OF CONFLICTS=   0
COURSE  6  ( 551 )   AND   COURSE 10  ( 579 )  NUMBER OF CONFLICTS=   0
COURSE  6  ( 551 )   AND   COURSE 11  (  12 )  NUMBER OF CONFLICTS=   0
COURSE  6  ( 551 )   AND   COURSE 12  ( 570 )  NUMBER OF CONFLICTS=   0
COURSE  6  ( 551 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=   3
COURSE  6  ( 551 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 15  ( 573 )  NUMBER OF CONFLICTS=   7
COURSE  6  ( 551 )   AND   COURSE 16  (  19 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 17  (  21 )  NUMBER OF CONFLICTS=   2
COURSE  6  ( 551 )   AND   COURSE 18  ( 320 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 19  ( 321 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 20  ( 575 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 21  ( 577 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 22  (  16 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 23  ( 532 )  NUMBER OF CONFLICTS=   0
COURSE  6  ( 551 )   AND   COURSE 24  ( 316 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 25  (   7 )  NUMBER OF CONFLICTS=   2
COURSE  6  ( 551 )   AND   COURSE 26  ( 306 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 27  ( 555 )  NUMBER OF CONFLICTS=   1
COURSE  6  ( 551 )   AND   COURSE 28  ( 547 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE  8  ( 561 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE  9  ( 578 )  NUMBER OF CONFLICTS=   6
COURSE  7  ( 559 )   AND   COURSE 10  ( 579 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE 11  (  12 )  NUMBER OF CONFLICTS=   3
COURSE  7  ( 559 )   AND   COURSE 12  ( 570 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=   9
COURSE  7  ( 559 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=   5
COURSE  7  ( 559 )   AND   COURSE 15  ( 573 )  NUMBER OF CONFLICTS=  16
COURSE  7  ( 559 )   AND   COURSE 16  (  19 )  NUMBER OF CONFLICTS=   2
COURSE  7  ( 559 )   AND   COURSE 17  (  21 )  NUMBER OF CONFLICTS=   2
COURSE  7  ( 559 )   AND   COURSE 18  ( 320 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE 19  ( 321 )  NUMBER OF CONFLICTS=   1
COURSE  7  ( 559 )   AND   COURSE 20  ( 575 )  NUMBER OF CONFLICTS=   1
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COURSE  7  ( 559 )   AND   COURSE 21  ( 577 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE 22  (  16 )  NUMBER OF CONFLICTS=   3
COURSE  7  ( 559 )   AND   COURSE 23  ( 532 )  NUMBER OF CONFLICTS=   0
COURSE  7  ( 559 )   AND   COURSE 24  ( 316 )  NUMBER OF CONFLICTS=   1
COURSE  7  ( 559 )   AND   COURSE 25  (   7 )  NUMBER OF CONFLICTS=   3
COURSE  7  ( 559 )   AND   COURSE 26  ( 306 )  NUMBER OF CONFLICTS=   3
COURSE  7  ( 559 )   AND   COURSE 27  ( 555 )  NUMBER OF CONFLICTS=   2
COURSE  7  ( 559 )   AND   COURSE 28  ( 547 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE  9  ( 578 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 10  ( 579 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 11  (  12 )  NUMBER OF CONFLICTS=   5
COURSE  8  ( 561 )   AND   COURSE 12  ( 570 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=  10
COURSE  8  ( 561 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 15  ( 573 )  NUMBER OF CONFLICTS=   6
COURSE  8  ( 561 )   AND   COURSE 16  (  19 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 17  (  21 )  NUMBER OF CONFLICTS=   3
COURSE  8  ( 561 )   AND   COURSE 18  ( 320 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 19  ( 321 )  NUMBER OF CONFLICTS=   3
COURSE  8  ( 561 )   AND   COURSE 20  ( 575 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 21  ( 577 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 22  (  16 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 23  ( 532 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 24  ( 316 )  NUMBER OF CONFLICTS=   3
COURSE  8  ( 561 )   AND   COURSE 25  (   7 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 26  ( 306 )  NUMBER OF CONFLICTS=   0
COURSE  8  ( 561 )   AND   COURSE 27  ( 555 )  NUMBER OF CONFLICTS=   1
COURSE  8  ( 561 )   AND   COURSE 28  ( 547 )  NUMBER OF CONFLICTS=   0
COURSE  9  ( 578 )   AND   COURSE 10  ( 579 )  NUMBER OF CONFLICTS=   0
COURSE  9  ( 578 )   AND   COURSE 11  (  12 )  NUMBER OF CONFLICTS=   0
COURSE  9  ( 578 )   AND   COURSE 12  ( 570 )  NUMBER OF CONFLICTS=   0
COURSE  9  ( 578 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=   1
COURSE  9  ( 578 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=   7
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COURSE 9 (578) AND COURSE 15 (573) NUMBER OF CONFLICTS= 1

COURSE 9 (578) AND COURSE 16 (19) NUMBER OF CONFLICTS= 1

COURSE 9 (578) AND COURSE 17 (21) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 20 (575) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 21 (577) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 22 (16) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 23 (532) NUMBER OF CONFLICTS= 1

COURSE 9 (578) AND COURSE 24 (316) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 26 (306) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 27 (555) NUMBER OF CONFLICTS= 0

COURSE 9 (578) AND COURSE 28 (547) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 11 (12) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 12 (570) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 13 (571) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 14 (572) NUMBER OF CONFLICTS= 3

COURSE 10 (579) AND COURSE 15 (573) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 16 (19) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 17 (21) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 20 (575) NUMBER OF CONFLICTS= 1

COURSE 10 (579) AND COURSE 21 (577) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 22 (16) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 23 (532) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 24 (316) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 26 (306) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 27 (555) NUMBER OF CONFLICTS= 0

COURSE 10 (579) AND COURSE 28 (547) NUMBER OF CONFLICTS= 0

COURSE 11 (12) AND COURSE 12 (570) NUMBER OF CONFLICTS= 0

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COURSE 11  (  12 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=  9
COURSE 11  (  12 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 15  ( 573 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 16  (  19 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 17  (  21 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 18  ( 320 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 19  ( 321 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 20  ( 575 )  NUMBER OF CONFLICTS=  2
COURSE 11  (  12 )   AND   COURSE 21  ( 577 )  NUMBER OF CONFLICTS=  1
COURSE 11  (  12 )   AND   COURSE 22  (  16 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 23  ( 532 )  NUMBER OF CONFLICTS=  1
COURSE 11  (  12 )   AND   COURSE 24  ( 316 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 25  (   7 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 26  ( 306 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 27  ( 555 )  NUMBER OF CONFLICTS=  0
COURSE 11  (  12 )   AND   COURSE 28  ( 547 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 13  ( 571 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 15  ( 573 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 16  (  19 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 17  (  21 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 18  ( 320 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 19  ( 321 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 20  ( 575 )  NUMBER OF CONFLICTS=  2
COURSE 12  ( 570 )   AND   COURSE 21  ( 577 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 22  (  16 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 23  ( 532 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 24  ( 316 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 25  (   7 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 26  ( 306 )  NUMBER OF CONFLICTS=  1
COURSE 12  ( 570 )   AND   COURSE 27  ( 555 )  NUMBER OF CONFLICTS=  0
COURSE 12  ( 570 )   AND   COURSE 28  ( 547 )  NUMBER OF CONFLICTS=  2
COURSE 13  ( 571 )   AND   COURSE 14  ( 572 )  NUMBER OF CONFLICTS=  0
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COURSE 13 (571) AND COURSE 15 (573) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 16 (19) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 17 (21) NUMBER OF CONFLICTS= 2
COURSE 13 (571) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 20 (575) NUMBER OF CONFLICTS= 4
COURSE 13 (571) AND COURSE 21 (577) NUMBER OF CONFLICTS= 1
COURSE 13 (571) AND COURSE 22 (16) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 23 (532) NUMBER OF CONFLICTS= 6
COURSE 13 (571) AND COURSE 24 (316) NUMBER OF CONFLICTS= 2
COURSE 13 (571) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 26 (306) NUMBER OF CONFLICTS= 0
COURSE 13 (571) AND COURSE 27 (555) NUMBER OF CONFLICTS= 5
COURSE 13 (571) AND COURSE 28 (547) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 15 (573) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 16 (19) NUMBER OF CONFLICTS= 1
COURSE 14 (572) AND COURSE 17 (21) NUMBER OF CONFLICTS= 1
COURSE 14 (572) AND COURSE 18 (320) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 19 (321) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 20 (575) NUMBER OF CONFLICTS= 2
COURSE 14 (572) AND COURSE 21 (577) NUMBER OF CONFLICTS= 1
COURSE 14 (572) AND COURSE 22 (16) NUMBER OF CONFLICTS= 4
COURSE 14 (572) AND COURSE 23 (532) NUMBER OF CONFLICTS= 1
COURSE 14 (572) AND COURSE 24 (316) NUMBER OF CONFLICTS= 2
COURSE 14 (572) AND COURSE 25 (7) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 26 (306) NUMBER OF CONFLICTS= 1
COURSE 14 (572) AND COURSE 27 (555) NUMBER OF CONFLICTS= 0
COURSE 14 (572) AND COURSE 28 (547) NUMBER OF CONFLICTS= 2
COURSE 15 (573) AND COURSE 16 (19) NUMBER OF CONFLICTS= 6
COURSE 15 (573) AND COURSE 17 (21) NUMBER OF CONFLICTS= 2
COURSE 15 (573) AND COURSE 18 (320) NUMBER OF CONFLICTS= 5
COURSE 15 (573) AND COURSE 19 (321) NUMBER OF CONFLICTS= 2
COURSE 15 (573) AND COURSE 20 (575) NUMBER OF CONFLICTS= 4

COURSE 15	(573)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	1
COURSE 15	(573)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	1
COURSE 15	(573)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 15	(573)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	2
COURSE 15	(573)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	1
COURSE 15	(573)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 15	(573)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 15	(573)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 17	(21)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 18	(320)	NUMBER OF CONFLICTS=	10
COURSE 16	(19)	AND	COURSE 19	(321)	NUMBER OF CONFLICTS=	1
COURSE 16	(19)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS=	1
COURSE 16	(19)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	2
COURSE 16	(19)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	1
COURSE 16	(19)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 16	(19)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	1
COURSE 17	(21)	AND	COURSE 18	(320)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 19	(321)	NUMBER OF CONFLICTS=	12
COURSE 17	(21)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS=	2
COURSE 17	(21)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	1
COURSE 17	(21)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	1
COURSE 17	(21)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 17	(21)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 19	(321)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS=	0

COURSE 18	(320)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	1
COURSE 18	(320)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	1
COURSE 18	(320)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 18	(320)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 20	(575)	NUMBER OF CONFLICTS=	1
COURSE 19	(321)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	1
COURSE 19	(321)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 19	(321)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 21	(577)	NUMBER OF CONFLICTS=	1
COURSE 20	(575)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	2
COURSE 20	(575)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 20	(575)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 22	(16)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 24	(316)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 25	(7)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 26	(306)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 27	(555)	NUMBER OF CONFLICTS=	0
COURSE 21	(577)	AND	COURSE 28	(547)	NUMBER OF CONFLICTS=	1
COURSE 22	(16)	AND	COURSE 23	(532)	NUMBER OF CONFLICTS=	0

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[illegible]
COURSE 22 ( 16 )   AND   COURSE 24 ( 316 ) NUMBER OF CONFLICTS=  0
COURSE 22 ( 16 )   AND   COURSE 25 (   7 ) NUMBER OF CONFLICTS=  0
COURSE 22 ( 16 )   AND   COURSE 26 ( 306 ) NUMBER OF CONFLICTS=  1
COURSE 22 ( 16 )   AND   COURSE 27 ( 555 ) NUMBER OF CONFLICTS=  0
COURSE 22 ( 16 )   AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  0
COURSE 23 ( 532 )  AND   COURSE 24 ( 316 ) NUMBER OF CONFLICTS=  0
COURSE 23 ( 532 )  AND   COURSE 25 (   7 ) NUMBER OF CONFLICTS=  0
COURSE 23 ( 532 )  AND   COURSE 26 ( 306 ) NUMBER OF CONFLICTS=  0
COURSE 23 ( 532 )  AND   COURSE 27 ( 555 ) NUMBER OF CONFLICTS=  0
COURSE 23 ( 532 )  AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  0
COURSE 24 ( 316 )  AND   COURSE 25 (   7 ) NUMBER OF CONFLICTS=  0
COURSE 24 ( 316 )  AND   COURSE 26 ( 306 ) NUMBER OF CONFLICTS=  0
COURSE 24 ( 316 )  AND   COURSE 27 ( 555 ) NUMBER OF CONFLICTS=  1
COURSE 24 ( 316 )  AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  1
COURSE 25 (   7 )  AND   COURSE 26 ( 306 ) NUMBER OF CONFLICTS=  0
COURSE 25 (   7 )  AND   COURSE 27 ( 555 ) NUMBER OF CONFLICTS=  0
COURSE 25 (   7 )  AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  0
COURSE 26 ( 306 )  AND   COURSE 27 ( 555 ) NUMBER OF CONFLICTS=  0
COURSE 26 ( 306 )  AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  0
COURSE 27 ( 555 )  AND   COURSE 28 ( 547 ) NUMBER OF CONFLICTS=  0
```

SCHEDULING
LOCKED-IN COURSES

```
   J  1     SCHEDULING COURSE    529       NO CONFLICTS GENERATED
J  1  KT= 6  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))= 1  NH= 0  IKC(KT,N(KT))= 529  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  2     SCHEDULING COURSE    538       NO CONFLICTS GENERATED
J  2  KT= 3  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))= 2  NH= 0  IKC(KT,N(KT))= 538  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  3     SCHEDULING COURSE    540       NO CONFLICTS GENERATED
J  3  KT= 4  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))= 3  NH= 0  IKC(KT,N(KT))= 540  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  4     SCHEDULING COURSE    541       NO CONFLICTS GENERATED
J  4  KT= 4  N(KT)= 2  IKF(KT,N)= 0  IKP(KT,N(KT))= 4  NH= 0  IKC(KT,N(KT))= 541  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  5     SCHEDULING COURSE    550       NO CONFLICTS GENERATED
J  5  KT= 5  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))= 5  NH= 0  IKC(KT,N(KT))= 550  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0


   ***CONFLICT***     STUDENT ID  2109     J=  6      SCHEDULING COURSE   551      TIME KT=  4    CONFLICTING COURSE   541
J  6  KT= 4  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))= 6  NH= 0  IKC(KT,N(KT))= 551  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  7     SCHEDULING COURSE    559       NO CONFLICTS GENERATED
J  7  KT= 6  N(KT)= 2  IKF(KT,N)= 0  IKP(KT,N(KT))= 7  NH= 0  IKC(KT,N(KT))= 559  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  8     SCHEDULING COURSE    561       NO CONFLICTS GENERATED
J  8  KT= 6  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))= 8  NH= 0  IKC(KT,N(KT))= 561  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J  9     SCHEDULING COURSE    578       NO CONFLICTS GENERATED
J  9  KT= 1  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))= 9  NH= 0  IKC(KT,N(KT))= 578  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0

   J 10     SCHEDULING COURSE    579       NO CONFLICTS GENERATED
J 10  KT= 1  N(KT)= 2  IKF(KT,N)= 0  IKP(KT,N(KT))=10  NH= 0  IKC(KT,N(KT))= 579  IKG(KT,N(KT))=   NSEI = 1  NSEM(KT,N(KT))= 0
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***CONFLICT***     STUDENT ID  2001     J= 11     SCHEDULING COURSE    12     TIME KT=  3     CONFLICTING COURSE  538
J 11  KT= 3  N(KT)= 2  IKF(KT,N)= 0  IKP(KT,N(KT))=11  NH= 0  IKC(KT,N(KT))=  12  IKG(KT,N(KT))=   MSE1 = 1  MSEN(KT,N(KT))= 1
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                J 12     COURSE 570      NUMBER OF HOURS 4

                 SCHEDULED AT PERIODS     1     2     3     4

   J 12     SCHEDULING COURSE   570      NO CONFLICTS GENERATED

J 12  KT= 1  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))=12  NH= 3  IKC(KT,N(KT))= 570  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0

   J 12     SCHEDULING COURSE   570      NO CONFLICTS GENERATED

J 12  KT= 2  N(KT)= 1  IKF(KT,N)= 0  IKP(KT,N(KT))=12  NH= 3  IKC(KT,N(KT))= 570  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0

   J 12     SCHEDULING COURSE   570      NO CONFLICTS GENERATED

J 12  KT= 3  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))=12  NH= 3  IKC(KT,N(KT))= 570  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0

   J 12     SCHEDULING COURSE   570      NO CONFLICTS GENERATED

J 12  KT= 4  N(KT)= 4  IKF(KT,N)= 0  IKP(KT,N(KT))=12  NH= 3  IKC(KT,N(KT))= 570  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0


                J 13     COURSE 571      NUMBER OF HOURS 3

                 SCHEDULED AT PERIODS     1     2     3


   ***CONFLICT***     STUDENT ID  2144     J= 13     SCHEDULING COURSE   571     TIME KT=  1     CONFLICTING COURSE   578

J 13  KT= 1  N(KT)= 4  IKF(KT,N)= 0  IKP(KT,N(KT))=13  NH= 2  IKC(KT,N(KT))= 571  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0

   J 13     SCHEDULING COURSE   571      NO CONFLICTS GENERATED

J 13  KT= 2  N(KT)= 2  IKF(KT,N)= 0  IKP(KT,N(KT))=13  NH= 2  IKC(KT,N(KT))= 571  IKG(KT,N(KT))=   HSE1 = 1  HSEM(KT,N(KT))= 0


   ***CONFLICT***     STUDENT ID  2170     J= 13     SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   538
   ***CONFLICT***     STUDENT ID  2181     J= 13     SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   538
   ***CONFLICT***     STUDENT ID  2200     J= 13     SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   538
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   ***CONFLICT***      STUDENT ID  2095      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2119      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2150      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2198      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2262      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2289      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2308      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2332      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12
   ***CONFLICT***      STUDENT ID  2356      J= 13       SCHEDULING COURSE   571     TIME KT=  3     CONFLICTING COURSE   12

J 13  KT= 3  N(KT)= 4  IKF(KT.N)= 0  IKP(KT.N(KT))=13  NH= 2  IKC(KT.N(KT))= 571  IKG(KT.N(KT))=   MSE1 = 1  MSEN(KT.N(KT))= 0


                       J 14     COURSE 572      NUMBER OF HOURS 3

                        SCHEDULED AT PERIODS      4      5      6


   ***CONFLICT***      STUDENT ID  2136      J= 14       SCHEDULING COURSE   572     TIME KT=  4     CONFLICTING COURSE  551

J 14  KT= 4  N(KT)= 5  IKF(KT.N)= 0  IKP(KT.N(KT))=14  NH= 2  IKC(KT.N(KT))= 572  IKG(KT.N(KT))=   MSE1 = 1  MSEN(KT.N(KT))= 0


   ***CONFLICT***      STUDENT ID  2312      J= 14       SCHEDULING COURSE   572     TIME KT=  5     CONFLICTING COURSE  550

J 14  KT= 5  N(KT)= 2  IKF(KT.N)= 0  IKP(KT.N(KT))=14  NH= 2  IKC(KT.N(KT))= 572  IKG(KT.N(KT))=   MSE1 = 1  MSEN(KT.N(KT))= 0


   ***CONFLICT***      STUDENT ID  2071      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  559
   ***CONFLICT***      STUDENT ID  2091      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  559
   ***CONFLICT***      STUDENT ID  2232      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  559
   ***CONFLICT***      STUDENT ID  2263      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  559
   ***CONFLICT***      STUDENT ID  2333      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  559
   ***CONFLICT***      STUDENT ID  2027      J= 14       SCHEDULING COURSE   572     TIME KT=  6     CONFLICTING COURSE  561

J 14  KT= 6  N(KT)= 4  IKF(KT.N)= 0  IKP(KT.N(KT))=14  NH= 2  IKC(KT.N(KT))= 572  IKG(KT.N(KT))=   MSE1 = 1  MSEN(KT.N(KT))= 0


                       J 15     COURSE 573      NUMBER OF HOURS 3

                        SCHEDULED AT PERIODS      1      2      3


   ***CONFLICT***      STUDENT ID  1029      J= 15       SCHEDULING COURSE   573     TIME KT=  1     CONFLICTING COURSE  578

J 15  KT= 1  N(KT)= 5  IKF(KT.N)= 0  IKP(KT.N(KT))=15  NH= 2  IKC(KT.N(KT))= 573  IKG(KT.N(KT))=   MSE1 = 1  MSEN(KT.N(KT))= 0
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J 15     SCHEDULING COURSE   573       NO CONFLICTS GENERATED

J 15  KT= 2  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))=15  NH= 2  IKC(KT,N(KT))= 573  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0


***CONFLICT***      STUDENT ID  1023     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538
***CONFLICT***      STUDENT ID  1064     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538
***CONFLICT***      STUDENT ID  1123     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538
***CONFLICT***      STUDENT ID  1174     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538
***CONFLICT***      STUDENT ID  1189     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538
***CONFLICT***      STUDENT ID  1265     J= 15      SCHEDULING COURSE   573     TIME KT=  3     CONFLICTING COURSE   538

J 15  KT= 3  N(KT)= 5  IKF(KT,N)= 0  IKP(KT,N(KT))=15  NH= 2  IKC(KT,N(KT))= 573  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0
```

SCHEDULING
RESTRICTED
SINGLE-SECTION COURSES

```
MINIMUM COST =          4


        ***CONFLICT***     STUDENT ID  1034     J= 16     SCHEDULING COURSE     19     TIME KT=  4     CONFLICTING COURSE   551
        ***CONFLICT***     STUDENT ID  2245     J= 16     SCHEDULING COURSE     19     TIME KT=  4     CONFLICTING COURSE   572

     J 16  KT= 4  N(KT)= 6  IKF(KT,N)= 0  IKP(KT,N(KT))=16  NH= 0  IKC(KT,N(KT))=  19  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 1


        ***CONFLICT***     STUDENT ID  1184     J= 17     SCHEDULING COURSE     21     TIME KT=  5     CONFLICTING COURSE   550
        ***CONFLICT***     STUDENT ID  2050     J= 17     SCHEDULING COURSE     21     TIME KT=  5     CONFLICTING COURSE   572

     J 17  KT= 5  N(KT)= 3  IKF(KT,N)= 0  IKP(KT,N(KT))=17  NH= 0  IKC(KT,N(KT))=  21  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 1

MINIMUM COST =        -20


        ***CONFLICT***     STUDENT ID  1034     J= 18     SCHEDULING COURSE    320     TIME KT=  4     CONFLICTING COURSE   551

     J 18  KT= 4  N(KT)= 7  IKF(KT,N)= 0  IKP(KT,N(KT))=18  NH= 0  IKC(KT,N(KT))= 320  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 2


        ***CONFLICT***     STUDENT ID  1184     J= 19     SCHEDULING COURSE    321     TIME KT=  5     CONFLICTING COURSE   550

     J 19  KT= 5  N(KT)= 4  IKF(KT,N)= 0  IKP(KT,N(KT))=19  NH= 0  IKC(KT,N(KT))= 321  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 2

MINIMUM COST =          6


        ***CONFLICT***     STUDENT ID  1201     J= 20     SCHEDULING COURSE    575     TIME KT=  6     CONFLICTING COURSE   559
        ***CONFLICT***     STUDENT ID  1105     J= 20     SCHEDULING COURSE    575     TIME KT=  6     CONFLICTING COURSE   561
        ***CONFLICT***     STUDENT ID  2075     J= 20     SCHEDULING COURSE    575     TIME KT=  6     CONFLICTING COURSE   572
        ***CONFLICT***     STUDENT ID  2324     J= 20     SCHEDULING COURSE    575     TIME KT=  6     CONFLICTING COURSE   572

     J 20  KT= 6  N(KT)= 5  IKF(KT,N)= 0  IKP(KT,N(KT))=20  NH= 0  IKC(KT,N(KT))= 575  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0
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***CONFLICT***     STUDENT ID  2234     J= 21     SCHEDULING COURSE   577     TIME KT=  1     CONFLICTING COURSE   571
***CONFLICT***     STUDENT ID  1239     J= 21     SCHEDULING COURSE   577     TIME KT=  1     CONFLICTING COURSE   573

J 21  KT= 1  N(KT)= 6  IKF(KT,N)= 0  IKP(KT,N(KT))=21  NH= 0  IKC(KT,N(KT))= 577  IKG(KT,N(KT))=   MSEI = 1  MSEM(KT,N(KT))= 0
```

SCHEDULING
SINGLE-SECTION COURSES

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   ***CONFLICT***      STUDENT ID  1333      J= 22      SCHEDULING COURSE     16      TIME KT=  2      CONFLICTING COURSE   573

J 22  KT= 2  N(KT)= 4  IKF(KT,N)= 0  IKP(KT,N(KT))=22  NH= 0  IKC(KT,N(KT))=  16  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 1


   ***CONFLICT***      STUDENT ID  2242      J= 23      SCHEDULING COURSE    532      TIME KT=  6      CONFLICTING COURSE   572

J 23  KT= 6  N(KT)= 6  IKF(KT,N)= 0  IKP(KT,N(KT))=23  NH= 0  IKC(KT,N(KT))= 532  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0


   ***CONFLICT***      STUDENT ID  1189      J= 24      SCHEDULING COURSE    316      TIME KT=  3      CONFLICTING COURSE   538
   ***CONFLICT***      STUDENT ID  2081      J= 24      SCHEDULING COURSE    316      TIME KT=  3      CONFLICTING COURSE   571
   ***CONFLICT***      STUDENT ID  2355      J= 24      SCHEDULING COURSE    316      TIME KT=  3      CONFLICTING COURSE   571
   ***CONFLICT***      STUDENT ID  1189      J= 24      SCHEDULING COURSE    316      TIME KT=  3      CONFLICTING COURSE   573
   ***CONFLICT***      STUDENT ID  1245      J= 24      SCHEDULING COURSE    316      TIME KT=  3      CONFLICTING COURSE   573

J 24  KT= 3  N(KT)= 6  IKF(KT,N)= 0  IKP(KT,N(KT))=24  NH= 0  IKC(KT,N(KT))= 316  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 2


   ***CONFLICT***      STUDENT ID  2271      J= 25      SCHEDULING COURSE      7      TIME KT=  5      CONFLICTING COURSE   550

J 25  KT= 5  N(KT)= 5  IKF(KT,N)= 0  IKP(KT,N(KT))=25  NH= 0  IKC(KT,N(KT))=   7  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 1


   ***CONFLICT***      STUDENT ID  1274      J= 26      SCHEDULING COURSE    306      TIME KT=  3      CONFLICTING COURSE   570

J 26  KT= 3  N(KT)= 7  IKF(KT,N)= 0  IKP(KT,N(KT))=26  NH= 0  IKC(KT,N(KT))= 306  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 2


   ***CONFLICT***      STUDENT ID  2349      J= 27      SCHEDULING COURSE    555      TIME KT=  4      CONFLICTING COURSE   551

J 27  KT= 4  N(KT)= 8  IKF(KT,N)= 0  IKP(KT,N(KT))=27  NH= 0  IKC(KT,N(KT))= 555  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0
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***CONFLICT***      STUDENT ID  2100      J= 28      SCHEDULING COURSE   547      TIME KT=  2      CONFLICTING COURSE   570
***CONFLICT***      STUDENT ID  2190      J= 28      SCHEDULING COURSE   547      TIME KT=  2      CONFLICTING COURSE   570

J 28  KT= 2  N(KT)= 5  IKF(KT,N)= 0  IKP(KT,N(KT))=28  NH= 0  IKC(KT,N(KT))= 547  IKG(KT,N(KT))=   MSE1 = 1  MSEM(KT,N(KT))= 0

                                   TOTAL NUMBER OF CONFLICTS = 54
```

TIME PERIODS

	1	2	3	4	5	6
	********	********	********	********	********	********
LOCKED-IN COURSES						
	578	0	538	540	550	529
	579	0	12	541	0	559
	0	0	0	551	0	561
SEVERAL-HOUR COURSES						
	570	570	570	570	0	0
	571	571	571	0	0	0
	0	0	0	572	572	572
	573	573	573	0	0	0
RESTRICTED SINGLE-SECTION COURSES						
	0	0	0	19	21	0
	0	0	0	320	321	0
	577	0	0	0	0	575
SINGLE-SECTION COURSES						
	0	16	316	555	7	532
	0	547	306	0	0	0

```
J= 29     SCHEDULING COURSE   534       NO CONFLICTS GENERATED

J= 29     COURSE=    534   NO. OF STUDENTS = 97     NO. OF SECTIONS = 3    SCHEDULED AT TIME PERIODS  4  5  6
J= 29     KT= 4  N(KT)=  9  IKP(KT,NI)= 29  IKC(KT,NI)= 534  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 29     TIME PERIOD  4   SECTION  1   NO. OF STUDENTS 33        ID OF STUDENTS
                                                             1002  1007  1011  1024
                                                             1035  1046  1057  1061
                                                             1072  1093  1116  1136
                                                             1141  1150  1160  1170
                                                             1181  1193  1196  1215
                                                             1218  1221  1241  1257
                                                             1267  1293  1305  1321
                                                             1336  1340  1346  1355
                                                             2339

J= 29     KT= 5  N(KT)=  6  IKP(KT,NI)= 29  IKC(KT,NI)= 534  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 29     TIME PERIOD  5   SECTION  2   NO. OF STUDENTS 32        ID OF STUDENTS
                                                             1005  1008  1019  1026
                                                             1041  1049  1058  1062
                                                             1089  1108  1125  1138
                                                             1144  1152  1161  1171
                                                             1182  1195  1211  1217
                                                             1226  1231  1249  1266
                                                             1278  1301  1312  1331
                                                             1337  1343  1350  2042

J= 29     KT= 6  N(KT)=  7  IKP(KT,NI)= 29  IKC(KT,NI)= 534  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 29     TIME PERIOD  6   SECTION  3   NO. OF STUDENTS 32        ID OF STUDENTS
                                                             1006  1014  1021  1027
                                                             1048  1050  1091  1094
                                                             1118  1121  1131  1139
                                                             1145  1158  1167  1173
                                                             1191  1212  1213  1216
                                                             1219  1240  1255  1270
                                                             1290  1306  1313  1334
                                                             1338  1348  1352  2314
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J= 30  COURSE 581   CONFLICT  1  CONFLICTING STUDENT ID  1231  REQUEST LIST 534  551  553  559  568  581

J= 30      COURSE=   581    NO. OF STUDENTS = 93    NO. OF SECTIONS = 3    SCHEDULED AT TIME PERIODS  4  5  6
J= 30      KT= 4  N(KT)= 10  IKP(KT,NI)= 30  IKC(KT,NI)= 581  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 30      TIME PERIOD  4   SECTION  1   NO. OF STUDENTS 31        ID OF STUDENTS
                                                              1005  1006  1014  1026
                                                              1027  1048  1049  1062
                                                              1089  1094  1108  1118
                                                              1125  1138  1145  1161
                                                              1167  1191  1211  1212
                                                              1216  1219  1249  1290
                                                              1301  1306  1313  1338
                                                              1343  1352  2314

J= 30      KT= 5  N(KT)=  7  IKP(KT,NI)= 30  IKC(KT,NI)= 581  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 30      TIME PERIOD  5   SECTION  2   NO. OF STUDENTS 31        ID OF STUDENTS
                                                              1002  1011  1021  1024
                                                              1046  1050  1061  1072
                                                              1091  1093  1116  1121
                                                              1131  1139  1158  1160
                                                              1173  1181  1196  1213
                                                              1240  1241  1255  1267
                                                              1270  1305  1334  1336
                                                              1346  1355  2339

J= 30      KT= 6  N(KT)=  8  IKP(KT,NI)= 30  IKC(KT,NI)= 581  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 30      TIME PERIOD  6   SECTION  3   NO. OF STUDENTS 30        ID OF STUDENTS
                                                              1007  1018  1019  1035
                                                              1041  1057  1058  1086
                                                              1136  1141  1144  1150
                                                              1152  1171  1182  1193
                                                              1195  1215  1217  1221
                                                              1226  1257  1266  1293
                                                              1312  1321  1331  1340
                                                              1350  2042
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J= 31   COURSE 568   CONFLICT  1   CONFLICTING STUDENT ID   1002   REQUEST LIST 534   535   557   559   568   581
J= 31   COURSE 568   CONFLICT  2   CONFLICTING STUDENT ID   1005   REQUEST LIST 534   557   559   568   578   581
J= 31   COURSE 568   CONFLICT  3   CONFLICTING STUDENT ID   1006   REQUEST LIST  24   321   531   534   552   568   581
J= 31   COURSE 568   CONFLICT  4   CONFLICTING STUDENT ID   1011   REQUEST LIST 534   535   557   559   568   581
J= 31   COURSE 568   CONFLICT  5   CONFLICTING STUDENT ID   1041   REQUEST LIST   5   306   534   551   557   568   581
J= 31   COURSE 568   CONFLICT  6   CONFLICTING STUDENT ID   1046   REQUEST LIST 531   534   553   561   568   581
J= 31   COURSE 568   CONFLICT  7   CONFLICTING STUDENT ID   1049   REQUEST LIST 531   534   557   559   568   581
J= 31   COURSE 568   CONFLICT  8   CONFLICTING STUDENT ID   1061   REQUEST LIST 534   548   553   559   568   581
J= 31   COURSE 568   CONFLICT  9   CONFLICTING STUDENT ID   1062   REQUEST LIST 530   534   557   559   568   581
J= 31   COURSE 568   CONFLICT 10   CONFLICTING STUDENT ID   1072   REQUEST LIST 530   534   557   559   568   581
J= 31   COURSE 568   CONFLICT 11   CONFLICTING STUDENT ID   1089   REQUEST LIST 531   534   553   561   568   581
J= 31   COURSE 568   CONFLICT 12   CONFLICTING STUDENT ID   1093   REQUEST LIST   5   306   534   552   559   568   581
J= 31   COURSE 568   CONFLICT 13   CONFLICTING STUDENT ID   1108   REQUEST LIST 534   557   564   568   575   581
J= 31   COURSE 568   CONFLICT 14   CONFLICTING STUDENT ID   1116   REQUEST LIST 534   548   557   559   568   581
J= 31   COURSE 568   CONFLICT 15   CONFLICTING STUDENT ID   1125   REQUEST LIST  16   308   534   553   559   568   581
J= 31   COURSE 568   CONFLICT 16   CONFLICTING STUDENT ID   1138   REQUEST LIST 534   548   557   559   568   581
J= 31   COURSE 568   CONFLICT 17   CONFLICTING STUDENT ID   1160   REQUEST LIST   5   324   534   557   559   568   581
J= 31   COURSE 568   CONFLICT 18   CONFLICTING STUDENT ID   1161   REQUEST LIST 531   534   552   561   568   581
J= 31   COURSE 568   CONFLICT 19   CONFLICTING STUDENT ID   1181   REQUEST LIST 534   535   557   559   568   581
J= 31   COURSE 568   CONFLICT 20   CONFLICTING STUDENT ID   1211   REQUEST LIST 534   548   557   559   568   581
J= 31   COURSE 568   CONFLICT 21   CONFLICTING STUDENT ID   1216   REQUEST LIST 534   550   557   564   568   581
J= 31   COURSE 568   CONFLICT 22   CONFLICTING STUDENT ID   1219   REQUEST LIST  21   531   534   557   568   581
J= 31   COURSE 568   CONFLICT 23   CONFLICTING STUDENT ID   1221   REQUEST LIST 534   550   557   560   568   581
J= 31   COURSE 568   CONFLICT 24   CONFLICTING STUDENT ID   1231   REQUEST LIST 534   551   553   559   568   581
J= 31   COURSE 568   CONFLICT 25   CONFLICTING STUDENT ID   1241   REQUEST LIST 534   548   557   559   568   581
J= 31   COURSE 568   CONFLICT 26   CONFLICTING STUDENT ID   1249   REQUEST LIST 534   546   553   561   568   581
J= 31   COURSE 568   CONFLICT 27   CONFLICTING STUDENT ID   1255   REQUEST LIST   5   323   534   551   557   568   581
J= 31   COURSE 568   CONFLICT 28   CONFLICTING STUDENT ID   1267   REQUEST LIST 534   535   557   559   568   581
J= 31   COURSE 568   CONFLICT 29   CONFLICTING STUDENT ID   1270   REQUEST LIST 531   534   551   557   568   581
J= 31   COURSE 568   CONFLICT 30   CONFLICTING STUDENT ID   1305   REQUEST LIST 534   548   557   559   568   581
J= 31   COURSE 568   CONFLICT 31   CONFLICTING STUDENT ID   1346   REQUEST LIST 534   557   564   568   575   581

J= 31      COURSE=    568   NO. OF STUDENTS = 95    NO. OF SECTIONS = 3    SCHEDULED AT TIME PERIODS  4  5  6
J= 31      KT= 4  N(KT)= 11  IKP(KT,NI)= 31  IKC(KT,NI)= 568  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 31      TIME PERIOD  4   SECTION  1   NO. OF STUDENTS 28         ID OF STUDENTS
                                                            1008  1019  1021  1050
                                                            1056  1086  1091  1121
                                                            1131  1139  1144  1152
                                                            1158  1171  1173  1182
                                                            1195  1213  1217  1226
                                                            1240  1266  1312  1331
                                                            1334  1348  1350  2042


J= 31      KT= 5  N(KT)=  8  IKP(KT,NI)= 31  IKC(KT,NI)= 568  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 31      TIME PERIOD  5   SECTION  2   NO. OF STUDENTS 27         ID OF STUDENTS
                                                            1007  1014  1027  1035
                                                            1048  1057  1094  1118
                                                            1136  1141  1145  1150
                                                            1167  1191  1193  1212
                                                            1215  1257  1290  1293
                                                            1306  1313  1321  1338
                                                            1340  1352  2314


J= 31      KT= 6  N(KT)=  9  IKP(KT,NI)= 31  IKC(KT,NI)= 568  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 31      TIME PERIOD  6   SECTION  3   NO. OF STUDENTS  9         ID OF STUDENTS
                                                            1024  1026  1278  1301
                                                            1336  1343  1355  2149
                                                            2339
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J= 32  COURSE 530   CONFLICT  1  CONFLICTING STUDENT ID  1015  REQUEST LIST 530  546  570

J= 32     COURSE=   530   NO. OF STUDENTS = 65    NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  1  4
J= 32     KT= 1  N(KT)=  7  IKP(KT,NI)= 32  IKC(KT,NI)= 530  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 32     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 32         ID OF STUDENTS
                                                               1008  1021  1036  1057
                                                               1058  1062  1072  1083
                                                               1090  1121  1141  1156
                                                               1177  1183  1187  1195
                                                               1200  1233  1234  1260
                                                               1261  1276  1301  1331
                                                               1334  2011  2166  2183
                                                               2208  2223  2293  2314

J= 32     KT= 4  N(KT)= 12  IKP(KT,NI)= 32  IKC(KT,NI)= 530  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 32     TIME PERIOD  4   SECTION  2   NO. OF STUDENTS 32         ID OF STUDENTS
                                                               1029  1031  1043  1065
                                                               1069  1074  1076  1087
                                                               1102  1142  1149  1168
                                                               1179  1188  1198  1205
                                                               1222  1236  1247  1259
                                                               1295  1311  1323  1339
                                                               1349  2084  2168  2202
                                                               2215  2260  2352  2354

J= 33  COURSE   5   CONFLICT  1  CONFLICTING STUDENT ID  1210  REQUEST LIST   5  307  570  575

J= 33     COURSE=     5   NO. OF STUDENTS = 49    NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  3  6
J= 33     KT= 3  N(KT)=  8  IKP(KT,NI)= 33  IKC(KT,NI)=   5  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 33     TIME PERIOD  3   SECTION  1   NO. OF STUDENTS 28         ID OF STUDENTS
                                                               1039  1041  1093  1094
                                                               1096  1135  1160  1175
                                                               1226  1255  1257  1282
                                                               1290  1306  1312  1313
                                                               1324  1335  1340  1352
                                                               2022  2032  2054  2066
                                                               2175  2176  2310  2328

J= 33     KT= 6  N(KT)= 10  IKP(KT,NI)= 33  IKC(KT,NI)=   5  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 33     TIME PERIOD  6   SECTION  2   NO. OF STUDENTS 20         ID OF STUDENTS
                                                               1090  1100  1107  1148
                                                               1156  1197  1243  1274
                                                               1279  1286  1288  1330
                                                               1342  1342  1345  2121
                                                               2137  2161  2209  2351
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J= 34     SCHEDULING COURSE   562      NC CCNFLICTS GENERATED

J= 34     COURSE=   562   NO. OF STUDENTS =  7    NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  2  4
J= 34     KT= 2  N(KT)=  6  IKP(KT,NI)= 34  IKC(KT,NI)= 562  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 34     TIME PERIOD  2   SECTION  1   NO. OF STUDENTS  5        ID OF STUDENTS
                                                            1050  1242  1293  2054
                                                            2147

J= 34     KT= 4  N(KT)= 13  IKP(KT,NI)= 34  IKC(KT,NI)= 562  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 34     TIME PERIOD  4   SECTION  2   NO. OF STUDENTS  2        ID OF STUDENTS
                                                            1164  2311


J= 35  COURSE 564   CONFLICT  1  CONFLICTING STUDENT ID  1195  REQUEST LIST 530  534  557  564  568  581
J= 35  COURSE 564   CONFLICT  2  CONFLICTING STUDENT ID  2208  REQUEST LIST 530  564  565  572

J= 35     COURSE=   564   NO. OF STUDENTS = 47    NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  1  5
J= 35     KT= 1  N(KT)=  8  IKP(KT,NI)= 35  IKC(KT,NI)= 564  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 35     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 22        ID OF STUDENTS
                                                            1012  1039  1042  1091
                                                            1094  1100  1126  1216
                                                            1217  1278  1332  1346
                                                            2032  2107  2128  2157
                                                            2201  2205  2239  2281
                                                            2291  2305

J= 35     KT= 5  N(KT)=  9  IKP(KT,NI)= 35  IKC(KT,NI)= 564  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 35     TIME PERIOD  5   SECTION  2   NO. OF STUDENTS 23        ID OF STUDENTS
                                                            1031  1097  1111  1124
                                                            1194  1230  1238  1246
                                                            1252  1264  1283  1351
                                                            2086  2126  2167  2179
                                                            2204  2234  2257  2262
                                                            2280  2332  2358


J= 36  COURSE 546   CONFLICT  1  CONFLICTING STUDENT ID  1110  REQUEST LIST 546  558  573  575
J= 36  COURSE 546   CONFLICT  2  CONFLICTING STUDENT ID  1312  REQUEST LIST   5  324  534  546  557  568  581

J= 36     COURSE=   546   NO. OF STUDENTS = 43    NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  3  6
J= 36     KT= 3  N(KT)=  9  IKP(KT,NI)= 36  IKC(KT,NI)= 546  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 36     TIME PERIOD  3   SECTION  1   NO. OF STUDENTS 22        ID OF STUDENTS
                                                            1001  1027  1035  1038
                                                            1080  1112  1130  1131
                                                            1136  1145  1147  1167
                                                            1173  1182  1193  1199
                                                            1213  1249  1278  1288
                                                            1301  1331

J= 36     KT= 6  N(KT)= 11  IKP(KT,NI)= 36  IKC(KT,NI)= 546  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 36     TIME PERIOD  6   SECTION  2   NO. OF STUDENTS 19        ID OF STUDENTS
                                                            1015  1033  1036  1045
                                                            1083  1096  1106  1111
                                                            1155  1176  1178  1194
                                                            1218  1222  1236  1298
                                                            1300  2135  2284
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J= 37  COURSE 324    CONFLICT  1  CONFLICTING STUDENT ID  1091  REQUEST LIST   8  324  534  557  564  568  581
J= 37  COURSE 324    CONFLICT  2  CONFLICTING STUDENT ID  1094  REQUEST LIST   5  324  534  557  564  568  581

J= 37      COURSE=    324    NO. OF STUDENTS = 32     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  1  4
J= 37      KT= 1  N(KT)=  9  IKP(KT,NI)= 37  IKC(KT,NI)= 324  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 37      TIME PERIOD  1    SECTION  1    NO. OF STUDENTS 15          ID OF STUDENTS
                                                              1014  1075  1160  1169
                                                              1240  1257  1279  1288
                                                              1312  1313  1343  2054
                                                              2151  2216  2240

J= 37      KT= 4  N(KT)= 14  IKP(KT,NI)= 37  IKC(KT,NI)= 324  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 37      TIME PERIOD  4    SECTION  2    NO. OF STUDENTS 15          ID OF STUDENTS
                                                              1030  1112  1148  1156
                                                              1174  1206  1282  1286
                                                              1330  2058  2145  2167
                                                              2174  2211  2266

J= 38  COURSE  24    CONFLICT  1  CONFLICTING STUDENT ID  1246  REQUEST LIST  24  308  558  564  573

J= 38      COURSE=    24    NO. OF STUDENTS = 36     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  1  5
J= 38      KT= 1  N(KT)= 10  IKP(KT,NI)= 38  IKC(KT,NI)=  24  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 38      TIME PERIOD  1    SECTION  1    NO. OF STUDENTS 18          ID OF STUDENTS
                                                              1040  1045  1142  1166
                                                              1272  1316  2015  2017
                                                              2063  2077  2133  2147
                                                              2148  2179  2217  2252
                                                              2282  2334

J= 38      KT= 5  N(KT)= 10  IKP(KT,NI)= 38  IKC(KT,NI)=  24  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 38      TIME PERIOD  5    SECTION  2    NO. OF STUDENTS 17          ID OF STUDENTS
                                                              1006  1077  1162  1189
                                                              1304  1319  1320  1328
                                                              2040  2093  2125  2128
                                                              2140  2194  2219  2261
                                                              2315

J= 39      SCHEDULING COURSE    305       NO CONFLICTS GENERATED

J= 39      COURSE=   305    NO. OF STUDENTS = 20     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  2  5
J= 39      KT= 2  N(KT)=  7  IKP(KT,NI)= 39  IKC(KT,NI)= 305  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 39      TIME PERIOD  2    SECTION  1    NO. OF STUDENTS  9          ID OF STUDENTS
                                                              1045  1277  2010  2034
                                                              2043  2082  2159  2253

J= 39      KT= 5  N(KT)= 11  IKP(KT,NI)= 39  IKC(KT,NI)= 305  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 39      TIME PERIOD  5    SECTION  2    NO. OF STUDENTS 12          ID OF STUDENTS
                                                              1224  2031  2039  2045
                                                              2067  2104  2106  2190
                                                              2194  2214  2296  2303
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J= 40  COURSE   8   CONFLICT  1  CONFLICTING STUDENT ID  1172  REQUEST LIST   8  540  557  573
J= 40  COURSE   8   CONFLICT  2  CONFLICTING STUDENT ID  2269  REQUEST LIST   8  309  550  555  571
J= 40  COURSE   8   CONFLICT  3  CONFLICTING STUDENT ID  2311  REQUEST LIST   8  309  556  562  571

J= 40     COURSE=     8   NO. OF STUDENTS = 49     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  3  4
J= 40     KT= 3  N(KT)= 10  IKP(KT,NI)= 40  IKC(KT,NI)=   8  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 40     TIME PERIOD  3   SECTION  1   NO. OF STUDENTS 23        ID OF STUDENTS
                                                         1014  1067  1075  1091
                                                         1121  1191  1228  1277
                                                         1284  1343  2010  2062
                                                         2087  2117  2151  2182
                                                         2194  2232  2236  2254
                                                         2263  2281  2288

J= 40     KT= 4  N(KT)= 15  IKP(KT,NI)= 40  IKC(KT,NI)=   8  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 40     TIME PERIOD  4   SECTION  2   NO. OF STUDENTS 23        ID OF STUDENTS
                                                         1030  1056  1146  1169
                                                         1206  1224  1245  1344
                                                         2002  2007  2049  2065
                                                         2069  2144  2161  2181
                                                         2203  2237  2247  2266
                                                         2276  2284  2292

J= 41  COURSE 308   CONFLICT  1  CONFLICTING STUDENT ID  1333  REQUEST LIST  16   19  308  320  558  573
J= 41  COURSE 308   CONFLICT  2  CONFLICTING STUDENT ID  2034  REQUEST LIST   9  305  308  323  572
J= 41  COURSE 308   CONFLICT  3  CONFLICTING STUDENT ID  2277  REQUEST LIST   9  308  543  555  571

J= 41     COURSE=   308   NO. OF STUDENTS = 57     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  2  4
J= 41     KT= 2  N(KT)=  8  IKP(KT,NI)= 41  IKC(KT,NI)= 308  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 41     TIME PERIOD  2   SECTION  1   NO. OF STUDENTS 27        ID OF STUDENTS
                                                         1040  1079  1104  1125
                                                         1132  1152  1292  1316
                                                         1334  1342  1342  1345
                                                         2038  2048  2077  2115
                                                         2149  2157  2165  2169
                                                         2199  2210  2241  2242
                                                         2251  2299  2309

J= 41     KT= 4  N(KT)= 16  IKP(KT,NI)= 41  IKC(KT,NI)= 308  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 41     TIME PERIOD  4   SECTION  2   NO. OF STUDENTS 27        ID OF STUDENTS
                                                         1077  1100  1103  1129
                                                         1166  1197  1246  1254
                                                         1303  1304  1319  2016
                                                         2024  2072  2107  2112
                                                         2131  2178  2192  2196
                                                         2207  2212  2243  2246
                                                         2268  2274  2338
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J= 42  COURSE 323   CONFLICT  1  CONFLICTING STUDENT ID  1328  REQUEST LIST  24  323  540  558  573

J= 42      COURSE=    323   NO. OF STUDENTS = 35     NO. OF SECTIONS = 2     SCHEDULED AT TIME PERIODS  3  4
J= 42      KT= 3  N(KT)= 11  IKP(KT,NI)= 42  IKC(KT,NI)= 323  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 42      TIME PERIOD  3    SECTION  1   NO. OF STUDENTS 18         ID OF STUDENTS
                                                              1090  1107  1121  1139
                                                              1226  1228  1255  1306
                                                              2034  2141  2185  2223
                                                              2279  2282  2318  2322
                                                              2340  2348

J= 42      KT= 4  N(KT)= 17  IKP(KT,NI)= 42  IKC(KT,NI)= 323  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 42      TIME PERIOD  4    SECTION  2   NO. OF STUDENTS 16         ID OF STUDENTS
                                                              1054  1146  1244  1344
                                                              2007  2019  2025  2057
                                                              2137  2161  2193  2231
                                                              2247  2283  2284  2359


J= 43      SCHEDULING COURSE     23       NO CONFLICTS GENERATED

J= 43      COURSE=     23   NO. OF STUDENTS = 24     NO. OF SECTIONS = 2     SCHEDULED AT TIME PERIODS  2  4
J= 43      KT= 2  N(KT)=  9  IKP(KT,NI)= 43  IKC(KT,NI)=  23  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 43      TIME PERIOD  2    SECTION  1   NO. OF STUDENTS 12         ID OF STUDENTS
                                                              1024, 1104  1132  1152
                                                              1257  1292  1334  2093
                                                              2136  2267  2306  2329

J= 43      KT= 4  N(KT)= 18  IKP(KT,NI)= 43  IKC(KT,NI)=  23  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 43      TIME PERIOD  4    SECTION  2   NO. OF STUDENTS 12         ID OF STUDENTS
                                                              1073  1254  2003  2028
                                                              2033  2035  2046  2110
                                                              2138  2300  2325  2335
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J= 44  COURSE 309   CONFLICT  1  CONFLICTING STUDENT ID  2269  REQUEST LIST   8  309  550  555  571
J= 44  COURSE 309   CONFLICT  2  CONFLICTING STUDENT ID  2311  REQUEST LIST   8  309  556  562  571

J= 44      COURSE=    309   NO. OF STUDENTS =133    NO. OF SECTIONS = 4    SCHEDULED AT TIME PERIODS  1  2  3  4
J= 44      KT= 1  N(KT)= 11  IKP(KT,NI)= 44  IKC(KT,NI)= 309  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 44      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 30          ID OF STUDENTS
                                                                2001  2015  2017  2037
                                                                2050  2060  2063  2077
                                                                2097  2105  2121  2133
                                                                2148  2161  2179  2209
                                                                2217  2229  2235  2249
                                                                2252  2265  2271  2307
                                                                2312  2323  2326  2330
                                                                2334  2360

J= 44      KT= 2  N(KT)= 10  IKP(KT,NI)= 44  IKC(KT,NI)= 309  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 44      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 29          ID OF STUDENTS
                                                                2018  2021  2027  2040
                                                                2052  2064  2074  2093
                                                                2101  2120  2122  2134
                                                                2136  2151  2158  2219
                                                                2226  2227  2239  2245
                                                                2256  2260  2267  2293
                                                                2306  2313  2327  2329
                                                                2351

J= 44      KT= 3  N(KT)= 12  IKP(KT,NI)= 44  IKC(KT,NI)= 309  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 44      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 30          ID OF STUDENTS
                                                                2006  2009  2022  2032
                                                                2059  2062  2090  2092
                                                                2094  2117  2127  2164
                                                                2171  2175  2176  2182
                                                                2194  2220  2232  2236
                                                                2261  2263  2281  2288
                                                                2291  2310  2316  2328
                                                                2345  2353

J= 44      KT= 4  N(KT)= 19  IKP(KT,NI)= 44  IKC(KT,NI)= 309  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 44      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 42          ID OF STUDENTS
                                                                2002  2003  2008  2014
                                                                2028  2029  2033  2035
                                                                2041  2046  2049  2065
                                                                2069  2076  2095  2099
                                                                2110  2119  2124  2125
                                                                2136  2140  2144  2150
                                                                2181  2198  2203  2225
                                                                2237  2258  2262  2276
                                                                2289  2292  2300  2304
                                                                2308  2315  2325  2332
                                                                2356  2361
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J= 45  COURSE   9   CONFLICT  1  CONFLICTING STUDENT ID  2076  REQUEST LIST   9  325  570  575
J= 45  COURSE   9   CONFLICT  2  CONFLICTING STUDENT ID  2100  REQUEST LIST   9  325  547  570
J= 45  COURSE   9   CONFLICT  3  CONFLICTING STUDENT ID  2104  REQUEST LIST   9  305  570  585
J= 45  COURSE   9   CONFLICT  4  CONFLICTING STUDENT ID  2106  REQUEST LIST   9  305  570  585
J= 45  COURSE   9   CONFLICT  5  CONFLICTING STUDENT ID  2190  REQUEST LIST   9  305  547  579
J= 45  COURSE   9   CONFLICT  6  CONFLICTING STUDENT ID  2277  REQUEST LIST   9  308  543  555  571
J= 45  COURSE   9   CONFLICT  7  CONFLICTING STUDENT ID  2296  REQUEST LIST   9  305  549  570
J= 45  COURSE   9   CONFLICT  8  CONFLICTING STUDENT ID  2297  REQUEST LIST   9  399  555  559  571
J= 45  COURSE   9   CONFLICT  9  CONFLICTING STUDENT ID  2302  REQUEST LIST   9  385  548  570
J= 45  COURSE   9   CONFLICT 10  CONFLICTING STUDENT ID  2303  REQUEST LIST   9  305  548  570

J= 45     COURSE=     9   NO. OF STUDENTS = 98    NO. OF SECTIONS = 4    SCHEDULED AT TIME PERIODS  1  2  3  4
J= 45     KT= 1  N(KT)= 12  IKP(KT,NI)= 45  IKC(KT,NI)=   9  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 45     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 16          ID OF STUDENTS
                                                              2013  2039  2044  2067
                                                              2083  2111  2135  2168
                                                              2184  2206  2215  2216
                                                              2240  2275  2290  2301

J= 45     KT= 2  N(KT)= 11  IKP(KT,NI)= 45  IKC(KT,NI)=   9  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 45     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 16          ID OF STUDENTS
                                                              2020  2034  2038  2043
                                                              2048  2002  2115  2149
                                                              2159  2195  2210  2241
                                                              2242  2251  2309  2357

J= 45     KT= 3  N(KT)= 13  IKP(KT,NI)= 45  IKC(KT,NI)=   9  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 45     TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 22          ID OF STUDENTS
                                                              2026  2036  2045  2079
                                                              2085  2089  2141  2162
                                                              2188  2214  2222  2223
                                                              2238  2279  2282  2286
                                                              2318  2322  2340  2346
                                                              2348  2349

J= 45     KT= 4  N(KT)= 20  IKP(KT,NI)= 45  IKC(KT,NI)=   9  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 45     TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 34          ID OF STUDENTS
                                                              2016  2019  2024  2025
                                                              2031  2050  2072  2081
                                                              2080  2098  2107  2112
                                                              2131  2145  2167  2174
                                                              2178  2192  2193  2196
                                                              2207  2211  2212  2228
                                                              2231  2243  2246  2268
                                                              2274  2283  2338  2355
                                                              2358  2359
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J= 46  COURSE 553   CONFLICT  1  CONFLICTING STUDENT ID  1077  REQUEST LIST  24  308  531  553  573
J= 46  COURSE 553   CONFLICT  2  CONFLICTING STUDENT ID  1148  REQUEST LIST   5  324  531  553  573
J= 46  COURSE 553   CONFLICT  3  CONFLICTING STUDENT ID  1309  REQUEST LIST  24  308  553  559  573

J= 46     COURSE=   553   NO. OF STUDENTS =102    NO. OF SECTIONS = 4    SCHEDULED AT TIME PERIODS  1  2  3  4
J= 46     KT= 1  N(KT)= 13  IKP(KT,NI)= 46  IKC(KT,NI)= 553  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 46     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 25       ID OF STUDENTS
                                                              1009  1020  1038  1054
                                                              1065  1085  1095  1103
                                                              1125  1136  1139  1159
                                                              1179  1205  1218  1243
                                                              1249  1268  1280  1284
                                                              1290  1306  1321  1342
                                                              1355

J= 46     KT= 2  N(KT)= 12  IKP(KT,NI)= 46  IKC(KT,NI)= 553  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 46     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 25       ID OF STUDENTS
                                                              1010  1014  1046  1061
                                                              1073  1087  1097  1105
                                                              1127  1137  1155  1156
                                                              1187  1207  1224  1234
                                                              1261  1269  1276  1287
                                                              1294  1313  1323  1343
                                                              1351

J= 46     KT= 3  N(KT)= 14  IKP(KT,NI)= 46  IKC(KT,NI)= 553  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 46     TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 25       ID OF STUDENTS
                                                              1016  1018  1047  1066
                                                              1082  1089  1101  1115
                                                              1129  1140  1152  1166
                                                              1183  1215  1231  1252
                                                              1262  1275  1281  1289
                                                              1302  1316  1339  1342
                                                              2080

J= 46     KT= 4  N(KT)= 21  IKP(KT,NI)= 46  IKC(KT,NI)= 553  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 46     TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 24     . ID OF STUDENTS
                                                              1003  1028  1033  1083
                                                              1088  1090  1104  1126
                                                              1132  1147  1180  1230
                                                              1232  1235  1237  1260
                                                              1265  1277  1283  1288
                                                              1307  1317  1341  1345
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J= 47  COURSE 549   CONFLICT  1  CONFLICTING STUDENT ID  2141  REQUEST LIST   9  323  549  566  572

J= 47     COURSE=    549   NO. OF STUDENTS = 32     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  3  6
J= 47     KT= 3  N(KT)= 15  IKP(KT,NI)= 47  IKC(KT,NI)= 549  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 47     TIME PERIOD  3   SECTION  1   NO. OF STUDENTS 16         ID OF STUDENTS
                                                            2003  2035  2044  2064
                                                            2116  2121  2132  2149
                                                            2160  2186  2197  2206
                                                            2272  2298  2317  2334

J= 47     KT= 6  N(KT)= 12  IKP(KT,NI)= 47  IKC(KT,NI)= 549  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 47     TIME PERIOD  6   SECTION  2   NO. OF STUDENTS 15         ID OF STUDENTS
                                                            2011  2024  2085  2101
                                                            2138  2191  2225  2243
                                                            2250  2259  2267  2275
                                                            2296  2300  2322

J= 48  COURSE 548   CONFLICT  1  CONFLICTING STUDENT ID  1032  REQUEST LIST 548  550  558  573
J= 48  COURSE 548   CONFLICT  2  CONFLICTING STUDENT ID  1313  REQUEST LIST   5  324  534  548  553  568  581
J= 48  COURSE 548   CONFLICT  3  CONFLICTING STUDENT ID  1343  REQUEST LIST   8  324  534  548  553  568  581
J= 48  COURSE 548   CONFLICT  4  CONFLICTING STUDENT ID  2303  REQUEST LIST   9  305  548  570

J= 48     COURSE=    548   NO. OF STUDENTS = 83     NO. OF SECTIONS = 3    SCHEDULED AT TIME PERIODS  1  2  5
J= 48     KT= 1  N(KT)= 14  IKP(KT,NI)= 48  IKC(KT,NI)= 548  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 48     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 27         ID OF STUDENTS
                                                            1010  1019  1028  1061
                                                            1078  1113  1118  1128
                                                            1138  1144  1152  1162
                                                            1204  1214  1215  1226
                                                            1241  1273  1285  1294
                                                            1305  1329  1338  2020
                                                            2091  2120  2348

J= 48     KT= 2  N(KT)= 13  IKP(KT,NI)= 48  IKC(KT,NI)= 548  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 48     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 26         ID OF STUDENTS
                                                            1008  1026  1051  1057
                                                            1084  1116  1120  1129
                                                            1140  1150  1168  1171
                                                            1211  1212  1223  1229
                                                            1247  1284  1290  1299
                                                            1307  1321  1350  2087
                                                            2283  2344

J= 48     KT= 5  N(KT)= 12  IKP(KT,NI)= 48  IKC(KT,NI)= 548  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 48     TIME PERIOD  5   SECTION  3   NO. OF STUDENTS 26         ID OF STUDENTS
                                                            1003  1004  1060  1074
                                                            1101  1117  1122  1132
                                                            1155  1163  1170  1179
                                                            1207  1220  1228  1243
                                                            1248  1263  1292  1302
                                                            1326  1344  1354  2153
                                                            2294  2302
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J= 49  COURSE 560   CONFLICT  1  CONFLICTING STUDENT ID  2315  REQUEST LIST  24  309  558  560  571

J= 49     COURSE=    560   NO. OF STUDENTS = 45     NO. OF SECTIONS = 2    SCHEDULED AT TIME PERIODS  1  2
J= 49     KT= 1  N(KT)= 15  IKP(KT,NI)= 49  IKC(KT,NI)= 560  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 49     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 22          ID OF STUDENTS
                                                              1017  1107  1170  1191
                                                              1221  1271  1317  1323
                                                              1330  1350  1352  2012
                                                              2016  2023  2033  2066
                                                              2160  2186  2219  2241
                                                              2329  2339

J= 49     KT= 2  N(KT)= 14  IKP(KT,NI)= 49  IKC(KT,NI)= 560  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 49     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 22          ID OF STUDENTS
                                                              1028  1086  1128  1136
                                                              1144  1159  1214  1215
                                                              1251  1285  1306  1327
                                                              1329  2026  2042  2127
                                                              2184  2197  2264  2324
                                                              2330  2337
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J= 50  COURSE 557   CONFLICT  1  CONFLICTING STUDENT ID  1008  REQUEST LIST 530  534  548  557  568  581
J= 50  COURSE 557   CONFLICT  2  CONFLICTING STUDENT ID  1024  REQUEST LIST  23  399  534  557  568  578  581
J= 50  COURSE 557   CONFLICT  3  CONFLICTING STUDENT ID  1144  REQUEST LIST 534  548  557  560  568  581
J= 50  COURSE 557   CONFLICT  4  CONFLICTING STUDENT ID  1158  REQUEST LIST 534  548  557  568  578  581
J= 50  COURSE 557   CONFLICT  5  CONFLICTING STUDENT ID  1171  REQUEST LIST 534  548  557  560  578  581
J= 50  COURSE 557   CONFLICT  6  CONFLICTING STUDENT ID  1212  REQUEST LIST 534  548  557  568  578  581
J= 50  COURSE 557   CONFLICT  7  CONFLICTING STUDENT ID  1257  REQUEST LIST   5   23  306  324  534  557  568  581
J= 50  COURSE 557   CONFLICT  8  CONFLICTING STUDENT ID  1293  REQUEST LIST 534  557  562  568  577  581
J= 50  COURSE 557   CONFLICT  9  CONFLICTING STUDENT ID  1334  REQUEST LIST  23  308  530  534  557  568  581
J= 50  COURSE 557   CONFLICT 10  CONFLICTING STUDENT ID  1350  REQUEST LIST 534  548  557  560  568  581

J= 50     COURSE=   557   NO. OF STUDENTS =119    NO. OF SECTIONS = 4    SCHEDULED AT TIME PERIODS  1  2  5  6
J= 50     KT= 1  N(KT)= 16  IKP(KT,NI)= 50  IKC(KT,NI)= 557  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 50     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 28         ID OF STUDENTS
                                                            1002  1007  1026  1035
                                                            1041  1048  1050  1116
                                                            1131  1145  1150  1173
                                                            1181  1193  1203  1211
                                                            1213  1219  1255  1266
                                                            1267  1270  1336  1337
                                                            1340  2042  2185  2204

J= 50     KT= 2  N(KT)= 15  IKP(KT,NI)= 50  IKC(KT,NI)= 557  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 50     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 38         ID OF STUDENTS
                                                            1005  1011  1019  1021
                                                            1027  1049  1058  1062
                                                            1072  1091  1094  1108
                                                            1118  1121  1138  1141
                                                            1160  1167  1182  1191
                                                            1195  1196  1216  1217
                                                            1221  1226  1240  1241
                                                            1278  1301  1305  1312
                                                            1331  1338  1346  1352
                                                            2314  2339

J= 50     KT= 5  N(KT)= 13  IKP(KT,NI)= 50  IKC(KT,NI)= 557  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 50     TIME PERIOD  5   SECTION  3   NO. OF STUDENTS 26         ID OF STUDENTS
                                                            1036  1045  1055  1081
                                                            1086  1096  1120  1149
                                                            1172  1183  1198  1202
                                                            1208  1259  1271  1273
                                                            1282  1300  1303  1330
                                                            1347  1348  2012  2352
                                                            2359  2361

J= 50     KT= 6  N(KT)= 13  IKP(KT,NI)= 50  IKC(KT,NI)= 557  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 50     TIME PERIOD  6   SECTION  4   NO. OF STUDENTS 17         ID OF STUDENTS
                                                            1068  1074  1080  1098
                                                            1124  1128  1135  1170
                                                            1177  1184  1204  1214
                                                            1233  1238  1248  1285
                                                            1327
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J= 51  COURSE 531   CONFLICT  1  CONFLICTING STUDENT ID  1077  REQUEST LIST  24  308  531  653  573
J= 51  COURSE 531   CONFLICT  2  CONFLICTING STUDENT ID  1304  REQUEST LIST  24  308  531  652  573

J= 51      COURSE=   531   NO. OF STUDENTS =161    NO. OF SECTIONS = 4    SCHEDULED AT TIME PERIODS  2  3  4  5
J= 51      KT= 2  N(KT)= 16  IKP(KT,NI)= 51  IKC(KT,NI)= 531  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 51      TIME PERIOD  2   SECTION  1   NO. OF STUDENTS 40          ID OF STUDENTS
                                                                 1006  1016  1030  1035
                                                                 1038  1047  1066  1080
                                                                 1082  1089  1102  1114
                                                                 1130  1131  1139  1145
                                                                 1173  1213  1219  1230
                                                                 1252  1266  1279  1300
                                                                 1332  1336  1349  1355
                                                                 2032  2036  2086  2137
                                                                 2162  2172  2205  2214
                                                                 2236  2285  2323  2353

J= 51      KT= 3  N(KT)= 16  IKP(KT,NI)= 51  IKC(KT,NI)= 531  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 51      TIME PERIOD  3   SECTION  2   NO. OF STUDENTS 40          ID OF STUDENTS
                                                                 1007  1017  1019  1021
                                                                 1040  1046  1049  1050
                                                                 1058  1098  1103  1118
                                                                 1137  1161  1183  1208
                                                                 1217  1218  1224  1232
                                                                 1268  1270  1287  1309
                                                                 1341  1342  1342  2002
                                                                 2018  2075  2096  2157
                                                                 2159  2173  2199  2216
                                                                 2253  2307  2347  2351

J= 51      KT= 4  N(KT)= 22  IKP(KT,NI)= 51  IKC(KT,NI)= 531  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 51      TIME PERIOD  4   SECTION  3   NO. OF STUDENTS 39          ID OF STUDENTS
                                                                 1009  1020  1023  1037
                                                                 1044  1055  1063  1081
                                                                 1092  1099  1106  1122
                                                                 1140  1151  1154  1165
                                                                 1190  1225  1238  1250
                                                                 1253  1273  1298  1308
                                                                 1316  1320  1353  2013
                                                                 2051  2079  2133  2152
                                                                 2165  2187  2209  2213
                                                                 2259  2207  2336

J= 51      KT= 5  N(KT)= 14  IKP(KT,NI)= 51  IKC(KT,NI)= 531  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 51      TIME PERIOD  5   SECTION  4   NO. OF STUDENTS 40          ID OF STUDENTS
                                                                 1012  1022  1025  1033
                                                                 1052  1056  1075  1076
                                                                 1085  1100  1109  1127
                                                                 1148  1153  1166  1185
                                                                 1197  1227  1237  1256
                                                                 1265  1275  1277  1314
                                                                 1322  1325  1345  2047
                                                                 2055  2081  2112  2124
                                                                 2130  2189  2191  2218
                                                                 2265  2321  2345  2354
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J= 52  COURSE 558   CONFLICT  1  CONFLICTING STUDENT ID  2099  REQUEST LIST  21  309  558  559  571
J= 52  COURSE 558   CONFLICT  2  CONFLICTING STUDENT ID  2140  REQUEST LIST  24  309  532  558  571

J= 52      COURSE=   558   NO. OF STUDENTS =145    NO. OF SECTIONS = 5    SCHEDULED AT TIME PERIODS  1  3  4  5  6
J= 52      KT= 1  N(KT)= 17  IKP(KT,NI)= 52  IKC(KT,NI)= 558  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 52      TIME PERIOD  1    SECTION  1   NO. OF STUDENTS 28        ID OF STUDENTS
                                                               1092  2002  2006  2009
                                                               2025  2041  2045  2059
                                                               2072  2076  2079  2094
                                                               2122  2155  2159  2175
                                                               2176  2212  2220  2230
                                                               2251  2255  2260  2288
                                                               2316  2318  2345  2351

J= 52      KT= 3  N(KT)= 17  IKP(KT,NI)= 52  IKC(KT,NI)= 558  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 52      TIME PERIOD  3    SECTION  2   NO. OF STUDENTS 27        ID OF STUDENTS
                                                               1057  1332  2007  2015
                                                               2033  2048  2055  2063
                                                               2067  2101  2110  2115
                                                               2148  2163  2165  2178
                                                               2207  2217  2224  2239
                                                               2252  2259  2304  2306
                                                               2321  2331  2360

J= 52      KT= 4  N(KT)= 23  IKP(KT,NI)= 52  IKC(KT,NI)= 558  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 52      TIME PERIOD  4    SECTION  3   NO. OF STUDENTS 28        ID OF STUDENTS
                                                               1032  1110  1134  1186
                                                               1227  1322  1325  1326
                                                               2001  2023  2092  2121
                                                               2129  2142  2143  2173
                                                               2210  2218  2229  2234
                                                               2253  2271  2278  2291
                                                               2323  2328  2350  2353

J= 52      KT= 5  N(KT)= 15  IKP(KT,NI)= 52  IKC(KT,NI)= 558  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 52      TIME PERIOD  5    SECTION  4   NO. OF STUDENTS 33        ID OF STUDENTS
                                                               1059  1063  1164  1245
                                                               1250  1254  1311  1333
                                                               2008  2024  2030  2046
                                                               2084  2095  2144  2150
                                                               2152  2174  2181  2187
                                                               2193  2198  2203  2211
                                                               2225  2237  2276  2284
                                                               2287  2289  2308  2355
                                                               2356

J= 52      KT= 6  N(KT)= 14  IKP(KT,NI)= 52  IKC(KT,NI)= 558  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 52      TIME PERIOD  6    SECTION  5   NO. OF STUDENTS 27        ID OF STUDENTS
                                                               1039  1056  1174  1246
                                                               1263  1320  1328  2004
                                                               2014  2029  2031  2070
                                                               2081  2088  2112  2119
                                                               2124  2125  2130  2192
                                                               2213  2228  2262  2292
                                                               2315  2332  2336
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```
J= 53      SCHEDULING COURSE   556      NO CONFLICTS GENERATED

J= 53      COURSE=   556   NO. OF STUDENTS = 90    NO. OF SECTIONS = 5    SCHEDULED AT TIME PERIODS  1  2  3  4  6
J= 53      KT= 1  N(KT)= 18  IKP(KT,NI)= 53  IKC(KT,NI)= 556  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 53      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 18        ID OF STUDENTS
                                                              2003  2028  2051  2058
                                                              2093  2126  2137  2138
                                                              2149  2169  2195  2227
                                                              2256  2261  2283  2294
                                                              2317  2327

J= 53      KT= 2  N(KT)= 17  IKP(KT,NI)= 53  IKC(KT,NI)= 556  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 53      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 18        ID OF STUDENTS
                                                              2011  2037  2047  2083
                                                              2090  2118  2133  2153
                                                              2161  2168  2183  2186
                                                              2222  2272  2275  2290
                                                              2325  2346

J= 53      KT= 3  N(KT)= 18  IKP(KT,NI)= 53  IKC(KT,NI)= 556  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 53      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 18        ID OF STUDENTS
                                                              2016  2038  2057  2105
                                                              2108  2120  2135  2154
                                                              2166  2179  2196  2209
                                                              2246  2267  2280  2293
                                                              2326  2344

J= 53      KT= 4  N(KT)= 24  IKP(KT,NI)= 53  IKC(KT,NI)= 556  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 53      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 18        ID OF STUDENTS
                                                              2005  2039  2060  2085
                                                              2111  2127  2139  2146
                                                              2164  2182  2201  2219
                                                              2250  2273  2279  2309
                                                              2334  2357

J= 53      KT= 6  N(KT)= 15  IKP(KT,NI)= 53  IKC(KT,NI)= 556  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 53      TIME PERIOD  6   SECTION  5   NO. OF STUDENTS 18        ID OF STUDENTS
                                                              2040  2044  2069  2089
                                                              2109  2128  2131  2162
                                                              2167  2194  2214  2223
                                                              2257  2274  2282  2298
                                                              2311  2354
```

```
J= 54     SCHEDULING COURSE   535    NO CONFLICTS GENERATED

J= 54     COURSE=   535   NO. OF STUDENTS = 15    NO. OF SECTIONS = 5    SCHEDULED AT TIME PERIODS  1  2  3  4  5
J= 54     KT= 1  N(KT)= 19  IKP(KT,NI)= 54  IKC(KT,NI)= 535  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 54     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS  1        ID OF STUDENTS
                                                                 1011

J= 54     KT= 2  N(KT)= 18  IKP(KT,NI)= 54  IKC(KT,NI)= 535  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 54     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS  4        ID OF STUDENTS
                                                                 1002  1181  1193  1267

J= 54     KT= 3  N(KT)= 19  IKP(KT,NI)= 54  IKC(KT,NI)= 535  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 54     TIME PERIOD  3   SECTION  3   NO. OF STUDENTS  8        ID OF STUDENTS
                                                                 1026  1141  1150  1240
                                                                 1321  1338  2042  2314

J= 54     KT= 4  N(KT)= 25  IKP(KT,NI)= 54  IKC(KT,NI)= 535  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 54     TIME PERIOD  4   SECTION  4   NO. OF STUDENTS  1        ID OF STUDENTS
                                                                 2118

J= 54     KT= 5  N(KT)= 16  IKP(KT,NI)= 54  IKC(KT,NI)= 535  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 54     TIME PERIOD  5   SECTION  5   NO. OF STUDENTS  1        ID OF STUDENTS
                                                                 2149
```

```
J= 55  COURSE 525   CONFLICT  1  CONFLICTING STUDENT ID  2125  REQUEST LIST  24  309  525  558  571

J= 55      COURSE=    525    NO. OF STUDENTS =  4     NO. OF SECTIONS = 5     SCHEDULED AT TIME PERIODS  1  2  3  4  5
J= 55      KT= 1  N(KT)= 20  IKP(KT,NI)= 55  IKC(KT,NI)= 525  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 55      TIME PERIOD  1    SECTION  1    NO. OF STUDENTS  1          ID OF STUDENTS
                                                                      0

J= 55      KT= 2  N(KT)= 19  IKP(KT,NI)= 55  IKC(KT,NI)= 525  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 55      TIME PERIOD  2    SECTION  2    NO. OF STUDENTS  1          ID OF STUDENTS
                                                                   1020

J= 55      KT= 3  N(KT)= 20  IKP(KT,NI)= 55  IKC(KT,NI)= 525  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 55      TIME PERIOD  3    SECTION  3    NO. OF STUDENTS  1          ID OF STUDENTS
                                                                   2201

J= 55      KT= 4  N(KT)= 26  IKP(KT,NI)= 55  IKC(KT,NI)= 525  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 55      TIME PERIOD  4    SECTION  4    NO. OF STUDENTS  1          ID OF STUDENTS
                                                                      0

J= 55      KT= 5  N(KT)= 17  IKP(KT,NI)= 55  IKC(KT,NI)= 525  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 55      TIME PERIOD  5    SECTION  5    NO. OF STUDENTS  1          ID OF STUDENTS
                                                                   2143

                              TOTAL NUMBER OF CONFLICTS = 84
```

TIME PERIODS

	1	2	3	4	5	6
	********	********	********	********	********	********
LOCKED-IN COURSES						
	578	0	538	540	550	529
	579	0	12	541	0	559
	0	0	0	551	0	561
SEVERAL-HOUR COURSES						
	570	570	570	570	0	0
	571	571	571	0	0	0
	0	0	0	572	572	572
	573	573	573	0	0	0
RESTRICTED SINGLE-SECTION COURSES						
	0	0	0	19	21	0
	0	0	0	320	321	0
	577	0	0	0	0	575
SINGLE-SECTION COURSES						
	0	16	316	555	7	532
	0	547	306	0	0	0
MULTI-SECTION COURSES						
	0	0	0	534 -1	534 -2	534 -3
	0	0	0	581 -1	581 -2	581 -3
	0	0	0	568 -1	568 -2	568 -3
	530 -1	0	0	530 -2	0	0
	0	0	5 -1	0	0	5 -2
	0	562 -1	0	562 -2	0	0
	564 -1	0	0	0	564 -2	0
	0	0	546 -1	0	0	546 -2
	324 -1	0	0	324 -2	0	0
	24 -1	0	0	0	24 -2	0
	0	305 -1	0	0	305 -2	0
	0	0	8 -1	8 -2	0	0
	0	308 -1	0	308 -2	0	0
	0	0	323 -1	323 -2	0	0
	0	23 -1	0	23 -2	0	0
	309 -1	309 -2	309 -3	309 -4	0	0
	9 -1	9 -2	9 -3	9 -4	0	0
	553 -1	553 -2	553 -3	553 -4	0	0
	0	0	549 -1	0	0	549 -2
	548 -1	548 -2	0	0	548 -3	0
	560 -1	560 -2	0	0	0	0
	557 -1	557 -2	0	0	557 -3	557 -4
	0	531 -1	531 -2	531 -3	531 -4	0
	558 -1	0	558 -2	558 -3	558 -4	558 -5
	556 -1	556 -2	556 -3	556 -4	0	556 -5
	535 -1	535 -2	535 -3	535 -4	535 -5	0
	525 -1	525 -2	525 -3	525 -4	525 -5	0

```
J= 56      SCHEDULING COURSE    569       NO CONFLICTS GENERATED

 J= 56      COURSE=    569                      KI= 218     KTN(JS)=  1  2  3  4  5  6  6
 J= 56      KT= 1  N(KT)= 21  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
 J= 56      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 32         ID OF STUDENTS
                                                              2007  2019  2035  2038
                                                              2049  2057  2080  2087
                                                              2101  2109  2127  2134
                                                              2145  2162  2167  2180
                                                              2188  2202  2218  2226
                                                              2231  2247  2258  2266
                                                              2285  2298  2300  2320
                                                              2322  2331  2347  2359

 J= 56      KT= 2  N(KT)= 20  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
 J= 56      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 32         ID OF STUDENTS
                                                              1169  2009  2017  2039
                                                              2045  2060  2067  2089
                                                              2094  2116  2121  2128
                                                              2148  2163  2171  2175
                                                              2185  2204  2209  2220
                                                              2230  2249  2257  2271
                                                              2281  2288  2307  2316
                                                              2328  2335  2354  2361

 J= 56      KT= 3  N(KT)= 21  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  3
 J= 56      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 31         ID OF STUDENTS
                                                              2011  2012  2025  2040
                                                              2051  2065  2076  2097
                                                              2107  2118  2123  2137
                                                              2155  2161  2169  2183
                                                              2189  2210  2212  2227
                                                              2240  2250  2260  2273
                                                              2275  2294  2309  2323
                                                              2327  2352  2357

 J= 56      KT= 4  N(KT)= 27  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  4
 J= 56      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 31         ID OF STUDENTS
                                                              2006  2015  2037  2044
                                                              2055  2063  2082  2090
                                                              2105  2115  2126  2135
                                                              2149  2166  2172  2176
                                                              2194  2214  2217  2222
                                                              2241  2251  2261  2267
                                                              2282  2293  2306  2321
                                                              2329  2344  2351

 J= 56      KT= 5  N(KT)= 18  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  5
 J= 56      TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 31         ID OF STUDENTS
                                                              2001  2013  2026  2048
                                                              2058  2072  2085  2096
                                                              2108  2117  2132  2138
                                                              2154  2164  2173  2182
                                                              2196  2207  2215  2223
```

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                                                              2243  2253  2259  2272
                                                              2283  2299  2310  2318
                                                              2334  2346  2360

J= 56     KT= 6  N(KT)= 16  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  6
J= 56     TIME PERIOD  6   SECTION  6   NO. OF STUDENTS 31        ID OF STUDENTS
                                                              2002  2016  2033  2047
                                                              2062  2077  2083  2092
                                                              2110  2120  2133  2152
                                                              2158  2165  2178  2184
                                                              2201  2219  2229  2238
                                                              2246  2255  2265  2279
                                                              2290  2304  2313  2325
                                                              2330  2345  2363

J= 56     KT= 6  N(KT)= 17  IKP(KT,NI)= 56  IKC(KT,NI)= 569  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 56     TIME PERIOD  6   SECTION  7   NO. OF STUDENTS 30        ID OF STUDENTS
                                                              2003  2023  2041  2059
                                                              2074  2079  2086  2093
                                                              2111  2122  2139  2153
                                                              2159  2168  2179  2196
                                                              2205  2224  2235  2239
                                                              2252  2256  2268  2280
                                                              2291  2305  2317  2326
                                                              2340  2349


J= 57    SCHEDULING COURSE   537       NO CONFLICTS GENERATED

J= 57     COURSE=    537                      KI= 210     KTN(JS)=  1  2  3  4  5  6  6
J= 57     KT= 1  N(KT)= 22  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 57     TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 35        ID OF STUDENTS
                                                              2055  2056  2062  2065
                                                              2074  2082  2085  2086
                                                              2110  2115  2117  2132
                                                              2139  2158  2163  2165
                                                              2178  2182  2189  2207
                                                              2214  2238  2243  2259
                                                              2267  2268  2272  2299
                                                              2304  2310  2313  2328
                                                              2338  2346  2363

J= 57     KT= 2  N(KT)= 21  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 57     TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 34        ID OF STUDENTS
                                                              2001  2006  2015  2023
                                                              2041  2049  2057  2072
                                                              2079  2092  2105  2123
                                                              2135  2138  2152  2167
                                                              2176  2179  2194  2201
                                                              2212  2216  2229  2235
                                                              2246  2252  2261  2265
                                                              2280  2291  2317  2326
                                                              2340  2349

J= 57     KT= 3  N(KT)= 22  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  3
J= 57     TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 35        ID OF STUDENTS
                                                              2013  2017  2028  2037
                                                              2039  2047  2058  2077
```

```
                                                                      2109  2122  2126  2128
                                                                      2133  2145  2153  2168
                                                                      2195  2202  2204  2215
                                                                      2218  2219  2226  2230
                                                                      2247  2251  2256  2290
                                                                      2300  2305  2320  2325
                                                                      2354  2359  2361

J= 57     KT= 4  N(KT)= 28  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  4
J= 57     TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 33          ID OF STUDENTS
                                                                      2009  2011  2038  2040
                                                                      2045  2059  2067  2083
                                                                      2089  2093  2108  2120
                                                                      2134  2148  2162  2171
                                                                      2175  2185  2205  2220
                                                                      2223  2224  2227  2239
                                                                      2249  2255  2257  2275
                                                                      2288  2294  2316  2331
                                                                      2345

J= 57     KT= 5  N(KT)= 19  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  5
J= 57     TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 34          ID OF STUDENTS
                                                                      2002  2007  2016  2033
                                                                      2044  2051  2063  2076
                                                                      2101  2107  2111  2121
                                                                      2137  2159  2161  2172
                                                                      2183  2188  2196  2209
                                                                      2217  2222  2231  2240
                                                                      2250  2266  2273  2279
                                                                      2282  2298  2322  2335
                                                                      2347  2351

J= 57     KT= 6  N(KT)= 18  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  6
J= 57     TIME PERIOD  6   SECTION  6   NO. OF STUDENTS 20          ID OF STUDENTS
                                                                      2019  2035  2080  2090
                                                                      2096  2118  2165  2166
                                                                      2173  2210  2253  2260
                                                                      2281  2285  2306  2309
                                                                      2321  2327  2344  2360

J= 57     KT= 6  N(KT)= 19  IKP(KT,NI)= 57  IKC(KT,NI)= 537  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 57     TIME PERIOD  6   SECTION  7   NO. OF STUDENTS 19          ID OF STUDENTS
                                                                      2025  2048  2087  2094
                                                                      2116  2154  2164  2169
                                                                      2180  2241  2258  2271
                                                                      2283  2293  2307  2318
                                                                      2323  2334  2357

J= 58  COURSE 565   CONFLICT  1  CONFLICTING STUDENT ID  2037  REQUEST LIST  21  309  532  537  556  565  569
J= 58  COURSE 565   CONFLICT  2  CONFLICTING STUDENT ID  2039  REQUEST LIST   9  305  537  556  565  569  575
J= 58  COURSE 565   CONFLICT  3  CONFLICTING STUDENT ID  2040  REQUEST LIST  24  309  537  556  565  569  577
J= 58  COURSE 565   CONFLICT  4  CONFLICTING STUDENT ID  2045  REQUEST LIST   9  305  537  558  559  565  569
J= 58  COURSE 565   CONFLICT  5  CONFLICTING STUDENT ID  2067  REQUEST LIST   9  305  537  558  559  565  569
J= 58  COURSE 565   CONFLICT  6  CONFLICTING STUDENT ID  2105  REQUEST LIST  21  309  537  556  565  569  575
J= 58  COURSE 565   CONFLICT  7  CONFLICTING STUDENT ID  2120  REQUEST LIST   7  309  537  548  556  565  569
J= 58  COURSE 565   CONFLICT  8  CONFLICTING STUDENT ID  2127  REQUEST LIST   7  309  533  556  560  565  569
J= 58  COURSE 565   CONFLICT  9  CONFLICTING STUDENT ID  2137  REQUEST LIST   5  323  531  537  556  565  569
J= 58  COURSE 565   CONFLICT 10  CONFLICTING STUDENT ID  2161  REQUEST LIST   5    8  309  323  537  556  565  569
J= 58  COURSE 565   CONFLICT 11  CONFLICTING STUDENT ID  2169  REQUEST LIST  21  308  537  551  556  565  569
J= 58  COURSE 565   CONFLICT 12  CONFLICTING STUDENT ID  2185  REQUEST LIST   7  323  537  557  559  565  569
J= 58  COURSE 565   CONFLICT 13  CONFLICTING STUDENT ID  2209  REQUEST LIST   5  309  531  537  556  565  569
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J= 58  COURSE 565   CONFLICT 14  CONFLICTING STUDENT ID  2219  REQUEST LIST  24  309  537  556  560  565  569
J= 58  COURSE 565   CONFLICT 15  CONFLICTING STUDENT ID  2239  REQUEST LIST  21  309  537  558  564  565  569
J= 58  COURSE 565   CONFLICT 16  CONFLICTING STUDENT ID  2256  REQUEST LIST   7  309  537  551  556  565  569
J= 58  COURSE 565   CONFLICT 17  CONFLICTING STUDENT ID  2261  REQUEST LIST  24  309  537  556  559  565  569
J= 58  COURSE 565   CONFLICT 18  CONFLICTING STUDENT ID  2327  REQUEST LIST   7  309  537  551  556  565  569
J= 58  COURSE 565   CONFLICT 19  CONFLICTING STUDENT ID  2351  REQUEST LIST   5  309  531  537  558  565  569

J= 58      COURSE=   565                    KI= 202    KTN(JS)=  1  2  3  4  5  5  2
J= 58      KT= 1  N(KT)= 23  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 58      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 16        ID OF STUDENTS
                                                                 2096  2171  2172  2194
                                                                 2210  2253  2273  2306
                                                                 2309  2321  2335  2340
                                                                 2349  2352  2354  2361

J= 58      KT= 2  N(KT)= 22  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 58      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 29        ID OF STUDENTS
                                                                 2002  2013  2028  2044
                                                                 2055  2059  2066  2085
                                                                 2108  2111  2132  2164
                                                                 2173  2182  2189  2196
                                                                 2217  2223  2243  2255
                                                                 2266  2282  2298  2310
                                                                 2320  2331  2334  2347
                                                                 2360

J= 58      KT= 3  N(KT)= 23  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 58      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 27        ID OF STUDENTS
                                                                 2019  2041  2049  2072
                                                                 2074  2083  2086  2134
                                                                 2138  2139  2158  2167
                                                                 2180  2184  2205  2208
                                                                 2229  2231  2235  2257
                                                                 2265  2271  2283  2299
                                                                 2313  2329  2338

J= 58      KT= 4  N(KT)= 29  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 58      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 28        ID OF STUDENTS
                                                                 2012  2017  2047  2048
                                                                 2077  2080  2094  2101
                                                                 2116  2117  2122  2128
                                                                 2153  2159  2179  2183
                                                                 2204  2226  2230  2252
                                                                 2272  2280  2285  2290
                                                                 2305  2317  2326  2346

J= 58      KT= 5  N(KT)= 20  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 58      TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 28        ID OF STUDENTS
                                                                 2003  2009  2023  2038
                                                                 2079  2087  2090  2109
                                                                 2123  2135  2148  2163
                                                                 2168  2176  2202  2220
                                                                 2227  2241  2247  2251
                                                                 2267  2275  2288  2293
                                                                 2307  2323  2328  2357

J= 58      KT= 5  N(KT)= 21  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=   IKF(KT,NI)=SECTION  6
J= 58      TIME PERIOD  5   SECTION  6   NO. OF STUDENTS 27        ID OF STUDENTS
                                                                 2006  2015  2035  2065
                                                                 2082  2089  2097  2115
                                                                 2133  2145  2162  2165
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                                                                       2175  2201  2212  2224
                                                                       2238  2246  2249  2260
                                                                       2268  2281  2291  2304
                                                                       2316  2325  2344

J= 58      KT= 2  N(KT)= 23  IKP(KT,NI)= 58  IKC(KT,NI)= 565  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 58      TIME PERIOD  2   SECTION  7   NO. OF STUDENTS 28          ID OF STUDENTS
                                                                       2007  2025  2033  2051
                                                                       2058  2063  2076  2107
                                                                       2110  2126  2155  2166
                                                                       2178  2188  2195  2207
                                                                       2218  2240  2250  2259
                                                                       2279  2294  2300  2318
                                                                       2322  2333  2345  2359

J= 59  COURSE 567   CONFLICT  1  CONFLICTING STUDENT ID  2093  REQUEST LIST  23   24  309  316  537. 556  567  569

J= 59      COURSE=    567                       KI= 193     KTN(JS)=  1  2  3  4  5  6  6
J= 59      KT= 1  N(KT)= 24  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 59      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 29          ID OF STUDENTS
                                                                       1001  1022  1037  1052
                                                                       1055  1071  1081  1100
                                                                       1104  1115  1133  1146
                                                                       1163  1180  1199  1208
                                                                       1223  1235  1238  1262
                                                                       1275  1282  1295  1300
                                                                       1324  1339  1342  2018
                                                                       2324

J= 59      KT= 2  N(KT)= 24  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 59      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 28          ID OF STUDENTS
                                                                       1009  1031  1039  1053
                                                                       1067  1074  1090  1098
                                                                       1107  1124  1135  1147
                                                                       1170  1184  1201  1209
                                                                       1228  1236  1243  1268
                                                                       1280  1288  1297  1302
                                                                       1330  1337  1347  2073

J= 59      KT= 3  N(KT)= 24  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  3
J= 59      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 28          ID OF STUDENTS
                                                                       1010  1020  1042  1045
                                                                       1068  1079  1084  1102
                                                                       1105  1120  1142  1149
                                                                       1177  1192  1202  1214
                                                                       1229  1237  1240  1271
                                                                       1279  1285  1294  1303
                                                                       1327  1345  2021  2242

J= 59      KT= 4  N(KT)= 30  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  4
J= 59      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 28          ID OF STUDENTS
                                                                       1012  1036  1040  1066
                                                                       1070  1080  1095  1101
                                                                       1119  1127  1137  1155
                                                                       1175  1194  1203  1220
                                                                       1233  1242  1261  1272
                                                                       1281  1287  1299  1310
                                                                       1332  1342  2062  2180

J= 59      KT= 5  N(KT)= [illegible]  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  5
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[illegible]
J= 59      TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 27         ID OF STUDENTS
                                                               1016  1028  1051  1065
                                                               1078  1083  1092  1103
                                                               1114  1128  1140  1156
                                                               1187  1188  1204  1218
                                                               1234  1247  1260  1269
                                                               1284  1289  1307  1323
                                                               1335  1341  2060

J= 59      KT= 6  N(KT)= 20  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  6
J= 59      TIME PERIOD  6   SECTION  6   NO. OF STUDENTS 26         ID OF STUDENTS
                                                               1017  1030  1047  1069
                                                               1075  1085  1095  1112
                                                               1126  1130  1157  1162
                                                               1179  1198  1205  1224
                                                               1230  1251  1259  1273
                                                               1277  1291  1309  1318
                                                               1344  1351

J= 59      KT= 6  N(KT)= 21  IKP(KT,NI)= 59  IKC(KT,NI)= 567  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 59      TIME PERIOD  6   SECTION  7   NO. OF STUDENTS 26         ID OF STUDENTS
                                                               1018  1038  1054  1073
                                                               1082  1087  1097  1113
                                                               1129  1132  1159  1166
                                                               1183  1200  1207  1225
                                                               1232  1252  1264  1276
                                                               1283  1292  1317  1329
                                                               1349  1353


J= 60      SCHEDULING COURSE   580       NO CONFLICTS GENERATED

J= 60      COURSE=   580                        KI= 191     KTN(JS)=  1  2  3  4  5  6  6  5
J= 60      KT= 1  N(KT)= 25  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 60      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 28         ID OF STUDENTS
                                                               1016  1030  1047  1053
                                                               1065  1074  1087  1090
                                                               1096  1101  1127  1132
                                                               1184  1188  1194  1202
                                                               1207  1220  1224  1237
                                                               1277  1292  1302  1303
                                                               1335  1344  1345  2073

J= 60      KT= 2  N(KT)= 25  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 60      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 28         ID OF STUDENTS
                                                               1001  1022  1036  1052
                                                               1069  1075  1081  1085
                                                               1095  1112  1126  1149
                                                               1163  1166  1179  1198
                                                               1204  1218  1232  1238
                                                               1260  1282  1289  1318
                                                               1341  1348  1353  2050

J= 60      KT= 3  N(KT)= 25  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  3
J= 60      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 27         ID OF STUDENTS
                                                               1009  1028  1051  1055
                                                               1070  1078  1083  1092
                                                               1100  1124  1128  1155
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                                                                            1156  1170  1180  1203
                                                                            1205  1230  1235  1259
                                                                            1273  1283  1300  1307
                                                                            1330  1337  1351

J= 60     KT= 4  N(KT)= 31  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  4
J= 60     TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 27          ID OF STUDENTS
                                                                            1010  1038  1039  1045
                                                                            1071  1084  1097  1107
                                                                            1113  1120  1135  1162
                                                                            1177  1183  1208  1209
                                                                            1243  1248  1252  1264
                                                                            1275  1278  1324  1329
                                                                            1342  1347  2360

J= 60     KT= 5  N(KT)= 23  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  5
J= 50     TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 25          ID OF STUDENTS
                                                                            1017  1037  1066  1068
                                                                            1079  1082  1104  1115
                                                                            1130  1147  1159  1200
                                                                            1214  1225  1233  1261
                                                                            1268  1279  1281  1288
                                                                            1294  1309  1317  1339
                                                                            1349

J= 60     KT= 6  N(KT)= 22  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  6
J= 60     TIME PERIOD  6   SECTION  6   NO. OF STUDENTS 16          ID OF STUDENTS
                                                                            1012  1031  1042  1103
                                                                            1119  1137  1142  1175
                                                                            1192  1234  1242  1269
                                                                            1272  1287  1297  1323

J= 60     KT= 6  N(KT)= 23  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 60     TIME PERIOD  6   SECTION  7   NO. OF STUDENTS 16          ID OF STUDENTS
                                                                            1020  1040  1102  1114
                                                                            1133  1140  1169  1187
                                                                            1228  1236  1247  1271
                                                                            1284  1295  1316  1332

J= 60     KT= 5  N(KT)= 24  IKP(KT,NI)= 60  IKC(KT,NI)= 580  IKG(KT,NI)=    IKF(KT,NI)=SECTION  8
J= 60     TIME PERIOD  5   SECTION  8   NO. OF STUDENTS 24          ID OF STUDENTS
                                                                            1018  1054  1067  1073
                                                                            1080  1098  1105  1129
                                                                            1146  1157  1199  1201
                                                                            1223  1229  1251  1262
                                                                            1276  1280  1285  1291
                                                                            1299  1310  1327  1342

J= 61  COURSE 533   CONFLICT  1  CONFLICTING STUDENT ID  1009  REQUEST LIST 531  533  550  553  567  580
J= 61  COURSE 533   CONFLICT  2  CONFLICTING STUDENT ID  1028  REQUEST LIST 533  548  553  560  567  580
J= 61  COURSE 533   CONFLICT  3  CONFLICTING STUDENT ID  1039  REQUEST LIST   5  321  533  558  564  567  580
J= 61  COURSE 533   CONFLICT  4  CONFLICTING STUDENT ID  1045  REQUEST LIST  24  305  533  546  557  567  580
J= 61  COURSE 533   CONFLICT  5  CONFLICTING STUDENT ID  1066  REQUEST LIST 531  533  553  567  577  580
J= 61  COURSE 533   CONFLICT  6  CONFLICTING STUDENT ID  1090  REQUEST LIST   5   21  321  323  533  553  567  580
J= 61  COURSE 533   CONFLICT  7  CONFLICTING STUDENT ID  1156  REQUEST LIST   5  324  530  533  553  567  580
J= 61  COURSE 533   CONFLICT  8  CONFLICTING STUDENT ID  1166  REQUEST LIST  24  308  531  533  553  567  580
J= 61  COURSE 533   CONFLICT  9  CONFLICTING STUDENT ID  1224  REQUEST LIST   8  305  531  533  553  567  580
J= 61  COURSE 533   CONFLICT 10  CONFLICTING STUDENT ID  1277  REQUEST LIST   8  305  531  533  553  567  580
J= 61  COURSE 533   CONFLICT 11  CONFLICTING STUDENT ID  1282  REQUEST LIST   5  324  533  557  561  567  580
J= 61  COURSE 533   CONFLICT 12  CONFLICTING STUDENT ID  1288  REQUEST LIST   5  324  533  546  553  567  580
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J= 61  CCURSE 533   CONFLICT 13  CONFLICTING STUDENT ID  1330  REQUEST LIST   5  324  533  557  560  567  580
J= 61  CCURSE 533   CONFLICT 14  CONFLICTING STUDENT ID  1342  REQUEST LIST   5  308  531  533  553  567  580
J= 61  CCURSE 533   CONFLICT 15  CONFLICTING STUDENT ID  1345  REQUEST LIST   5  308  531  533  553  567  580
J= 61  CCURSE 533   CONFLICT 16  CONFLICTING STUDENT ID  2127  REQUEST LIST   7  309  533  556  560  565  569

J= 61      COURSE=    533                      KI= 180     KTN(JS)=  1  2  3  4  5  5  2
J= 61      KT= 1  N(KT)= 26  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  1
J= 61      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 31        ID OF STUDENTS
                                                               1031  1051  1067  1068
                                                               1070  1073  1080  1082
                                                               1112  1114  1120  1124
                                                               1129  1135  1137  1140
                                                               1147  1149  1155  1209
                                                               1230  1232  1247  1252
                                                               1269  1299  1307  1341
                                                               1347  1349  1353

J= 61      KT= 2  N(KT)= 26  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  2
J= 61      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 28        ID OF STUDENTS
                                                               1012  1018  1042  1055
                                                               1071  1083  1096  1101
                                                               1113  1146  1162  1177
                                                               1183  1194  1202  1205
                                                               1220  1233  1237  1259
                                                               1271  1273  1281  1291
                                                               1309  1317  1339  2003

J= 61      KT= 3  N(KT)= 26  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  3
J= 61      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 30        ID OF STUDENTS
                                                               1022  1030  1036  1052
                                                               1069  1074  1081  1085
                                                               1086  1087  1095  1097
                                                               1104  1126  1127  1132
                                                               1159  1179  1187  1198
                                                               1204  1207  1234  1238
                                                               1243  1260  1261  1276
                                                               1318  1323

J= 61      KT= 4  N(KT)= 32  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  4
J= 61      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 32        ID OF STUDENTS
                                                               1091  1016  1047  1053
                                                               1075  1079  1098  1105
                                                               1128  1130  1163  1184
                                                               1199  1201  1214  1223
                                                               1228  1229  1251  1262
                                                               1268  1279  1280  1284
                                                               1285  1289  1292  1294
                                                               1300  1302  1327  1351

J= 61      KT= 5  N(KT)= 25  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 61      TIME PERIOD  5   SECTION  5   NO. OF STUDENTS 12        ID OF STUDENTS
                                                               1010  1038  1084  1107
                                                               1133  1169  1236  1287
                                                               1297  1324  1332  2184

J= 61      KT= 5  N(KT)= 26  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=   IKF(KT,NI)=SECTION  6
J= 61      TIME PERIOD  5   SECTION  6   NO. OF STUDENTS 11        ID OF STUDENTS
                                                               1020  1040  1102  1119
                                                               1142  1192  1242  1295
                                                               1316  1329  1342
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J= 61      KT= 2  N(KT)= 27  IKP(KT,NI)= 61  IKC(KT,NI)= 533  IKG(KT,NI)=    IKF(KT,NI)=SECTION  7
J= 61      TIME PERIOD  2   SECTION  7   NO. OF STUDENTS 28         ID OF STUDENTS
                                                              1017  1037  1054  1065
                                                              1078  1092  1100  1103
                                                              1115  1157  1175  1180
                                                              1188  1200  1203  1208
                                                              1225  1235  1248  1264
                                                              1272  1275  1283  1303
                                                              1310  1335  1344  2352


J= 62  COURSE 552   CONFLICT  1  CONFLICTING STUDENT ID  1040  REQUEST LIST  24  308  531  533  552  567  580
J= 62  COURSE 552   CONFLICT  2  CONFLICTING STUDENT ID  1075  REQUEST LIST   8  324  531  533  552  567  580
J= 62  COURSE 552   CONFLICT  3  CONFLICTING STUDENT ID  1100  REQUEST LIST   5  308  531  533  552  567  580
J= 62  COURSE 552   CONFLICT  4  CONFLICTING STUDENT ID  1107  REQUEST LIST   5  323  533  552  560  567  580
J= 62  COURSE 552   CONFLICT  5  CONFLICTING STUDENT ID  1112  REQUEST LIST  21  324  533  546  552  567  580
J= 62  COURSE 552   CONFLICT  6  CONFLICTING STUDENT ID  1169  REQUEST LIST   8  324  533  538  552  569  580
J= 62  COURSE 552   CONFLICT  7  CONFLICTING STUDENT ID  1197  REQUEST LIST   5  308  531  552  571
J= 62  COURSE 552   CONFLICT  8  CONFLICTING STUDENT ID  1244  REQUEST LIST   7  323  552  559  573
J= 62  COURSE 552   CONFLICT  9  CONFLICTING STUDENT ID  1279  REQUEST LIST   5  324  531  533  552  567  580
J= 62  COURSE 552   CONFLICT 10  CONFLICTING STUDENT ID  1286  REQUEST LIST   5  324  550  552  573
J= 62  COURSE 552   CONFLICT 11  CONFLICTING STUDENT ID  1318  REQUEST LIST  19  321  533  552  567  577  580
J= 62  COURSE 552   CONFLICT 12  CONFLICTING STUDENT ID  2226  REQUEST LIST   7  309  537  552  559  565  569

J= 62      COURSE=    552                        K1= 172     KTN(JS)=  1  2  3  4  5  6
J= 62      KT= 1  N(KT)= 27  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=    IKF(KT,NI)=SECTION  1
J= 62      TIME PERIOD  1   SECTION  1   NO. OF STUDENTS 15         ID OF STUDENTS
                                                              1006  1079  1084  1102
                                                              1139  1157  1175  1201
                                                              1228  1229  1236  1291
                                                              1297  1309  1310


J= 62      KT= 2  N(KT)= 28  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=    IKF(KT,NI)=SECTION  2
J= 62      TIME PERIOD  2   SECTION  2   NO. OF STUDENTS 26         ID OF STUDENTS
                                                              1070  1093  1119  1133
                                                              1142  1161  1192  1199
                                                              1295  1324  2019  2035
                                                              2062  2065  2096  2097
                                                              2117  2145  2180  2202
                                                              2215  2231  2247  2258
                                                              2268  2338


J= 62      KT= 3  N(KT)= 27  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=    IKF(KT,NI)=SECTION  3
J= 62      TIME PERIOD  3   SECTION  3   NO. OF STUDENTS 35         ID OF STUDENTS
                                                              1012  1031  1037  1053
                                                              1065  1071  1113  1114
                                                              1146  1162  1163  1194
                                                              1200  1209  1220  1223
                                                              1225  1242  1247  1251
                                                              1264  1272  1292  1299
                                                              1329  1344  1349  1353
                                                              2082  2172  2241  2243
                                                              2249  2266  2335


J= 62      KT= 4  N(KT)= 33  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=    IKF(KT,NI)=SECTION  4
J= 62      TIME PERIOD  4   SECTION  4   NO. OF STUDENTS 35         ID OF STUDENTS
                                                              1017  1022  1025  1042
                                                              1051  1052  1060  1067
                                                              1078  1109  1176  1189
                                                              1258  1314  1315  1335
                                                              2074  2086  2123  2132
                                                              2170  2186  2188  2189
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                                                                2235  2238  2240  2265
                                                                2281  2299  2307  2310
                                                                2313  2322  2347

J= 62     KT= 5  N(KT)= 27  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=   IKF(KT,NI)=SECTION  5
J= 62     TIME PERIOD  5    SECTION  5    NO. OF STUDENTS 29        ID OF STUDENTS
                                                                1001  1023  1029  1030
                                                                1044  1099  1106  1123
                                                                1143  1154  1168  1178
                                                                1190  1222  1298  1308
                                                                2017  2049  2077  2116
                                                                2134  2158  2171  2205
                                                                2265  2300  2305  2320
                                                                2340

J= 62     KT= 6  N(KT)= 24  IKP(KT,NI)= 62  IKC(KT,NI)= 552  IKG(KT,NI)=   IKF(KT,NI)=SECTION  6
J= 62     TIME PERIOD  6    SECTION  6    NO. OF STUDENTS 20        ID OF STUDENTS
                                                                1004  1013  1034  1043
                                                                1054  1076  1122  1151
                                                                1153  1165  1185  1206
                                                                1239  1253  1256  1304
                                                                2013  2157  2329  2358


                              TOTAL NUMBER OF CONFLICTS = 48
```

	TIME PERIODS					
	1	2	3	4	5	6
	********	********	********	********	********	********
LOCKED-IN COURSES						
	578	0	538	540	550	529
	579	0	12	541	0	559
	0	0	0	551	0	561
SEVERAL-HOUR COURSES						
	570	570	570	570	0	0
	571	571	571	0	0	0
	0	0	0	572	572	572
	573	573	573	0	0	0
RESTRICTED SINGLE-SECTION COURSES						
	0	0	0	19	21	0
	0	0	0	320	321	0
	577	0	0	0	0	575
SINGLE-SECTION COURSES						
	0	16	316	555	7	532
	0	547	306	0	0	0
MULTI-SECTION COURSES						
	0	0	0	534 -1	534 -2	534 -3
	0	0	0	581 -1	581 -2	581 -3
	0	0	0	568 -1	568 -2	568 -3
	530 -1	0	0	530 -2	0	0
	0	0	5 -1	0	0	5 -2
	0	562 -1	0	562 -2	0	0
	564 -1	0	0	0	564 -2	0
	0	0	546 -1	0	0	546 -2
	324 -1	0	0	324 -2	0	0
	24 -1	0	0	0	24 -2	0
	0	305 -1	0	0	305 -2	0
	0	0	8 -1	8 -2	0	0
	0	308 -1	0	308 -2	0	0
	0	0	323 -1	323 -2	0	0
	0	23 -1	0	23 -2	0	0
	309 -1	309 -2	309 -3	309 -4	0	0
	9 -1	9 -2	9 -3	9 -4	0	0
	553 -1	553 -2	553 -3	553 -4	0	0
	0	0	549 -1	0	0	549 -2
	548 -1	548 -2	0	0	548 -3	0
	560 -1	560 -2	0	0	0	0
	557 -1	557 -2	0	0	557 -3	557 -4
	0	531 -1	531 -2	531 -3	531 -4	0
	558 -1	0	558 -2	558 -3	558 -4	558 -5
	556 -1	556 -2	556 -3	556 -4	0	556 -5
	535 -1	535 -2	535 -3	535 -4	535 -5	0
	525 -1	525 -2	525 -3	525 -4	525 -5	0
	569 -1	569 -2	569 -3	569 -4	569 -5	569 -6
	0	0	0	0	0	569 -7
	537 -1	537 -2	537 -3	537 -4	537 -5	537 -6
	0	0	0	0	0	537 -7
	565 -1	565 -2	565 -3	565 -4	565 -5	0
	0	0	0	0	565 -6	0
	0	565 -7	0	0	0	0
	567 -1	567 -2	567 -3	567 -4	567 -5	567 -6
	0	0	0	0	0	567 -7
	580 -1	580 -2	580 -3	580 -4	580 -5	580 -6
	0	0	0	0	0	580 -7
	0	0	0	0	580 -8	0
	533 -1	533 -2	533 -3	533 -4	533 -5	0
	0	0	0	0	533 -6	0
	0	533 -7	0	0	0	0
	552 -1	552 -2	552 -3	552 -4	552 -5	552 -6