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<td>July 1996</td>
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**Software Version**

SCHEDULE25 version 2.4

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Preface

Introduction

If you are a SCHEDULE25 user, this manual is for you. It contains all the information you need to understand and successfully use SCHEDULE25 in your classroom scheduling process.

This manual has two sections:

- **Understanding SCHEDULE25**
  This section provides reference information you need to know before beginning to use SCHEDULE25. The chapters in this section are designed to thoroughly acquaint you with how SCHEDULE25 processes information, so you have the product knowledge necessary to most effectively use SCHEDULE25.

- **Using SCHEDULE25**
  This section provides procedural information. The chapters in this section are designed to teach you how to use SCHEDULE25.

In addition, the manual contains an appendix.

This manual assumes that SCHEDULE25 has already been installed and set up at your institution and that all of the SCHEDULE25 input files are ready for your use in the scheduling process. If this is not the case or you would like further information about these topics, see:

- The Installation and Setup manual for SCHEDULE25 for installation and setup instructions.
- The Data Preparation manual for SCHEDULE25 for information on input file and interface program preparation.
What’s in this manual

The table below summarizes the content of each chapter in this manual.

<table>
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| 1 - Welcome to SCHEDULE25 | • The SCHEDULE25 advantage  
• Functionality and processing at a summary level  
• A typical scheduling process  
• SCHEDULE25’s relationship to 25E and MODEL25 |
| 2 - How SCHEDULE25 Uses the Campus Profile file | • What each of the Campus Profile files is  
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| A - File Maintenance for Schedulers | • Basic operating system file commands used by schedulers  
• The kinds of file editing tools available |
## Notation conventions

This manual uses the following notation conventions:

<table>
<thead>
<tr>
<th>Notation</th>
<th>Meaning</th>
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<tbody>
<tr>
<td>bracket <code>&lt; &gt;</code></td>
<td>Pointed brackets indicate a key (or keys) on the keyboard. For example, “Press <code>&lt;Ctrl-e&gt;</code>” means that you hold down the key labeled “Ctrl” and the letter “e” key at the same time.</td>
</tr>
<tr>
<td>words in <strong>bold</strong> type</td>
<td>If a step in an instruction includes a word or phrase in bold type, it indicates that you must enter exactly what is in bold type. For example, “Type <code>s25</code>” means that you type <code>s25</code>.</td>
</tr>
<tr>
<td>words in <em>italicized helvetica font</em></td>
<td>File names in tables and text appear in <em>italicized helvetica font</em>.</td>
</tr>
<tr>
<td>exclamation point symbol</td>
<td>The exclamation point symbol next to text indicates that the text is a warning that should be read and followed carefully.</td>
</tr>
</tbody>
</table>
If you need additional support

How to reach us by phone or fax

Your SCHEDULE25 product license authorizes you to receive telephone support from Universal Algorithms. We’re available to answer the phone from 8:00 a.m. to 5:00 p.m. Pacific Standard (or Daylight) Time. If you call outside those hours, you may leave a message on our voice mail system, and we will return your call as soon as possible.

If you are located in a country whose business hours don’t overlap those of Universal Algorithms, we can be available for support calls outside our regular hours by prearrangement.

The Universal Algorithms telephone numbers are:

- Customer Support - (503) 973-5250
- Main office line - (503) 973-5200
- Fax - (503) 973-5252

How to reach us by e-mail

You may also reach Universal Algorithms customer support by electronic mail at: support@unival.com
If you have comments or want to purchase additional copies of this manual

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At the back of this manual is a Reader Comment Card. Please fill it out and let us know if you—

- Discover an error in the documentation
- Find a concept or instruction that is confusing
- Have a suggestion for an enhancement to the documentation
- Have a kind word to say!

The card is already addressed to Universal Algorithms; just fill it out, stamp it, and drop it in the mail!
You can purchase additional copies of this manual by contacting:

Universal Algorithm, Inc.
One SW Columbia, Suite 100
Portland, OR 97258
Phone: (503) 973-5200
Fax: (503) 973-5252
Understanding SCHEDULE25
Welcome to SCHEDULE25

Introduction

What's in this chapter

Welcome to SCHEDULE25—the powerful space scheduling system that generates classroom assignments with maximum speed and efficiency.

As a SCHEDULE25 user, you’ll be able to appreciate first hand why SCHEDULE25 is the best classroom scheduling software available.

SCHEDULE25 has one and only one purpose—to place classes in rooms in the absolutely best way possible based on your requirements.

SCHEDULE25 doesn’t decide which classes should be held or who should teach.

SCHEDULE25 doesn’t change any of your class data to make its classroom assignments.

SCHEDULE25 allows you to preassign classes when you need to—for any reason.

This chapter is designed to briefly acquaint you with SCHEDULE25—what it does and how it does it. It includes:

- The advantages of SCHEDULE25
- SCHEDULE25 functionality
- How SCHEDULE25 works—input, processing, output
- A typical scheduling process using SCHEDULE25
- SCHEDULE25’s relationship to its companion products, 25E and MODEL25
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</tbody>
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The SCHEDULE25 advantage

SCHEDULE25 provides several important advantages over any other bulk or batch scheduling system.

**Speed**

Because SCHEDULE25 is so fast—all classroom assignments for a semester or year can typically be generated in under five minutes—new, powerful options are open to you.

You can, for example, postpone the assignment of classrooms until the most accurate class demand data has been collected. No longer are you forced to begin assigning classrooms well in advance of class timetable publication. Even if you elect to continue generating an initial classroom schedule in advance, SCHEDULE25 gives you much more speed and flexibility in responding to the need for new classroom assignments as the enrollment of classes fluctuates and classes are added and dropped. At such times, you can schedule periodic reruns of SCHEDULE25 to quickly obtain revised classroom assignments. On any rerun of SCHEDULE25 you have the option of completely redoing all assignments or of retaining any subset of the previous run.

Because SCHEDULE25 is written as a “native” application in the powerful C language, it operates much faster than if it had been written in a higher level language layered on top of a database product. This direct, close-to-the-machine design is aimed specifically at optimizing the classroom assignment algorithm.

**Flexibility**

Besides the speed with which you can make classroom assignments, SCHEDULE25 also gives you extraordinary flexibility in responding to the needs of faculty and students. With SCHEDULE25, you can define up to 96 special room characteristics, any combination of which can be specified for any classroom request. *You* define the room features—you don’t have to choose from a limited group of possibilities provided by the vendor. So, if a professor must have a room with at least 40 sq. ft. of blackboard space, west windows, and a podium, you can easily mark that combination and submit the request to SCHEDULE25. If there is a room with these characteristics, SCHEDULE25 will know about it and will assign it to the professor if the room is available.

SCHEDULE25’s sensitivity to the needs of faculty and students is not limited to physical room characteristics. For example, the system also works to satisfy department location preferences. Using SCHEDULE25, you can define and rank regions of the campus as acceptable placements for each department. For example, such regions might be defined for the Math department so that the system tends to place most Math classes on the second floor of the Math building.
Welcome to SCHEDULE25

Reliability

SCHEDULE25 was programmed with attention to detail and rigorous methodology. SCHEDULE25 provides a secure, solid, tested environment for assigning valuable campus space resources. As a user, you benefit from the successful use of SCHEDULE25 by professionals at other leading colleges and universities.

Accuracy

SCHEDULE25 ensures information integrity at every step. As part of each SCHEDULE25 run, all input files are checked for correct syntax and feasibility. SCHEDULE25 generates diagnostic messages if it encounters missing or incorrectly formatted data and alerts you to impossible and illogical requests. For example, if a class has an enrollment of 500, but the largest lecture hall on campus seats 479, SCHEDULE25 rejects that class as impossible to place.

Calendar flexibility

SCHEDULE25 can process room assignment requests for any date span—a term, a semester, a full calendar year. SCHEDULE25 will not assign two classes to the same room at the same time unless you specifically request it to, as in the case of cross-listed classes.

Compatibility with MODEL25

MODEL25 is Universal Algorithms’ point-and-click graphical space modeling tool. MODEL25 uses the information you set up for SCHEDULE25 and allows you to model “what if” scenarios quickly, resulting in full-color graphs that interpret your classroom demand, timespread, and optimal space configuration. MODEL25 requires no additional campus information, and the results of modeling experiments do not affect the input, output, or operation of SCHEDULE25.

Using MODEL25, you can explore how closure of a building would affect classroom assignments. Given such a closure, would it still be possible to place all classes? Would the resulting assignments be satisfactory? You can experiment for energy savings, investigate switching classrooms to offices, or see the impact on rooms assignments of switching from terms to semesters or vice versa.

Similarly, you could use MODEL25 to assist you in decision-making during the design of new classroom space. Your MODEL25 graphs might call into question the need for new construction or they might show how new classroom space would permit higher station utilization, better satisfaction of departmental location preferences, or greater capacity to accommodate growing class offerings.
 Compatibility with 25E

25E is Universal Algorithms’ on-line, multi-user event scheduling system. You can automatically load the results from any SCHEDULE25 run into 25E, eliminating the need to manually re-enter descriptive information about these assignments. Within 25E, users have a single, campus-wide database for reserving classrooms and other campus space, as well as reporting on space utilization.

25E accepts class information in the same format as SCHEDULE25, so no additional system interfaces are required. Also, using 25E’s Security/Setup system, you can prevent 25E on-line assignments from being made beyond a certain date barrier to ensure that open space is reserved for loading SCHEDULE25 academic assignments before booking special events.

 Reporting capability

Each SCHEDULE25 run produces seven reports detailing the placements SCHEDULE25 made, the placements it could not make, and any diagnostic messages (see report menu below). These reports allow you to analyze the outcome of the SCHEDULE25 run and make subsequent decisions about whether to accept the classroom assignments SCHEDULE25 generated or make modifications to input files and rerun SCHEDULE25.

 Security

Access to SCHEDULE25 is determined by directory and file permissions—no additional profiles or security systems are required. Generally, SCHEDULE25 is run by one person or one office, and no other individuals need to have access to the system.
SCHEDULE25 functionality

SCHEDULE25 lets you quickly and easily assign classrooms to any number of classes. From the SCHEDULE25 menu (shown below) you can:

- **Run SCHEDULE25**
  Once you have prepared the Campus Profile describing the rooms, departments, and other attributes of your campus, and once a list of classes with necessary time, day, and enrollment information has been extracted from your course file, running SCHEDULE25 is as simple as selecting a menu option.

- **Browse reports**
  Within minutes, if not seconds, of each SCHEDULE25 run, you can browse SCHEDULE25 reports on-line to review the number of classes placed and the room assignments made by SCHEDULE25. If SCHEDULE25 encounters errors, including any preassignment conflicts, you can review the accompanying messages on-line. Reports also include lists of classes that could not be placed by SCHEDULE25, either because the request was illogical or because there was too much competition for the same kind of rooms at the same days and times.

- **Print reports**
  If you are more comfortable working with hard copy reports or want to distribute them to departments, you can also print reports from the SCHEDULE25 menu.
How SCHEDULE25 works

Components of the scheduling process

SCHEDULE25 can be run in either on-line or batch mode, but it is fundamentally a bulk scheduler whose input data is prepared prior to execution. The diagram on the next page shows the components of the SCHEDULE25 process:

- Input data (Class Descriptor and Campus Profile files)
- SCHEDULE25 software
- Output data (Data and Report files)
- Extract/Update programs developed by your institution
Welcome to SCHEDULE25

SCHEDULE25 Processing Components

Course Master

> class/section extract program

> datain.dat

Class Descriptor File

> phys.dat
> part.dat
> depts.dat
> rooms.dat
> ctrl.dat

Campus Profile Files

room assignment update program

SCHEDULE25

> summary.dat
> errors.dat
> notposs.dat
> losers.dat
> sortdp.dat
> sortrm.dat
> sortrm.pl

Data Files

> summary.rpt
> diag.rpt
> notposs.rpt
> losers.rpt
> sortdp.rpt
> sortrm.rpt
> avail.rpt

Report Files

= extract/update programs developed by your institution
Input data

SCHEDULE25 requires two kinds of input files:

- A Class Descriptor file
- Campus Profile files

The Class Descriptor file (usually named datain.dat) lists all classes (sections) to be scheduled into rooms that are part of SCHEDULE25’s inventory.

The Campus Profile files describe your campus and processing requirements to SCHEDULE25. The five Campus Profile files (and their customary names) are:

- Physical Features file (phys.dat)
- Partitions file (part.dat)
- Departments file (depts.dat)
- Rooms file (rooms.dat)
- Control file (ctrl.dat)

For descriptions and samples of these files, see chapters 2, 3, and 4.

SCHEDULE25 software

SCHEDULE25 reads the input data files that describe your campus and your class offerings, builds a model of this configuration in memory, and then quickly decides where the classes should be assigned.

SCHEDULE25 has three objectives when assigning classes:

- To maximize the number of classes placed
- To maximize departmental satisfaction with placements
- To maximize space utilization

The SCHEDULE25 algorithm and classroom assignment process are described in chapter 5.
Output data

After executing the assignment algorithm, SCHEDULE25 generates two kinds of output files:

- Data files
- Report files

The seven output data files are ASCII text files that contain the results of SCHEDULE25’s processing. Some files contain class records with room assignments, some contain class records which did not get placed for one reason or another, and some contain class records which have record format errors.

Five of these data files have a corresponding report file, formatted for printing and readability. Two additional reports summarize the SCHEDULE25 run and room availability after the SCHEDULE25 run.

- Placement Analysis Report
  A summary of the performance of the SCHEDULE25 run.

- Diagnostics for erroneously prepared records
  Diagnostic messages for all SCHEDULE25 input files.

- Listing of classes that could not be placed
  A list of the room requests that SCHEDULE25 could not place because of scheduling conflicts.

- Listing of classes impossible to place
  A list of the room requests that SCHEDULE25 found impossible to place because of the conditions of the request.

- Listing of classes placed (by dept)
  A list of all preassigned classes and SCHEDULE25 assignments sorted by department.

- Listing of classes placed (by room)
  A list of all preassigned classes and SCHEDULE25 assignments sorted by room.

- Listing of open rooms (by day of week and time)
  A list of all rooms by time block that are still open after the SCHEDULE25 run.

For additional information about SCHEDULE25 output files, see chapter 6.
Your institution’s computer services programming staff is responsible for developing two programs that interface with SCHEDULE25:

- A class/section extract program
- A room assignment update program

The class/section extract program selects the appropriate class section information from the course master file of your student information system, builds the Class Descriptor file, and inserts a specific SCHEDULE25 assignment code in each Class Descriptor record.

The room assignment update program reads a SCHEDULE25 output data file, finds the matching course master record in the student information system, and updates the room assignment in the course master file.

For additional information about these interface programs, see chapters 7 and 8 and the Data Preparation manual for SCHEDULE25.
A typical scheduling process using SCHEDULE25

Scheduling steps

While we recognize that your campus has its own unique room assignment process and policies, this section describes the way in which SCHEDULE25 typically fits into that process. Complete instructions and recommendations for performing each step are in chapters 7 and 8.

The steps listed below and the diagram on the next page describe what you would do in the typical scheduling process using SCHEDULE25:

1. Verify that the class section data in the course master file for the term or semester to be scheduled is correct. This includes verifying cross-listed and back-to-back or otherwise related classes, preassigning labs and other classes that require special rooms, and generally ensuring the completeness and accuracy of the data required for SCHEDULE25.

2. Request that the class/section extract program be run to generate the Class Descriptor file. At most schools, this request is automatically generated by the user; in other environments, it requires a more formal request through the computer services center.

3. Verify the accuracy of the SCHEDULE25 Campus Profile and Class Descriptor files.

4. Run SCHEDULE25 from the on-line menu or as a batch job.

5. After the SCHEDULE25 run is complete, review the reports generated by that run. If there are errors or impossible to place classes, it is usually prudent to correct the data in the course master file and/or the Campus Profile files and begin again at step 1. Depending on the nature of the errors and the number of impossible to place classes, it is also valid to edit the Class Descriptor file and simply re-run SCHEDULE25.

After reviewing the resulting assignments and the classes that weren’t placed (“losers”), you may want to edit a SCHEDULE25 output file and then use that modified file to make another pass through SCHEDULE25.

6. When you are satisfied with the assignments made by SCHEDULE25, request that the room assignment update program be run to insert the correct room assignment for each class in the course master.

7. If you have licensed 25E, the 25E Manager then loads the SCHEDULE25 sortrm.dat or sortrm.pl output file into 25E, creating a working database for all campus schedulers.
A typical scheduling process using SCHEDULE25

Typical Scheduling Process

1. **Verify section data in course master or class section file**
2. **Run class/section extract program**
3. **Verify Class Descriptor and Campus Profile files**
4. **Run SCHEDULE25**
5. **Review SCHEDULE25 reports**
6. **Errors?**
   - **Yes**
     - **Impossibles?**
       - **No**
         - **Satisfied?**
           - **Yes**
             - **End**
           - **No**
             - **Edit output file**
             - **Run room assignment update program**
8. **No**
   - **Satisfied?**
     - **Yes**
       - **End**
     - **No**
       - **Load SCHEDULE25 output into 25E**
Compatibility with 25E

The relationship between SCHEDULE25 and 25E

The 25E Event Scheduling system permits you to automatically load assignments and classes that were not placed ("losers") from any run of SCHEDULE25 into 25E. The 25E load captures SCHEDULE25 output and provides a database for future interaction with assigned classes and for assigning SCHEDULE25 "losers". For example, adding a new class section might require changing one of the assignments made by SCHEDULE25. 25E provides an easy, on-line, interactive way to reassign the room for a class or event.

The 25E date barrier

The ability to set a "date barrier" in 25E ensures that academic classes assigned through SCHEDULE25 are loaded into 25E open spaces before allowing nonacademic events to be scheduled.

Differences between Campus Profile files

The SCHEDULE25 Campus Profile files are a subset of the 25E Campus Profile files as shown here:

- ✔ = SCHEDULE25 files with a 25E equivalent
- ✥ = File used by 25E only

For more information, see the Data Preparation manual for SCHEDULE25 and 25E.
Compatibility with MODEL25

Model25 provides a point-and-click graphical user interface to the SCHEDULE25 production environment and/or modeling environment. Using your campus data, you can blackout defined sets of rooms, alter enrollments, adjust the required station utilization, and then see full-color graphical representations of the resulting SCHEDULE25 run.

For additional information, see the MODEL25 User's Guide.
Welcome to SCHEDULE25
Introduction

What’s in this chapter

This chapter describes each of the Campus Profile files (except the Control file which is described in chapter 4) and explains how SCHEDULE25 processes the information in these files.

The Campus Profile files (excluding the Control file) are:

- Physical Features (phys.dat)
- Campus Partitions (part.dat)
- Departments (depts.dat)
- Rooms (rooms.dat)

SCHEDULE25 expects the file names listed above, unless other names are specified in the runs25.com file in your SCHEDULE25 environment.

For additional information, see:

- Chapter 7 for instructions in how to verify the accuracy of these files prior to a SCHEDULE25 run.
- The Data Preparation manual for SCHEDULE25 for detailed information about the preparation and content of the Campus Profile files.

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<td>The Campus Partitions file</td>
<td>2-4</td>
</tr>
<tr>
<td>The Departments file</td>
<td>2-5</td>
</tr>
<tr>
<td>The Rooms file</td>
<td>2-7</td>
</tr>
</tbody>
</table>
The Physical Features file

**Physical Features file (phys.dat)**

The Physical Features file lists all room characteristics that classes or departments are likely to require. A physical feature can be any attribute or amenity specific to a room on your campus. Features might include such attributes as lighting, blackboards, lecterns, room type, air conditioning, wheelchair access, seating arrangement, and special equipment. Up to 96 physical features may be defined.

Each physical feature has a sequence number associated with it. The sequence number—not the description—is used in the SCHEDULE25 room profile to describe features resident in that room and in each department profile to describe features required for the placement of classes offered by that department. One or more feature sequence numbers may also be included as part of an individual Class Descriptor Physical Feature Requirements (P) record to indicate requirement(s) for particular room attributes (see page 3-19).

**Example**

Below is an example of a partial Physical Features file (phys.dat).

<table>
<thead>
<tr>
<th>Feature Description</th>
<th>Sequence Number</th>
</tr>
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<tbody>
<tr>
<td>AIR CONDITIONING</td>
<td>1</td>
</tr>
<tr>
<td>BLACKBOARDS: 20 FT</td>
<td>2</td>
</tr>
<tr>
<td>BLACKBOARDS: 40 FT</td>
<td>3</td>
</tr>
<tr>
<td>CARPETING</td>
<td>4</td>
</tr>
<tr>
<td>PODIUM</td>
<td>5</td>
</tr>
<tr>
<td>SCREEN</td>
<td>6</td>
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</tr>
<tr>
<td>WINDOW SHADES</td>
<td>10</td>
</tr>
<tr>
<td>WHEELCHAIR ACCESS</td>
<td>11</td>
</tr>
</tbody>
</table>

*feature name begins in column 1*  
*profile sequence number (col. 79 & 80)*
Because SCHEDULE25 sees physical characteristics as requirements—that is, it will not place a class in a room that does not have the required characteristics—it is possible to describe specific location requirements as a physical feature.

**Example**

South Pacific University’s main campus is in Tahiti, but some of their classes are taught in Roratonga. The English department’s profile specifies partition priorities on the Tahiti campus, but a few individual English classes must be placed on the Roratonga campus. To guarantee this, a physical feature of “Roratonga campus” is included in the profile of all rooms on the Roratonga campus, and its physical feature sequence number is included in a P record for each English class to be held on the Roratonga campus.
The Campus Partitions file

The Campus Partitions file defines campus zones, referred to as “partitions.” A partition is simply a category or grouping of rooms. Partitions are useful for focusing SCHEDULE25’s room search to specific locations on the campus or to specific types of rooms, as preferred by a department. Up to 96 partitions may be defined.

Each campus partition has a sequence number associated with it. The sequence number—not the description—is used in each SCHEDULE25 room profile to indicate in which partition the room is located and in each department profile to indicate the location preferences of the department.

A profiled department must specify first, and optionally, second, third, and fourth choices of preferred partitions. Each choice can include more than one partition; all partitions in a choice are treated equally.

SCHEDULE25 places classes only in partitions requested by the sponsoring department, unless there is an L record in the Class Descriptor file for the class. One or more partition sequence numbers can be included on a Class Descriptor Location Preference (L) record to indicate a first priority for location preference different from that of the sponsoring department (see page 3-19).

Example

Below is an example of a partial Campus Partitions file (part.dat).

<table>
<thead>
<tr>
<th>Partition Name</th>
<th>Sequence Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGLISH BUILDING</td>
<td>1</td>
</tr>
<tr>
<td>MATH BUILDING</td>
<td>2</td>
</tr>
<tr>
<td>1ST FLOOR PHYSICS BUILDING</td>
<td>3</td>
</tr>
<tr>
<td>2ND-4TH FLOOR PHYSICS BUILDING</td>
<td>4</td>
</tr>
<tr>
<td>1ST FLOOR CHEMISTRY</td>
<td>5</td>
</tr>
<tr>
<td>GYMNASIUM</td>
<td>6</td>
</tr>
<tr>
<td>LIBRARY</td>
<td>7</td>
</tr>
<tr>
<td>ART BUILDING</td>
<td>8</td>
</tr>
<tr>
<td>HISTORY QUAD</td>
<td>9</td>
</tr>
<tr>
<td>PSYCHOLOGY RESEARCH CENTER</td>
<td>10</td>
</tr>
</tbody>
</table>

Partition name begins in column 1

Profile sequence number (col. 79 & 80)
The Departments file

The Departments file profiles location (partition) preferences and, optionally, physical characteristic requirements of class sponsors. SCHEDULE25 considers a “department” to be any group of classes having a common set of location preferences. Up to 500 departments may be profiled.

Each department profile contains three to seven records describing the name of the department, the department key (abbreviation), one to four records listing campus partition preferences, and, optionally, any physical feature requirements. The four possible record types in a department profile are:

- **Name record** (required)
- **Key record** (required)
- **Campus Partitions record(s)** (at least one required)
- **Physical Features record** (optional)

Below is an example of a partial Departments file (`depts.dat`).

<table>
<thead>
<tr>
<th>One department profile</th>
<th>HISTORY</th>
<th>001 N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>HIST</td>
<td>001 K</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>0011C</td>
</tr>
<tr>
<td></td>
<td>3-5</td>
<td>0012C</td>
</tr>
<tr>
<td></td>
<td>1,2,6</td>
<td>0013C</td>
</tr>
<tr>
<td></td>
<td>7-10</td>
<td>0014C</td>
</tr>
<tr>
<td></td>
<td>7,8,10</td>
<td>001  P</td>
</tr>
<tr>
<td></td>
<td>ENGLISH</td>
<td>002 N</td>
</tr>
<tr>
<td></td>
<td>ENG</td>
<td>002 K</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>0021C</td>
</tr>
</tbody>
</table>

record begins in column 1

profile sequence number (col. 76-78)

preference sequence number (col. 79)

record type (col. 80)
The most important factor related to faculty satisfaction with SCHEDULE25 room assignments is the campus partitioning schema and the relative prioritizing of those partitions in the ranked C records of department profiles.

Example
Armstrong Hall (partition 4) houses both the Math and Physics departments offices, so both prefer classrooms in Armstrong Hall. However, the Math department (due to tradition, clout, or convenience) has a higher priority for rooms in Armstrong Hall. Therefore, partition 4 is listed as the first C record for the Math department and as the second C record for the Physics department. Because partition 4 is still the Physics department’s first choice, a bogus partition is included as its first C record.

Department file records:

- **Mathematics**
  - MATH 068 N
  - MATH 068 K
  - MATH 0681 C
  - MATH 0682 C

- **Physics**
  - PHYS 078 N
  - PHYS 079 K
  - PHYS 0791 C
  - PHYS 0792 C

1st choice, highest priority
“bogus” partition
2nd C record, lower priority than Math, but 1st choice partition

Departments (or groups of classes) with no location preferences or physical features requirements do not need a profile. SCHEDULE25 will place classes sponsored by an unprofiled department anywhere on campus, unless the Class Descriptor record indicates location preferences or physical feature requirements. However, to ensure that a department’s classes are grouped together on SCHEDULE25 reports, we recommend profiling all departments offering classes.
The Rooms file

Rooms file (rooms.dat)  The Rooms file lists all rooms into which SCHEDULE25 could place a class or to which any class in the Class Descriptor file has been preassigned. Any room that is not defined in the Rooms file is unknown to and unused by SCHEDULE25. The number of rooms that can be profiled depends on the size of the SCHEDULE25 model you’ve licensed.

Each room profile contains at least three records describing the room’s name, seating capacity, location (partition). Optionally, the profile may include any physical features in the room, one or more blackout records indicating when the room is not available to be assigned, and a minimum seat-fill percentage. The six possible record types in a room profile are:

- **Name record** (required)
- **Size record** (required)
- **Location record** (required)
- **Physical Features record** (optional)
- **Blackout record(s)** (optional)
- **Fill ratio record** (optional)

Example  Below is an example of a partial Rooms file (rooms.dat).

<table>
<thead>
<tr>
<th>one room profile</th>
<th>profile sequence number (col. 76-78)</th>
<th>blank (col. 79)</th>
<th>record type (col. 80)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 1410</td>
<td>001 N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0035</td>
<td>001 S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>001 L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1,3</td>
<td>001 P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>x x x 1100: 200P</td>
<td>001 B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.65</td>
<td>001 F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AGRI 119</td>
<td>002 N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0060</td>
<td>002 S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>002 L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ARTS 103</td>
<td>003 N</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0020</td>
<td>003 S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>003 L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15,16,20,23</td>
<td>003 P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XXXXXXXX</td>
<td>003 B</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

record begins in column 1
A room profile can include an indication of the days and times the room is unavailable (B records) and a minimum seat-fill percentage (F record).

By manipulating the minimum seat-fill ratio in a room profile (changing the value in the F record), you can dramatically alter SCHEDULE25 assignments.

Placing an F record in a room’s profile ensures that the room will only be used by SCHEDULE25 for classes which meet or exceed the designated seat fill percentage. For that room, the F record overrides the “Minimum Permissible Ratio Enrollment/Seats” value designated in the Control file (see page 4-4).

At first glance, the fill ratio option might seem redundant, since SCHEDULE25 has a built-in tendency to maximize room fullness. However, the major performance criterion for the system is to place as many classes as possible, and for a small class that is particularly difficult to assign, SCHEDULE25 might assign a room which would ordinarily be considered too large. SCHEDULE25 would make such an assignment only if all other classes that could fill the room better had at least one other placement option.

The decision to set high fill ratios is usually made solely for the purpose of pushing for higher utilization after all classes have been successfully placed.

Unless there is a specific policy at your campus which forbids the use of large rooms for small classes, we recommend that, initially, you not set high fill ratios for your ordinary scheduling runs. You should depend instead on SCHEDULE25’s built-in tendency to achieve high station utilization (seat fill).

If, in reviewing the results of a SCHEDULE25 run, you see small classes placed in rooms for which you think other classes are better suited, experiment with setting a fill ratio for the room in question.
How SCHEDULE25 Uses the Class Descriptor File

Introduction

What’s in this chapter
This chapter describes the Class Descriptor file and explains how SCHEDULE25 processes the file information.

For additional information, see:

- Chapter 7 for instructions in how to verify the accuracy of the Class Descriptor file prior to a SCHEDULE25 run.
- The Data Preparation manual for SCHEDULE25 for detailed information about the preparation and content of the Class Descriptor file.

Chapter contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
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<td>3-2</td>
</tr>
<tr>
<td>Fields in the Class Descriptor file</td>
<td>3-3</td>
</tr>
<tr>
<td>Class Descriptor file example</td>
<td>3-4</td>
</tr>
<tr>
<td>How SCHEDULE25 processes assignment codes</td>
<td>3-5</td>
</tr>
<tr>
<td>How SCHEDULE25 processes P and L records</td>
<td>3-19</td>
</tr>
</tbody>
</table>
The Class Descriptor file

Description

The Class Descriptor file contains the class/section records you want SCHEDULE25 to process, including classes whose rooms have been preassigned. This file is prepared by your institution and its record layout, which you define in the Control file, is unique to your campus.

SCHEDULE25 expects the Class Descriptor file to be called `datain.dat`, unless another filename is specified in the `runs25.com` file in your SCHEDULE25 environment. For example, to keep each semester’s Class Descriptor file intact and separate from other semesters, you could call the Class Descriptor files `datain.F97`, `datain.S98`, and so on. If you do this, make sure the correct filename is indicated in the `runs25.com` file before running SCHEDULE25. For more information about the `runs25.com` file, see the Installation and Setup manual for SCHEDULE25.

Record types

Each Class Descriptor record set contains one to three records describing a class/section, including date information, days of the week, times, enrollment, any physical feature requirements, and any location preferences. The three record types are:

- **M** record (required) - class enrollment, time information, and assignment code
- **P**hysical Feature Requirements record (optional) - any physical feature requirements of the class
- **L**ocation Preference record (optional) - any location preferences of the class
Fields in the Class Descriptor file

Each record in the Class Descriptor file includes the following fields (listed alphabetically) which are required by SCHEDULE25:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/P Designator</td>
<td>This field contains “A” if the class ends in the morning (before noon), “P” if the class ends in the afternoon or evening, and “H” if the class time is specified in military terms (0000-2400 hours).</td>
</tr>
<tr>
<td>Assignment Code</td>
<td>This field contains a three character code that tells SCHEDULE25 how to process the record (for more information, see page 3-5).</td>
</tr>
<tr>
<td>Days of Week</td>
<td>This field contains one or two-character day of the week abbreviations that indicate on which days the class meets.</td>
</tr>
<tr>
<td>Department</td>
<td>This field indicates the organizational entity sponsoring the class.</td>
</tr>
<tr>
<td>Enrollment</td>
<td>This field contains the class enrollment (usually estimated or maximum) or the default enrollment specified in the Control file (see page 4-5).</td>
</tr>
<tr>
<td>Finish Hours</td>
<td>Finish Hours contains a number from 1-12 (or 0-24 if you are using military time) that indicates the hour the class ends.</td>
</tr>
<tr>
<td>Finish Minutes</td>
<td>Finish Minutes contains a two digit number from 00-59 that indicates the minute the class ends.</td>
</tr>
<tr>
<td>Room Name</td>
<td>This field may be blank if the record contains an assignment code indicating that SCHEDULE25 is to make the room assignment (see page 3-6). If a room has been preassigned to the class, this field contains a valid room name from the rooms.dat file.</td>
</tr>
<tr>
<td>Start/Finish Week</td>
<td>This field indicates the date span of the class. It contains either the numerical calendar start week and finish week of the class or the beginning date and end date of the class.</td>
</tr>
<tr>
<td>or Begin/End Dates</td>
<td></td>
</tr>
<tr>
<td>Start Hours</td>
<td>Start Hours contains a number from 1-12 (or 0-24 if you are using military time) that indicates the hour the class begins.</td>
</tr>
<tr>
<td>Start Minutes</td>
<td>Start Minutes contains a two digit number from 00-59 that indicates the minute the class begins.</td>
</tr>
</tbody>
</table>

Your Class Descriptor records may include additional information such as faculty name. SCHEDULE25 does not use this information in processing, but does show it on SCHEDULE25 report listings.
Class Descriptor file example

Below is a portion of a Class Descriptor file. Because the institution that created this Class Descriptor file also uses 25E, their Class Descriptor records can be up to 253 characters long. Only the first 80 characters are used by SCHEDULE25. The assignment code is always in columns 78-80. (Assignment code information begins on the next page.)

<table>
<thead>
<tr>
<th>Assignment Code</th>
<th>Days</th>
<th>Hours</th>
<th>Date</th>
<th>Time</th>
<th>Code</th>
<th>Class Type</th>
<th>Code</th>
<th>Class Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>TR</td>
<td>0930-1020</td>
<td>99</td>
<td>FA 09/09</td>
<td>12/19</td>
<td>NSH MOGENIE</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>P</td>
<td>TR</td>
<td>1030-1150</td>
<td>90</td>
<td>FA 09/09</td>
<td>12/19</td>
<td>NSH MOGENIE</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>L</td>
<td>TR</td>
<td>1100-1230</td>
<td>30</td>
<td>FA 09/09</td>
<td>12/19</td>
<td>NSH MOGENIE</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>L</td>
<td>1300-1420</td>
<td>15</td>
<td>FA 09/09</td>
<td>12/20</td>
<td>NSH MOGENIE</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>1330-1620</td>
<td>50</td>
<td>FA 09/09</td>
<td>12/16</td>
<td>NSH SMITH</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>1330-1620</td>
<td>25</td>
<td>FA 09/09</td>
<td>12/16</td>
<td>MM A14</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>1330-1545</td>
<td>75</td>
<td>FA 09/09</td>
<td>12/16</td>
<td>MM A14</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>1330-1420</td>
<td>25</td>
<td>FA 09/09</td>
<td>12/15</td>
<td>MM A14</td>
<td>ACA</td>
<td>CLS</td>
</tr>
<tr>
<td>M</td>
<td>N</td>
<td>1330-1420</td>
<td>15</td>
<td>FA 09/09</td>
<td>12/15</td>
<td>MM A14</td>
<td>ACA</td>
<td>CLS</td>
</tr>
</tbody>
</table>

examples of M, P, and L records

assignment code
How SCHEDULE25 processes assignment codes

Overview

The assignment code lets SCHEDULE25 know how to process the Class Descriptor record. Your class/section extract program automatically inserts the appropriate assignment code in columns 78-80 of each Class Descriptor record based on information in your student information system about how each class should be processed.

Some assignment codes tell SCHEDULE25 to assign the class to a room. Other assignment codes tell SCHEDULE25 that the class already has a room assignment—that it is preassigned.

The assignment code can tell SCHEDULE25 that the class:

- Needs a room assignment.
- Needs a room assignment but prefers the room indicated in the Room Name field.
- Needs a room assignment but must be placed in the same room as the previously listed class.
- Can be assigned to a room containing other classes.
- Is cross-listed with one or more classes.
- Has been preassigned to the room named in the Room Name field.
Ideally, the majority of records in your Class Descriptor file should have assignment codes requesting SCHEDULE25 to make the room assignment, that is, *most should not be preassigned*. Although you may include preassigned classes in your Class Descriptor file, the assignment algorithm performs best when it is asked to do most or all of the work of finding rooms for classes. (For information about preassignment codes, see page 3-14.)

Seven assignment codes indicate to SCHEDULE25 that the class is requesting a room assignment by SCHEDULE25:

<table>
<thead>
<tr>
<th>This code...</th>
<th>Indicates...</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSM</td>
<td>A class requesting <em>(needing)</em> a room assignment.</td>
</tr>
<tr>
<td>1SM</td>
<td>A class requesting a room assignment, but with a preferred <em>(1st choice)</em> room.</td>
</tr>
<tr>
<td>WSM</td>
<td>A class requesting a room assignment that is with the previous NSM or 1SM record and therefore must be assigned to the same room at the same time (cross-listed class).</td>
</tr>
<tr>
<td>RSM</td>
<td>A class requesting a room assignment that is related to the previous NSM or 1SM record and therefore must be assigned to the same room but at a different time.</td>
</tr>
<tr>
<td>NXM</td>
<td>A class requesting <em>(needing)</em> a room assignment, but which may share a room with another class whose times overlap with it. This allows SCHEDULE25 to “double-book” two or more unrelated classes into the same room.</td>
</tr>
<tr>
<td>1XM</td>
<td>A class requesting a room assignment, and the class has a preferred <em>(1st choice)</em> room and can share a room with another class whose times overlap with it. (that is, can be “double-booked” like an NXM class).</td>
</tr>
<tr>
<td>RXM</td>
<td>A class requesting a room assignment that is related to the previous NXM or 1XM record and therefore must be assigned to the same room at the same or overlapping times.</td>
</tr>
</tbody>
</table>
When SCHEDULE25 assigns a room for a class, it copies the name of the room from the N (name) record of the room’s profile into the Room Name field of the Class Descriptor record as shown in this example:

Before processing: MATH101A MWF 8:00 8:50 35 09/07 12/15 NSM
After processing: MATH101A MWF 8:00 8:50 35 09/07 12/15 SMITH201 5SM
**How SCHEDULE25 Uses the Class Descriptor File**

**How SCHEDULE25 processes request codes**

**NSM**
The Class Descriptor record with an NSM code has no room assignment. Even if a room name appears in the Room Name field (perhaps to indicate the room the class was assigned to last term), SCHEDULE25 ignores it and reads the NSM code as a request for a room assignment. Any data in the Room Name field is overwritten with the SCHEDULE25 room assignment.

After making the room assignment for an NSM record, SCHEDULE25 changes the “N” in the assignment code to “5”.

Example:

**Before processing:** MATH101A MWF 8:00 8:50 35 09/07 12/15 NSM

**After processing:** MATH101A MWF 8:00 8:50 35 09/07 12/15 SMITH201 5SM

**1SM**
The Class Descriptor record with a 1SM code (numeral “1”, letter “S”, letter “M”) has no room assignment, but it has a preferred (1st choice) room. That room, which is specified in the record’s Room Name field, must match a room in the SCHEDULE25 `rooms.dat` file.

Using a 1SM code limits the initial pool of candidate rooms considered by SCHEDULE25 for that class to the designated room. If the room is closed at the requested time (either as a result of a SCHEDULE25 assignment or a preassignment), SCHEDULE25 treats the 1SM class as an NSM class.

If a class that is not coded 1SM (usually an NSM class) has only one potential room into which it could be placed and that room happens to be the 1SM’s preferred room, and if that non-1SM class is a better match for the room because of feature requirements, department preferences, or utilization, SCHEDULE25 will place the non-1SM class into the room and the 1SM class into another room.

After making the room assignment for a 1SM record, SCHEDULE25 changes the “1” in the assignment code to “5”.

Example:

**Before processing:** ENG202A MWF 8:00 8:50 35 09/07 12/15 SPENCER456 1SM

**After processing:** ENG202A MWF 8:00 8:50 35 09/07 12/15 SPENCER456 5SM
You may want SCHEDULE25 to assign the same room to two or more classes that have different meeting times. For example, if an instructor teaches two classes consecutively, you may want to ensure that SCHEDULE25 assigns the same room to both classes.

NSM and 1SM records can be followed by any number of RSM records indicating classes that must be assigned to the same room as the NSM or 1SM record but at a different date or time. Any Class Descriptor record with the RSM code is "related" to the preceding NSM or 1SM record.

Classes in an NSM/RSM or 1SM/RSM group need not have consecutive meeting times or identical information in the days, start time, finish time, department, or enrollment fields. If the enrollment values differ, SCHEDULE25 selects a room that accommodates the largest class in the group. However, no pair of related records can have overlapping meeting times (NXM/RXM codes are used for overlapping requests. See pages 3-9 and 3-13.)

After making the room assignment for an RSM record, SCHEDULE25 changes the “R” in the assignment code to “S”.

Example:

**Before processing:**

MATH101A MWF 8:00 8:50 35 09/07 12/15 NSM
MATH101A MWF 9:00 9:50 30 09/07 12/15 RSM

**After processing:**

MATH101A MWF 8:00 8:50 35 09/07 12/15 SMITH201 5SM
MATH101A MWF 9:00 9:50 30 09/07 12/15 SMITH201 5SM
WSM

NSM or 1SM records can be followed by any number of WSM records indicating a set of cross-listed classes that must be assigned to the same room as the NSM or 1SM record. Any Class Descriptor record with a WSM code is cross-listed “with” the preceding NSM or 1SM record.

SCHEDULE25 determines the capacity of the room needed for the cross-listed classes by checking the “Sum Cross-listed Enrollments” parameter in the Control file (see page 4-6). If the parameter value is “NO” (don’t sum cross-listed enrollments), SCHEDULE25 looks for a room that fits the enrollment in the NSM record. If the parameter value is “YES” (do sum cross-listed enrollments), SCHEDULE25 adds the enrollments for all cross-listed classes in the group and looks for a room with a capacity equal to or greater than the sum.

Example

Dogwood College has a group of cross-listed classes, MATH101, STAT101, and ENGR101 that they want to ensure are assigned to the same room at the same time. Their Class Descriptor file contains a record for each of the three classes. All three classes have the same date/time and enrollment information. Only the departments and assignment codes are different.

MATH101 has an NSM assignment code. STAT101 and ENG101 have WSM assignment codes.

All classes in an NSM/WSM or 1SM/WSM group must have identical information in the days, start time, finish time, and dates (or start week/finish week) fields. Only the contents of the department, enrollment, and assignment code fields may differ.

After making the room assignment for a WSM record, SCHEDULE25 leaves the WSM code unaltered.

Example:

<table>
<thead>
<tr>
<th>Before processing:</th>
<th>After processing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH101 MWF 9:00 9:50 35 09/07 12/15</td>
<td>MATH101 MWF 9:00 8:50 35 09/07 12/15 SMITH201 5SM</td>
</tr>
<tr>
<td>STAT101 MWF 9:00 9:50 35 09/07 12/15</td>
<td>STAT101 MWF 9:00 9:50 35 09/07 12/15 SMITH201 WSM</td>
</tr>
<tr>
<td>ENGR101 MWF 9:00 9:50 35 09/07 12/15</td>
<td>ENGR101 MWF 9:00 9:50 35 09/07 12/15 SMITH201 WSM</td>
</tr>
</tbody>
</table>
NXM
The Class Descriptor record with an NXM code is requesting a room, and the room that is assigned to it can be assigned at the same or overlapping times to any classes with RXM assignment codes that follow (see page 3-13). If a room name appears in the Room Name field (perhaps to indicate the room the class was assigned to last term), SCHEDULE25 ignores it and reads the NXM code as a request for a room assignment. Any data in the Room Name field is overwritten with the SCHEDULE25 room assignment.

After making the room assignment for an NXM record, SCHEDULE25 changes the “N” in the assignment code to “5”.

Example:

<table>
<thead>
<tr>
<th>Before processing:</th>
<th>After processing:</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHIL100 MWF 8:00 8:50 35 09/07 12/15 NXM</td>
<td>PHIL100 MWF 8:00 8:50 35 09/07 12/15 GATE455 5XM</td>
</tr>
<tr>
<td>PHIL500 MWF 8:30 9:50 20 09/07 12/15 RXM</td>
<td>PHIL500 MWF 8:30 9:50 20 09/07 12/15 GATE455 5XM</td>
</tr>
</tbody>
</table>
The Class Descriptor record with a 1XM code (numeral “1”, letter “X”, letter “M”) has no room assignment, but it has a preferred (1st choice) room and that room can be assigned at the same or overlapping times to the classes with RXM assignment codes that follow (see page 3-13). The room specified in the record’s Room Name field must match a room in the SCHEDULE25 rooms.dat file.

Using a 1XM code limits the initial pool of candidate rooms considered by SCHEDULE25 for that class and its associated RXM classes to the designated room. If the room is closed at the requested time (either as a result of a SCHEDULE25 assignment or a preassignment), SCHEDULE25 treats the 1XM class as an NXM class.

If a class that is not coded 1XM (usually an NXM class) has only one potential room into which it could be placed and that room happens to be the 1XM’s preferred room, and if that non-1XM class is a better match for the room because of department preferences or utilization, SCHEDULE25 will place the non-1XM class into the room and the 1XM class into another room.

After making the room assignment for a 1XM record, SCHEDULE25 changes the “1” in the assignment code to “5”.

Example:

Before processing:

<table>
<thead>
<tr>
<th>Class</th>
<th>Day</th>
<th>Time</th>
<th>Section</th>
<th>Start Date</th>
<th>End Date</th>
<th>Room</th>
<th>Assignment Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG101</td>
<td>TH</td>
<td>13:00</td>
<td>13:50</td>
<td>40</td>
<td>09/07</td>
<td>NORTON306</td>
<td>1XM</td>
</tr>
<tr>
<td>GEOG401</td>
<td>TH</td>
<td>13:30</td>
<td>15:00</td>
<td>25</td>
<td>09/07</td>
<td>NORTON306</td>
<td>RXM</td>
</tr>
</tbody>
</table>

After processing:

<table>
<thead>
<tr>
<th>Class</th>
<th>Day</th>
<th>Time</th>
<th>Section</th>
<th>Start Date</th>
<th>End Date</th>
<th>Room</th>
<th>Assignment Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG101</td>
<td>TH</td>
<td>13:00</td>
<td>13:50</td>
<td>40</td>
<td>09/07</td>
<td>NORTON306</td>
<td>5XM</td>
</tr>
<tr>
<td>GEOG401</td>
<td>TH</td>
<td>13:30</td>
<td>15:00</td>
<td>25</td>
<td>09/07</td>
<td>NORTON306</td>
<td>5XM</td>
</tr>
</tbody>
</table>
RXM
NXM and 1XM records can be followed by any number of RXM records indicating related, double-booked classes that can be assigned to the same room at the same or overlapping times as the previous NXM or 1XM record. Any Class Descriptor record with the RXM code is “related” by assignment to the preceding NXM or 1XM record.

Classes in an NXM/RXM or 1XM/RXM group need not have identical information in the department or enrollment fields, but can have the same or overlapping times. If the enrollment values differ, SCHEDULE25 selects a room that accommodates the largest class in the group.

After making the room assignment for an RXM record, SCHEDULE25 changes the “R” in the assignment code to “5”.

Example:

Before processing:

PHIL100 MWF 8:00 8:50 35 09/07 12/15 NXM
PHIL500 MWF 8:30 9:50 20 09/07 12/15 RXM

After processing:

PHIL100 MWF 8:00 8:50 35 09/07 12/15 GATE455 5XM
PHIL500 MWF 8:30 9:50 20 09/07 12/15 GATE455 5XM
You may occasionally want to preempt the assignment function of SCHEDULE25 by preassigning a class to a room. Reasons to preassign a class might include:

- Honoring a powerful professor who traditionally teaches in a particular room
- Blacking out a room for a range of weeks
- Placing technical lab classes into specialized lab rooms

We suggest that you try to keep preassignments to a minimum, because they can hinder SCHEDULE25’s optimizing capabilities. SCHEDULE25 is better able to optimize space and honor departmental location preferences by using well-designed Campus Profiles and the physical characteristic and location preferences of individual classes.

In working with preassignments, be aware that:

- A class with a “preassign” assignment code but with no room name in the Room Name field generates an error message.
- A class with a “preassign” assignment code but whose requested room is not in the Rooms file (rooms.dat) generates an error message.
- Every class you want to preassign to a SCHEDULE25 room must have a record in the Class Descriptor file. If you don’t include a Class Descriptor record for a preassigned class, the room you wanted for that class is available for assignment by SCHEDULE25.
- SCHEDULE25’s treatment of preassigned classes is confined to a syntax and conflict check. SCHEDULE25 accepts a preassignment even if:
  - The enrollment for the class exceeds the room capacity.
  - The room is blacked out at the times assigned to the class.
  - The room fill ratio in effect for the preassigned room is higher than the fill ratio achieved by the preassignment.
Four types of assignment codes indicate to SCHEDULE25 that the class has been preassigned to a SCHEDULE25 profiled room:

<table>
<thead>
<tr>
<th>This code...</th>
<th>Indicates...</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASM</td>
<td>A single class that has been preassigned manually, probably in the student information system.</td>
</tr>
<tr>
<td>AXM</td>
<td>A class that has been preassigned manually and its time span overlaps part or all of the time span of another class assigned to the same room (double-booked).</td>
</tr>
<tr>
<td>HSM/VSM</td>
<td>A group of two or more preassigned cross-listed classes. The first record in the group is the Home record; the other records in the group are Visitors.</td>
</tr>
<tr>
<td>5SM</td>
<td>A SCHEDULE25 assigned class.</td>
</tr>
<tr>
<td>5XM</td>
<td>A SCHEDULE25 assigned class, double-booked in a room with another class.</td>
</tr>
</tbody>
</table>

SCHEDULE25 does not alter the assignment code of preassigned records during processing.
How SCHEDULE25 uses the Class Descriptor File

ASM
The ASM code is used to indicate that the class was preassigned to the room whose name appears in the Room Name field either manually or by a system other than SCHEDULE25, and that it is believed to be the only class assigned to that room at the specified day/time.

SCHEDULE25 checks for time conflicts among all classes coded ASM. Whenever two ASM records specify the same room name and the meeting times overlap, SCHEDULE25 places only the second record in the conflict pair. Both records and the associated diagnostic message are written to the Diagnostics For Erroneously Prepared Records report.

Example:

MATH101A MWF 8:00 8:50 35 09/07 12/15 SPENCER25 ASM

AXM
The AXM code is used to indicate that the class was preassigned to the room whose name appears in the Room Name field either manually or by a system other than SCHEDULE25, and that it is double-booked or intentionally conflicts with one or more classes in the same room during all or part of the same time span.

SCHEDULE25 treats AXM records like ASM records, except that it will not diagnose a record as erroneous when its meeting time overlaps with that of another AXM record. SCHEDULE25 does, however, diagnose as erroneous any AXM record whose meeting time overlaps with that of an ASM record. AXM records should not be used for cross-listed classes, because SCHEDULE25 would not detect erroneous conflicts.

Example:

GEOG101 TH 13:00 13:50 40 09/07 12/15 NORTON306 AXM
GEOG401 TH 13:30 15:00 25 09/07 12/15 NORTON306 AXM

Associated AXM records do not have to be contiguous in the Class Descriptor file.
HSM/VSM
HSM and VSM assignment codes are used to indicate that more than one class is preassigned to the same room at the same meeting days and time. These groups are often referred to as “cross-listed,” “dual-listed,” “stacked,” or some other term that indicates that while the class may be offered by different departments or even with different course numbers, they all meet in the same room at the same time and generally have the same instructor.

The HSM (Home) assignment code is assigned to the first record of the cross-listed group, and the VSM (Visitor) code to the subsequent records. In SCHEDULE25, these records do not have to be contiguous; in 25E, they do.

SCHEDULE25 treats an HSM/VSM group of classes in the same manner as an ASM class. The HSM/VSM group may not have a conflicting meeting time with any ASM, AXM, or 5SM class, or other HSM/VSM group.

Example:

CHEM301 TTH 9:00 9:50 35 09/07 12/15 SMITH201 HSM
PHYS301 TTH 9:00 9:50 20 09/07 12/15 SMITH201 VSM
BIOL301 TTH 9:00 9:50 30 09/07 12/15 SMITH201 VSM
How SCHEDULE25 processes preassignment codes, continued

5SM
The 5SM assignment code indicates that the class was assigned by SCHEDULE25 to the room whose name appears in the Room Name field.

SCHEDULE25 processes 5SM and ASM records identically. SCHEDULE25 verifies that any class coded 5SM is the only class assigned to that room at the designated time. Any conflicts are written to the diagnostics file.

When SCHEDULE25 assigns a room during the run, it changes the first letter of the assignment code to “5” to indicate a SCHEDULE25 assignment (except WSM records). You may want to use this feature to edit an output file and rerun SCHEDULE25, as illustrated in the example below.

Example
The Art building on the Acacia State University campus was destroyed by fire shortly after the term began. The scheduler was asked to determine if it was possible to find rooms for the displaced classes without having to change the assignments already made to classes that do not meet in the Art building.

To determine this, the scheduler edited a SCHEDULE25 output file (sortrm.dat) from the most recent SCHEDULE25 run and changed the 5SM code to NSM for each class assigned to the destroyed building, created B (blackout) records for all rooms in the Art building, and then submitted the edited file to SCHEDULE25. Since all the classes that did not meet in the Art building were already assigned 5SM or some other preassignment code, SCHEDULE25 attempted to find new rooms only for those classes coded NSM - the displaced Art building classes.

Generally, resubmitting SCHEDULE25 assignments as preassignments is not recommended, since the larger the number of preassignments fed to SCHEDULE25, the less flexibility the system has in meeting its optimization objectives. You could build your original classroom assignments through a series of runs in which a few assignments were made and then cumulatively carried forward, but doing so could significantly undermine SCHEDULE25’s optimizing capabilities.

5XM
The 5XM assignment code indicates that the class was assigned by SCHEDULE25 to the room whose name appears in the Room Name field and that it is double-booked with one or more classes in the same room during all or some of the same time span.

You can edit 5XM records as described above for 5SM records.
How SCHEDULE25 Processes P and L records

P records

When SCHEDULE25 processes room requests, it looks at the profile of the department sponsoring each class. If the department profile contains a P record specifying physical features required for all classes sponsored by that department, SCHEDULE25 restricts its search to only those rooms containing the specified features. (The search is also restricted to the partitions specified in the department C record(s).)

However, by assigning a P record to a Class Descriptor record set, you can override the department's physical feature requirements for that class.

Whether physical features are specified in the department profile or in the Class Descriptor file, they must be specified by their sequence number as defined in the Physical Features file. (See page 2-2.)

Note that while any room that meets the physical feature requirements of a class always contains the combination of features listed on the P record, the room may contain more features than those listed on the P record.

SCHEDULE25 will not place a class if it cannot find a room with all of the required physical features in any of the requested partitions. When a class requires more than one physical feature, SCHEDULE25 treats the feature requirements as a series of “ands”, not “ors”. For example, a class can request features 7 and 12, but not 7 or 12.
How SCHEDULE25 Uses the Class Descriptor File

When SCHEDULE25 encounters a P record following an NSM record, it carries out its search for a room by following the partition clustering strategy defined for the department offering the class. The search is restricted, however, to rooms containing the combination of features listed on the class P record.

When SCHEDULE25 encounters a P record following a 1SM record, it initially ignores the P record and attempts to place the class in its preferred room. (The preferred room does not need to contain the requested combination of features.) If SCHEDULE25 cannot place the class in its preferred room, it treats the 1SM record as if it were an NSM record: that is, it follows the partition clustering strategy defined for the department offering the class, and restricts its search to rooms containing the combination of features listed on the P record.

When SCHEDULE25 encounters a blank P record, that is, the record has no sequence numbers or position markers, SCHEDULE25 ignores the physical feature requirements in the department’s profile when scheduling the class. For example, if the Math department has been profiled so that rooms assigned to its classes must contain a certain footage of blackboard space, but a particular section of Math200 does not have that requirement, including a blank P record for the class in the Class Descriptor file causes SCHEDULE25 to ignore the department’s physical feature requirement for that class only. This would allow SCHEDULE25 to consider more rooms in its room search for the class.

L records

When SCHEDULE25 processes room requests, it follows the partition clustering strategy defined in C records in the sponsoring department’s profile. SCHEDULE25 restricts its search to those rooms located in the specified partitions. (The search is further restricted to rooms containing any physical features requirements specified in the department’s P record.)

However, by assigning an L record to a Class Descriptor record set, you can request, for an individual class, placement in one or more partitions other than those specified in the department’s partition clustering strategy.

An L record does not guarantee placement in the designated partition(s). SCHEDULE25 tries to place the class in the partition(s) designated in the L record, but if no acceptable room is available, it turns its search to the partitions defined in the sponsoring department’s partition clustering strategy.

Whether partitions are specified in the department profile or in the Class Descriptor file, they must be specified by their sequence number as defined in the Partitions file. (See page 2-4.)
How SCHEDULE25 processes L records

- When SCHEDULE25 encounters an L record following an NSM record, it restricts its initial room search to the partition(s) designated in the L record. If it cannot place the class in any of those partitions, it turns its search to the partition(s) defined in the sponsoring department’s profile.

- When SCHEDULE25 encounters an L record following a 1SM record, it initially ignores the L record and attempts to place the class in its preferred room. (The preferred room does not need to be in any of the preferred partitions.) If SCHEDULE25 can’t place the class in its preferred room, it attempts to place it in one of the partitions designated in the L record. Finally, if SCHEDULE25 can’t place the class in any of those partitions, it follows the partition clustering strategy defined for the department offering the class.

- When SCHEDULE25 encounters a blank L record, that is, the record has no sequence numbers or position markers, SCHEDULE25 ignores it and follows the department partition clustering strategy.

The affect of using both P and L records

- When SCHEDULE25 encounters both a P record and an L record following an NSM record, it restricts its initial room search to rooms in the partitions defined by the L record that have all the physical features designated on the P record. If SCHEDULE25 can’t place the class within that group of rooms, it turns to the partition clustering strategy defined for the department offering the class, restricting its search to rooms containing the features listed on the P record.

- When SCHEDULE25 encounters both a P record and an L record following a 1SM record, it initially ignores the P and L records and attempts to place the class in its preferred room. If SCHEDULE25 can’t place the class in the preferred room, the P and L records affect SCHEDULE25’s placement strategy as if the 1SM record were an NSM record.
34 How SCHEDULE25 Uses the Class Descriptor File
How SCHEDULE25 Uses the Control File

Introduction

What’s in this chapter

This chapter describes the processing records of the Control file and explains how the parameters in these records affect the scheduling process.

For additional information, see:

- Chapter 7 for guidance in setting Control file parameters prior to a SCHEDULE25 run.
- The Data Preparation manual for SCHEDULE25 for detailed information about the preparation and content of all records in the Control file.

Chapter contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Control file</td>
<td>4-2</td>
</tr>
<tr>
<td>Control file processing records</td>
<td>4-4</td>
</tr>
<tr>
<td>How SCHEDULE25 uses processing parameters</td>
<td>4-7</td>
</tr>
</tbody>
</table>
The Control file

<table>
<thead>
<tr>
<th>Purpose of file</th>
<th>The Control file shown on the next page has two purposes:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>☐ To define the Class Descriptor record layout</td>
</tr>
<tr>
<td></td>
<td>☐ To influence the scheduling process</td>
</tr>
</tbody>
</table>
Below is an example of the Control file (*ctrl.dat*). The records in bold contain the processing parameters that influence the scheduling process.

Parameter value begins in column 1

<table>
<thead>
<tr>
<th>Parameter Value</th>
<th>Column</th>
</tr>
</thead>
<tbody>
<tr>
<td>FIRST COLUMN OF ROOM NAME</td>
<td>01</td>
</tr>
<tr>
<td>LENGTH OF ROOM NAME FIELD</td>
<td>02</td>
</tr>
<tr>
<td>LENGTH OF DAYS FIELD</td>
<td>03</td>
</tr>
<tr>
<td>ABBREVIATION FOR SUNDAY</td>
<td>04</td>
</tr>
<tr>
<td>ABBREVIATION FOR MONDAY</td>
<td>05</td>
</tr>
<tr>
<td>ABBREVIATION FOR TUESDAY</td>
<td>06</td>
</tr>
<tr>
<td>ABBREVIATION FOR WEDNESDAY</td>
<td>07</td>
</tr>
<tr>
<td>ABBREVIATION FOR THURSDAY</td>
<td>08</td>
</tr>
<tr>
<td>ABBREVIATION FOR FRIDAY</td>
<td>09</td>
</tr>
<tr>
<td>ABBREVIATION FOR SATURDAY</td>
<td>10</td>
</tr>
<tr>
<td>FIRST COLUMN OF DAYS FIELD</td>
<td>11</td>
</tr>
<tr>
<td>START HOURS (FIRST COLUMN)</td>
<td>12</td>
</tr>
<tr>
<td>START MINUTES (FIRST COLUMN)</td>
<td>13</td>
</tr>
<tr>
<td>FINISH HOURS (FIRST COLUMN)</td>
<td>14</td>
</tr>
<tr>
<td>FINISH MINUTES (FIRST COLUMN)</td>
<td>15</td>
</tr>
<tr>
<td>COLUMN OF A/P DESIGNATOR</td>
<td>16</td>
</tr>
<tr>
<td>FIRST COLUMN OF FOUR COLUMN ENROLLMENT FIELD</td>
<td>17</td>
</tr>
<tr>
<td>COLUMN OF FIRST DIGIT OF THE CONFLICT DECIDER</td>
<td>18</td>
</tr>
<tr>
<td>COLUMN OF SECOND DIGIT OF THE CONFLICT DECIDER</td>
<td>19</td>
</tr>
<tr>
<td>COLUMN OF THIRD DIGIT OF THE CONFLICT DECIDER</td>
<td>20</td>
</tr>
<tr>
<td>COLUMN OF FOURTH DIGIT OF THE CONFLICT DECIDER</td>
<td>21</td>
</tr>
<tr>
<td>COLUMN OF FIFTH DIGIT OF THE CONFLICT DECIDER</td>
<td>22</td>
</tr>
<tr>
<td>FIRST COLUMN OF DEPARTMENTAL ID</td>
<td>23</td>
</tr>
<tr>
<td>MINIMUM PERMISSIBLE RATIO ENROLLMENT/SEATS</td>
<td>24</td>
</tr>
<tr>
<td>ENROLLMENT ADJUSTER</td>
<td>25</td>
</tr>
<tr>
<td>DEFAULT ENROLLMENT INDICATOR</td>
<td>26</td>
</tr>
<tr>
<td>DEFAULT ENROLLMENT</td>
<td>27</td>
</tr>
<tr>
<td>MINIMUM CORRECT INPUT FRACTION</td>
<td>28</td>
</tr>
<tr>
<td>LENGTH OF DEPARTMENTAL ID</td>
<td>29</td>
</tr>
<tr>
<td>NUMBER OF WEEKS IN TERM</td>
<td>30</td>
</tr>
<tr>
<td>FIRST COLUMN OF START WEEK</td>
<td>31</td>
</tr>
<tr>
<td>FIRST COLUMN OF FINISH WEEK</td>
<td>32</td>
</tr>
<tr>
<td>MINI-CLASSES?</td>
<td>33</td>
</tr>
<tr>
<td>EXTRA FINISH MINUTES</td>
<td>34</td>
</tr>
<tr>
<td>EARLIEST START TIME</td>
<td>35</td>
</tr>
<tr>
<td>LATEST FINISH TIME</td>
<td>36</td>
</tr>
<tr>
<td>SUM CROSS-LISTED ENROLLMENTS</td>
<td>37</td>
</tr>
<tr>
<td>MAXIMUM LENGTH OF DESCRIPTOR RECORD</td>
<td>38</td>
</tr>
<tr>
<td>FIRST COLUMN OF BEGIN MONTH</td>
<td>39</td>
</tr>
<tr>
<td>FIRST COLUMN OF BEGIN DAY OF MONTH</td>
<td>40</td>
</tr>
<tr>
<td>FIRST COLUMN OF END MONTH</td>
<td>41</td>
</tr>
<tr>
<td>FIRST COLUMN OF END DAY OF MONTH</td>
<td>42</td>
</tr>
</tbody>
</table>
Control file processing records

These are descriptions of the records in the Control file that affect the SCHEDULE25 scheduling process and assignments. Pages 4-7 to 4-11 explain how SCHEDULE25 uses the parameter settings during the assignment process.

Records 18-22

COLUMN OF <placement> DIGIT OF THE CONFLICT DECIDER

Records 18-22 specify five columns of the Class Descriptor record from which SCHEDULE25 can determine a “conflict decider”. The conflict decider is a user-defined weight given to each class that SCHEDULE25 uses to break a tie among classes with identical requirements competing for the same room at the same time. In this competition, the class with the highest conflict decider number is placed in the room. A blank in this parameter field is interpreted as a zero (0).

Example: 19

Record 24

MINIMUM PERMISSIBLE RATIO ENROLLMENT/SEATS

A number that specifies the minimum percentage of seats in a room that must be filled by any SCHEDULE25 room assignment. For example, if the value of this parameter is 0.20 (20%), SCHEDULE25 will place a class into a room only if the class fills at least 20% of the room’s seats. The only exception to this is if an individual room profile includes its own fill ratio specification (F record in the rooms.dat file). In that case, the room’s fill ratio overrides this Control file record.

SCHEDULE25 ignores this field for preassignments.

Example: 0.10 (10%)

Record 25

ENROLLMENT ADJUSTER

A number that specifies the percentage by which SCHEDULE25 is to adjust the enrollments appearing on the Class Descriptor records prior to initiating the assignment algorithm. SCHEDULE25 does not change or overwrite the data in the Enrollment field. It merely uses the adjusted value internally during the room assignment process.

Example: 0.90 (90%)
DEFAULT ENROLLMENT INDICATOR

A four-character string that appears in the Enrollment field of a Class Descriptor record when the enrollment data for a class is unavailable in the student information system. SCHEDULE25 internally substitutes the value designated as the “Default Enrollment” (see record 27 below) for any record containing this indicator.

Example: ****

Record 27

DEFAULT ENROLLMENT

A number that indicates the value that is to be substituted in the Enrollment field when SCHEDULE25 encounters a “Default Enrollment Indicator”. You can use this parameter to provide SCHEDULE25 with an estimated enrollment for those classes which have none.

Example: 0035

Record 28

MINIMUM CORRECT INPUT FRACTION

A number that indicates the minimum percentage of Class Descriptor records that must be correct before SCHEDULE25 will perform its assignment function.

Example: 0.80 (80%)

Record 30

NUMBER OF WEEKS IN TERM

A two digit number from 01-54 that indicates the maximum span of weeks represented by the classes in the Class Descriptor file. For example, if most classes in the file fall within the regular 16 week semester, but a few classes begin two weeks earlier and end two weeks earlier, this parameter should be set to 18.

Example: 16
MINI-CLASSES?
This field indicates whether or not the Class Descriptor file contains events that are less than a full term long (as defined in record 30). If this parameter is set to “YES”, SCHEDULE25 uses the Start Week/Finish Week field in determining the duration of room assignments. If this record is set to “NO”, SCHEDULE25 ignores the Start Week/Finish Week field and any date fields and assumes that all classes are of equal duration. If this record is set to “DATES”, SCHEDULE25 uses the Begin/End Date fields in determining the duration of room assignments.
Example: DATES

EXTRA FINISH MINUTES
A digit from 0-30 that specifies the number of minutes, if any, SCHEDULE25 must add internally to the finish time of each class when making room assignments. If a non-zero value is specified, SCHEDULE25 internally and automatically adds that value to the finish time of every Class Descriptor record prior to initiating the assignment algorithm. You can use this automatic “pad” to provide enough time between classes placed in the same room, if passing time is not already built into the start and finish time of classes.

If you have finish times that end in “5” (for example, 9:15) and you also use 25E, your Extra Finish Minutes should also end in “5” (05, 15, and so on).
Example: 10

SUM CROSS-LISTED ENROLLMENTS
If this parameter is set to “YES”, SCHEDULE25 internally adds the enrollment values of each Class Descriptor record in a group of classes coded as “cross-listed” prior to initiating the assignment algorithm. SCHEDULE25 then assigns a room that has a capacity equal to or greater than the sum of the enrollments of the cross-listed classes. If the parameter is set to “NO”, SCHEDULE25 assigns a room with a capacity equal to or greater than the enrollment of the NSM class. SCHEDULE25 expects the enrollment of each class in a cross-listed group to be the same.
Example: YES
Conflict deciders

A Conflict Decider is a user-defined weight given to a class that SCHEDULE25 uses to break a tie among classes with identical requirements vying for the same available room. “Identical requirements” means that two or more classes require the same size room with the same physical feature requirements in the same partition(s) at the same time on the same days of the week.

If a Conflict Decider is not used or is identical for all class records, SCHEDULE25 performs a “coin toss” to break a tie. If a meaningful Conflict Decider exists, the higher number “wins.”

For example, if the Control file defines column 7 of the Class Descriptor file as the conflict decider, and the following two class records have identical requirements and are tied for room placement, the record with the highest number in column 7 “wins” and is placed in the room. In this case the “5” in column 7 of the second record “beats” the “2” in column 7 of the first record:

ARC 48285A MWF 8:00 8:50 35 09/07 12/15 NSM
ARC 48570A MWF 8:00 8:50 35 09/07 12/15 NSM

Here are some examples of how colleges and universities have used conflict deciders to weight class placement:

- Classes sponsored by departments that have done a good job of distributing class offerings evenly across the clock receive a higher conflict decider than those sponsored by departments that offer most of their classes during “prime time.”

- Classes taught by senior faculty receive a higher conflict decider than classes taught by graduate teaching assistants.

- Credit classes receive a higher conflict decider than non-credit classes.

In fact, because a conflict decider can be up to five digits, you could create a number that indicates that a credit class taught by a senior faculty member who is from a department that distributes course offerings evenly has the highest conflict decider of all!

Generally, conflict deciders are best designed into the interface between your student information system and SCHEDULE25 to allow for their inclusion at the time the class data is extracted. However, you may also manually insert digits in the conflict decider columns by editing the Class Descriptor file (datain.dat) before running SCHEDULE25.
### Minimum permissible ratio enrollment/seats

The Minimum Permissible Ratio Enrollment/Seats ("fill ratio") parameter is a fraction that designates the minimum percentage of seats in a room that must be filled by any SCHEDULE25 room assignment.

<table>
<thead>
<tr>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequoia Community College decides to set the Minimum Permissible Ratio Enrollment/Seats parameter to 0.20 (20%) to ensure that SCHEDULE25 will place a class in a room only if the class fills at least 20% of the room’s seats.</td>
</tr>
</tbody>
</table>

If an individual room profile includes its own fill ratio specification (F record), the room’s fill ratio overrides the global fill ratio in the Control file.

The value of the minimum fill ratio does not affect preassignments. For example, you may preassign a class having only 20 students to a 100 seat room, even though the minimum fill ratio is set at 40%.

The decision to set a high fill ratio is usually made solely for the purpose of pushing for higher utilization after all classes have been successfully placed. Unless there is a specific policy at your campus which forbids the use of large rooms for small classes, we recommend that you do not set high fill ratios for your ordinary scheduling runs. Typically, the global fill ratio should be set no higher than 10%.

Make sure this parameter is not set to 0.00. If it is, SCHEDULE25 disregards enrollment entirely in assigning classes, except for rooms with individual fill ratios.
The Enrollment Adjuster specifies a percentage by which SCHEDULE25 is to adjust the enrollments in the Class Descriptor records prior to initiating the assignment algorithm. SCHEDULE25 does not change or overwrite the data in the Enrollment field; it uses the adjusted value internally during the room assignment process. To prevent SCHEDULE25 from making any adjustment, use 1.00 as the value for this parameter.

**Example**

Because exact enrollment figures are not available until immediately before the semester begins, Alder University must run SCHEDULE25 with estimated or maximum capacity enrollment figures. These figures are typically inflated by departments. To compensate for this, the scheduler sets the Enrollment Adjuster to .95 (95%), so SCHEDULE25 will consider the enrollment of each class to be five percent less than the value in the Enrollment field and assign rooms accordingly. A class of 100, then, might be assigned to a room that seats as few as 95.

**Example**

Lone Pine State College runs SCHEDULE25 with actual enrollment figures, but knows that additional students will enroll between the time the schedule is produced and classes begin. To anticipate this, the scheduler sets the Enrollment Adjuster to 1.05 (105%), so SCHEDULE25 will consider the enrollment of each class to be five percent higher than the value in the Enrollment field and assign rooms accordingly. A class of 100, then, could only be assigned to a room that seats at least 105.
The interaction of the fill ratio and the enrollment adjuster may produce unexpected placement results if you are not aware that they mutually affect room assignments. For example, the case below shows what happens when the fill ratio parameter is set to 0.60 (60%) and the enrollment adjuster parameter is set to 1.05 (105%).

**Interaction between the fill ratio and the enrollment adjuster**

The diagram illustrates the interaction between the fill ratio and the enrollment adjuster. A classroom with 100 seats has a fill ratio of 60% and an enrollment adjuster of 105%. Classes of 57-95 students would be placed in this room.

**Default Enrollment**

When SCHEDULE25 detects the character set representing the Default Enrollment Indicator in the Enrollment field, it searches for a room with at least the number of seats represented by the Default Enrollment. You can change the value of the Default Enrollment in the Control file to increase or decrease the size of rooms SCHEDULE25 will assign to classes with no enrollment.
The Minimum Correct Input Fraction specifies the minimum percentage of Class Descriptor records that must be correct before SCHEDULE25 will carry out its assignment function. If this parameter is set at 1.00 (100%), SCHEDULE25 halts on the first error it detects.

**Example**

Lilac Technical College is still testing and troubleshooting their class/section extract program and so is doing tests runs of SCHEDULE25 to flush out any errors in their Class Descriptor file. The testers set the Minimum Correct Input Fraction to 0.75 (75%) to increase the likelihood that more errors will be exposed without halting the SCHEDULE25 run.

When you are using SCHEDULE25 in production, all records should be correct before you accept the SCHEDULE25 assignments, since altering just one record could radically alter the assignment results.
Introduction

What's in this chapter
This chapter discusses how SCHEDULE25 “thinks”—the criteria its assignment algorithm uses to optimize scheduling, and the actual process it performs to validate input data and make classroom assignments. It includes:

- A description of the mathematical problem underlying classroom scheduling and how SCHEDULE25’s optimizing algorithm addresses that problem.
- An overview of how SCHEDULE25 validates input files and assigns rooms to classes.

Before you read this chapter
It is important that you have read chapters 2, 3, and 4 before reading this chapter for a thorough understanding of the SCHEDULE25 input files and how SCHEDULE25 uses the data in them.

Chapter contents

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</table>
The assignment algorithm

What makes SCHEDULE25 unique

SCHEDULE25 is the only system whose internal algorithm effectively addresses the optimization issue underlying classroom scheduling. Other systems, which use priority sequencing, right-to-schedule schemes, preorderings, and so on, unduly politicize the classroom scheduling function because they confer artificial and unnecessary placement advantage on those classes at the “top” of the list. In such systems, departments are forced to compete with each other for space.

The mathematical problem

Ironically, the objective of maximizing the number of classes placed and thus minimizing the need for requiring section time changes, haggling with departments, and so on, is in no way served by the implicit or explicit ordering of sections during the assignment process. Any ranking, preordering, or right-to-schedule scheme is, in fact, mathematically irrelevant to minimizing unplaced classes.

The odds against optimizing the number of classes placed with preordering schemes and systems is immense. For example, the number below is the total number of possible classroom schedules for a small campus with 50 rooms and 500 classes:

3,054,936,363,499,604,682,051,979,393,213,617,699,789, 402,740,572,326,663,893,613,909,281,291,626,524,720,457, 701,857,235,108,015,228,256,875,152,693,590,467,155,317, 853,427,804,283,969,735,133,114,200,917,889,639,725,420, 533,772,852,222,035,588,819,531,883,700,816,508,667,930, 179,487,913,773,389,937,052,516,364,978,922,702,120,035, 245,082,091,219,087,448,202,119,601,494,637,211,093,403, 079,855,076,782,836,518,362,040,933,993,739,599,827,677, 011,489,868,164,062,500,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000, 000,000,000,000,000,000,000,000,000,000,000,000,000,000,
Since the total number of preorderings is enormous, and since selecting a preordering scheme bears no direct relationship to arriving at an optimized classroom schedule, testing various preordering schemes is tantamount to picking numbers from a hat.

SCHEDULE25 works because it completely discards the preorderings, sortings, and other prearrangements of data that have no bearing on achieving optimization objectives. By discarding preordering schemes, SCHEDULE25 discards the need to confer advantage during the classroom assignment process. As a SCHEDULE25 user, you don’t have to be concerned about whom to assign first, and departments don’t have to compete among themselves for this critical advantage.

As a SCHEDULE25 user, you only need to be concerned with accurately describing for each class and each department their physical characteristic requirements and location preferences, no matter how generous or restrictive these requirements and preferences might be or how they might overlap with those of other classes or departments.

Working entirely within these requirements and preferences, SCHEDULE25 applies a highly advanced, powerful algorithm that aims for optimization in three areas. These are:

1. Maximization of the number of classes placed
2. Maximization of departmental location preferences
3. Maximization of average utilization (head count per 100 seats)

SCHEDULE25 does not change the class data itself to optimize the matching of classes to classrooms. It does not, for example, alter class meeting times to better allow classes to be assigned. SCHEDULE25 operates strictly within the requirements fed to it, seeking the best possible conflict-free schedule for the classes and classrooms described.
Processing overview

SCHEDULE25 processes input information and makes room assignments as described below and illustrated on the next page:

1. It validates the syntax (format) of the Campus Profile files in this order:
   • Physical Features file (phys.dat)
   • Campus Partitions file (part.dat)
   • Control file (ctrl.dat)
   • Room/Space file (rooms.dat)
   • Department/Sponsor file (depts.dat)

   If it encounters record errors in this validation process, it halts the run and generates the appropriate diagnostic messages for the error conditions encountered in the file.

2. It validates the Class Descriptor file and generates diagnostic messages for any error conditions.

3. If it encounters no errors, it initiates the assignment algorithm.

   If it encounters errors, it checks the “Minimum Correct Input Fraction” parameter in the Control file. If the percentage of correct records in the Class Descriptor file is greater than or equal to the parameter percentage, it initiates the assignment algorithm. If not, it halts the run.

4. The assignment algorithm checks preassigned records for proper record sequencing and conflicts, assigns correct records to their requested rooms, and generates error messages for incorrect records.

5. The assignment algorithm assigns unassigned classes by:
   • Scanning the department K records for a match to the department key on the Class Descriptor record.
   • If it finds a match, considering profiled rooms that match the department location preferences and physical feature requirements as potential candidates for assignment.
   OR
     • If it doesn’t find a match, considering all profiled rooms as potential candidates for assignment.
   • Assigning rooms based on class size, meeting time, date span (and partition preferences and physical feature requirements if specified for a class).

6. It generates reports and output data files.
SCHEDULE25 Processing

Validates Campus Profile files

Errors?

yes

Halts run

no

Validates Class Descriptor file

Errors?

yes

Generates Class Descriptor file diagnostic message(s)

no

Compares % correct records in Class Descriptor to min. correct input fraction

\( \geq \) fraction?

yes

Halts run

no

Processes preassigned classes

Processes unassigned classes

Generates reports and output data files
5 SCHEDULE25 Processing
**Introduction**

**What's in this chapter**

At the end of each run, SCHEDULE25 automatically generates a series of reports and output data files. This chapter describes and shows samples of each of the reports and describes each of the output data files.

For more information, see:

- Chapter 8, *Scheduling Classes*, for instructions on browsing and printing reports and suggestions for analyzing and using the reports described in this chapter.

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</tr>
<tr>
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<td>6-14</td>
</tr>
</tbody>
</table>
**SCHEDULE25 reports overview**

The following reports are automatically generated as part of the SCHEDULE25 run.

<table>
<thead>
<tr>
<th>This report...</th>
<th>Provides...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Placement Analysis <em>(summary.rpt)</em></td>
<td>A summary of the performance of SCHEDULE25’s most recent run. It includes quantitative information about the number of preassignments, the number of requests, the number of classes successfully placed, the number of classes impossible to place, and the number of classes not placed. It also includes the number and percentage of classes placed in departments’ first through fourth location preferences.</td>
</tr>
<tr>
<td>Diagnostics for erroneously prepared records <em>(diag.rpt)</em></td>
<td>All diagnostic messages for errors encountered in any input file during the SCHEDULE25 run with their associated problem records.</td>
</tr>
<tr>
<td>Listing of classes placed (by room) <em>(sortrm.rpt)</em></td>
<td>A list of all room assignments, whether preassigned or assigned by SCHEDULE25, sorted by room.</td>
</tr>
<tr>
<td>Listing of classes placed (by department) <em>(sortdp.rpt)</em></td>
<td>A list of all room assignments, whether preassigned or assigned by SCHEDULE25, sorted by department.</td>
</tr>
<tr>
<td>Listing of classes impossible to place <em>(notposs.rpt)</em></td>
<td>A list of all classes for which there is no appropriate space in your room inventory.</td>
</tr>
<tr>
<td>Listing of classes that could not be placed <em>(losers.rpt)</em></td>
<td>A list of all classes that were not placed due to competition for the same kind of space on the same days and times.</td>
</tr>
<tr>
<td>Listing of open rooms (by day of week and time) <em>(avail.rpt)</em></td>
<td>A list of rooms, by day and time block, that remain available after the SCHEDULE25 run.</td>
</tr>
</tbody>
</table>
Placement Analysis

Report description

The Placement Analysis report (summary.rpt) provides summary information about the results of the most recent SCHEDULE25 run.

Report sample

Below is a sample of the Placement Analysis report. The information provided by the report is described beginning on the next page. The report format is wide, so if you can’t see the whole report online, you may want to print it (instructions on page 8-9).
### Report information

The Placement Analysis report provides the following information:

<table>
<thead>
<tr>
<th>Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total record sets read</td>
<td>The total number and percent of Class Descriptor record sets read. A “record set” is an M record and its associated P and/or L records.</td>
</tr>
<tr>
<td>Total correctly prepared</td>
<td>The total number and percent of Class Descriptor records with no errors.</td>
</tr>
<tr>
<td>Total incorrectly prepared</td>
<td>The total number and percent of Class Descriptor records with errors.</td>
</tr>
<tr>
<td>Preassignments</td>
<td>The total number and percent of HSM, VSM, ASM, 5SM, 5XM, and AXM records in the Class Descriptor file.</td>
</tr>
<tr>
<td>Room requests</td>
<td>The total number and percent of NSM, 1SM, RSM, NXM, 1XM, RXM, and WSM records in the Class Descriptor file.</td>
</tr>
<tr>
<td>Conflicting</td>
<td>The total number and percent of conflicting preassignments.</td>
</tr>
<tr>
<td>Conflict-free</td>
<td>The total number and percent of non-conflicting preassignments.</td>
</tr>
<tr>
<td>Possible-to-fill</td>
<td>Prior to the SCHEDULE25 assignment process, the total number and percent of room requests for which there was at least one room in the rooms.dat file that could properly accommodate the request.</td>
</tr>
<tr>
<td>Impossible-to-fill</td>
<td>Prior to the SCHEDULE25 assignment process, the total number and percent of room requests for which there was no room in the rooms.dat file that could properly accommodate the request.</td>
</tr>
<tr>
<td>Placed</td>
<td>The total number and percent of room requests placed by SCHEDULE25.</td>
</tr>
<tr>
<td>Not-placed</td>
<td>The total number and percent of room requests not placed by SCHEDULE25. This count is different than the Impossible To Fill category, because prior to the start of the SCHEDULE25 assignment process, all requests in this category had at least one room in the rooms.dat file that would have properly accommodated the request. These are the “losers” due to competition for rooms.</td>
</tr>
<tr>
<td>Priority 1 - Priority 4</td>
<td>These categories correspond to the four location preference levels defined by C records in the depts.dat file. Priority1 tells the number and percent of classes that were placed by SCHEDULE25 into departments’ most preferred partitions; Priority2 tells the number and percent of classes that were placed into departments’ second most preferred partitions, and so on. The more classes/higher percentage of classes placed in the higher priority categories (Priority1, Priority2), the better SCHEDULE25 has done in satisfying department location preferences.</td>
</tr>
<tr>
<td>Average Utilization</td>
<td>The average seat utilization (average fill of students per number of seats) for assignments made by SCHEDULE25.</td>
</tr>
</tbody>
</table>
Diagnostics For Erroneously Prepared Records

Report description
The Diagnostics For Erroneously Prepared Records report (diag.rpt) provides diagnostic messages for incorrectly prepared input records and includes the Campus Profile or Class Descriptor record(s) that caused the error condition.

Report sample
Below is a sample of the Diagnostics For Erroneously Prepared Records report.

The report lists the incorrectly prepared record(s) and their associated diagnostic message(s). See Chapter 9, Diagnostic Messages, for information about what each of the SCHEDULE25 diagnostic messages means and how to correct the errors reported.
Listing of Classes Placed (by room)

Report description

The Listing of Classes Placed (by room) report (sortrm.rpt) lists all classes that were preassigned or scheduled by SCHEDULE25, sorted by room.

Report sample

Below is a sample of a portion of the Listing of Classes Placed (By Room) report.

----MFS: 1,3,4,5,12,16,17,19,27,28,31---------------------------------------------
----ROOMSIZE: 130---------------------------------------------------------------
MIN FILL RATIO: 0,65---------------------------------------------------------MM 103----------------

<table>
<thead>
<tr>
<th>COURSE</th>
<th>ROOM</th>
<th>TIME</th>
<th>DAY</th>
<th>START</th>
<th>END</th>
<th>STATUS</th>
<th>STAFF</th>
<th>TIME</th>
<th>RM</th>
<th>RATING</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHY 09117</td>
<td>MWF</td>
<td>1230</td>
<td>1320</td>
<td>H</td>
<td>115</td>
<td>FA</td>
<td>09/06</td>
<td>12/20</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>CPY 09117</td>
<td>TR</td>
<td>1330</td>
<td>1430</td>
<td>H</td>
<td>98</td>
<td>FA</td>
<td>09/10</td>
<td>12/19</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>DES 54100A</td>
<td>MWF</td>
<td>1330</td>
<td>1430</td>
<td>H</td>
<td>98</td>
<td>FA</td>
<td>09/09</td>
<td>12/18</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>MEC 241411</td>
<td>MWF</td>
<td>0930</td>
<td>1030</td>
<td>H</td>
<td>120</td>
<td>FA</td>
<td>09/06</td>
<td>12/20</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>PHY 531221</td>
<td>MWF</td>
<td>1830</td>
<td>1930</td>
<td>H</td>
<td>98</td>
<td>FA</td>
<td>09/09</td>
<td>12/18</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>CS 15121</td>
<td>MWF</td>
<td>1530</td>
<td>1630</td>
<td>H</td>
<td>125</td>
<td>FA</td>
<td>09/09</td>
<td>12/18</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>CS 151231</td>
<td>TR</td>
<td>1330</td>
<td>1430</td>
<td>H</td>
<td>100</td>
<td>FA</td>
<td>09/10</td>
<td>12/19</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>ARC 48100A</td>
<td>T</td>
<td>1500</td>
<td>1620</td>
<td>H</td>
<td>65</td>
<td>FA</td>
<td>09/09</td>
<td>12/17</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>DRA 542811</td>
<td>T</td>
<td>1500</td>
<td>1620</td>
<td>H</td>
<td>65</td>
<td>FA</td>
<td>09/09</td>
<td>12/17</td>
<td>MM</td>
<td>103</td>
</tr>
<tr>
<td>DRA 543811</td>
<td>T</td>
<td>1500</td>
<td>1620</td>
<td>H</td>
<td>65</td>
<td>FA</td>
<td>09/09</td>
<td>12/17</td>
<td>MM</td>
<td>103</td>
</tr>
</tbody>
</table>
Report information

- The report lists the Class Descriptor records grouped by assigned room.
- Physical characteristics, seating capacity, minimum fill ratio, and room name are included in the header information for each room.
- Rooms are listed in the order they appear in the rooms.dat file.
- The format of the Class Descriptor records reported is identical to the Class Descriptor input file (datain.dat) as defined in the Control file.
Listing of Classes Placed (by department)

Report description

The Listing of Classes Placed (by department) report (sortdp.rpt) lists all classes that were preassigned or scheduled by SCHEDULE25, sorted by department.

Report sample

Below is a sample of a portion of the Listing of Classes Placed (By Dept) report.

Report information

- The report lists the Class Descriptor records grouped by department.
- Departments are listed in the order they appear in the depts.dat file.
- The format of the Class Descriptor records reported is identical to the Class Descriptor input file (datain.dat) as defined in the Control file.
Listing of Classes Impossible to Place

Report description

The Listing of Classes Impossible To Place report (`notposs.rpt`) provides a list of all classes that SCHEDULE25 found impossible to place prior to the scheduling process because of the conditions of the request.

Report sample

Below is a sample of the Listing of Classes Impossible To Place report.

```
<table>
<thead>
<tr>
<th>COURSE</th>
<th>DAYS</th>
<th>TIME</th>
<th>START</th>
<th>END</th>
<th>DAY</th>
<th>ROOM</th>
<th>INSTRUCTOR</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 1890A</td>
<td>TR</td>
<td>1530</td>
<td>1650H</td>
<td>106</td>
<td>FA</td>
<td>09/10</td>
<td>12/19</td>
<td>DH</td>
</tr>
<tr>
<td>ECE 1890A</td>
<td>TR</td>
<td>1530</td>
<td>1650H</td>
<td>106</td>
<td>FA</td>
<td>09/10</td>
<td>12/19</td>
<td>DH</td>
</tr>
<tr>
<td>ECE 1890A</td>
<td>TR</td>
<td>1530</td>
<td>1650H</td>
<td>106</td>
<td>FA</td>
<td>09/10</td>
<td>12/19</td>
<td>DH</td>
</tr>
</tbody>
</table>
```

LISTING OF CLASSES IMPOSSIBLE TO PLACE
The report lists all impossible to place Class Descriptor records, but doesn’t tell you why the classes were impossible to place.

A record appears on this report because prior to the initiation of the assignment algorithm not even one room in the rooms.dat file would meet the class requirements as defined in the record. SCHEDULE25 saw the request as illogical for some reason.

Examples:

- If a Math class has an enrollment of 135 and requires 40 feet of blackboard and wheelchair access, and no such room exists in the partitions specified in the Math department profile, the class is impossible to place.

- If the only room(s) that would meet the criteria of a class have been preassigned to other classes, SCHEDULE25 no longer sees those rooms in its “inventory”; it is as if no such room exists. This makes the class impossible to place.

- If only one room meets the criteria of a class, but the class enrollment does not meet the global or room fill ratio, the class is impossible to place.

The format of the Class Descriptor records reported is identical to the Class Descriptor input file (datain.dat) as defined in the Control file.
Listing of Classes That Could Not Be Placed

Report description

The Listing of Classes That Could Not Be Placed report (losers.rpt) provides a list of all classes that were not placed by SCHEDULE25 in the scheduling process. Because the name of the file is losers.rpt, these classes are often referred to as “losers”.

Report sample

Below is a sample of the Listing of Classes That Could Not Be Placed report.

Report information

- Unlike the impossible to place records, prior to the initiation of the assignment algorithm at least one room in the rooms.dat file met the class requirements as defined in each of these records. “Losers” are not placed due to competition for space. A lower conflict decider, a SCHEDULE25 “coin toss”, or other classes being placed to yield a better overall scheduling solution prevented these classes from being placed.

- The format of the Class Descriptor records reported is identical to the Class Descriptor input file (datain.dat) as defined in the Control file.
Listing of Open Rooms (by day of week and time)

Report description
The Listing of Open Rooms (By Day of Week and Time) report (avail.rpt) lists, for each time block, the rooms that remain open after the SCHEDULE25 scheduling process is run.

Report sample
Below is a sample of a portion of the Listing of Open Rooms (by Day of Week and Time) report.

```
MONDAY

<table>
<thead>
<tr>
<th>Time</th>
<th>Room Code</th>
<th>Room Name</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800</td>
<td>103 SH</td>
<td>125 BB</td>
<td>206 SH</td>
</tr>
<tr>
<td>0824</td>
<td>8427 SH</td>
<td>324 SH</td>
<td>422 BHH</td>
</tr>
<tr>
<td>0850</td>
<td>1000 BBH</td>
<td>1002 BBH</td>
<td>1003 BBH</td>
</tr>
<tr>
<td>0924</td>
<td>1124 BBH</td>
<td>2224 WWH</td>
<td>2244 WWH</td>
</tr>
<tr>
<td>0940</td>
<td>2505 WWH</td>
<td>5025 WWH</td>
<td>5403 WPH</td>
</tr>
<tr>
<td>1000</td>
<td>5427 WPH</td>
<td>6423 WPH</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
<th>Room Code</th>
<th>Room Name</th>
<th>Occupancy</th>
</tr>
</thead>
<tbody>
<tr>
<td>0900</td>
<td>103 SH</td>
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<td>206 SH</td>
</tr>
<tr>
<td>0924</td>
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<tr>
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<td>1124 BBH</td>
<td>2224 WWH</td>
<td>2244 WWH</td>
</tr>
<tr>
<td>1040</td>
<td>2505 WWH</td>
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</tr>
<tr>
<td>1100</td>
<td>5427 WPH</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
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</tr>
</thead>
<tbody>
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<td>0930</td>
<td>103 SH</td>
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<td>324 SH</td>
<td>422 BHH</td>
</tr>
<tr>
<td>1024</td>
<td>1000 BBH</td>
<td>1002 BBH</td>
<td>1003 BBH</td>
</tr>
<tr>
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<td>0950</td>
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</tr>
<tr>
<td>1144</td>
<td>5427 WPH</td>
<td>6423 WPH</td>
<td></td>
</tr>
</tbody>
</table>
```

The time blocks reported are determined from the start times in the Class Descriptor file. A room is listed as open in a given time block only if it is open for that timeblock throughout all weeks of the term or semester.

If you have 25E, we recommend that instead of using this report you load schedule data from SCHEDULE25 into 25E and look for available rooms online or via the 25E Class Matrix report.
SCHEDULE25 output data files

The following output data files are automatically generated as part of the SCHEDULE25 run. Five of the seven files correspond to report files described earlier in this chapter.

<table>
<thead>
<tr>
<th>This file...</th>
<th>Provides...</th>
</tr>
</thead>
<tbody>
<tr>
<td>summary.dat</td>
<td>The performance summary data from the most recent SCHEDULE25 run. It corresponds to the summary.rpt report file (see page 6-3).</td>
</tr>
<tr>
<td>errors.dat</td>
<td>A list of the incorrectly formatted Class Descriptor file records.</td>
</tr>
<tr>
<td>sortrm.dat</td>
<td>A list of the Class Descriptor records of classes that were preassigned or assigned by SCHEDULE25, sorted by room. It corresponds to the sortrm.rpt report file (see page 6-6). This file can be edited and used as input when rerunning SCHEDULE25 (see page 8-17).</td>
</tr>
<tr>
<td>sortrm.pl</td>
<td>A list of the Class Descriptor records of classes that were preassigned or assigned by SCHEDULE25, sorted by room. It includes all P (physical features requirements) and L (location preference) records associated with those Class Descriptor records. This is the recommended file for loading SCHEDULE25 results into 25E (see Appendix A).</td>
</tr>
<tr>
<td>sortdp.dat</td>
<td>A list of the Class Descriptor records of classes that were preassigned or assigned by SCHEDULE25, sorted by department. It corresponds to the sortdp.rpt report file (see page 6-8).</td>
</tr>
<tr>
<td>notposs.dat</td>
<td>A list of the Class Descriptor records of classes that were impossible to place due to the nature of the request or where all possibilities were blocked by preassignments. It corresponds to the notposs.rpt report file (see page 6-9).</td>
</tr>
<tr>
<td>losers.dat</td>
<td>A list of the Class Descriptor records of classes that could not be placed due to competing requests for the same kind of room on the same days and times. It corresponds to the losers.rpt report file (see page 6-11).</td>
</tr>
</tbody>
</table>
Using SCHEDULE25
Preparing To Schedule Classes

Introduction

What’s in this chapter

This chapter tells how to prepare for a SCHEDULE25 run. It includes:

- An overview of the preparation steps
- Guidance in how to verify each of the SCHEDULE25 input files

Chapter contents

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview of the preparation steps</td>
<td>7-2</td>
</tr>
<tr>
<td>Verifying the course master information</td>
<td>7-4</td>
</tr>
<tr>
<td>Running the class/section extract program</td>
<td>7-5</td>
</tr>
<tr>
<td>Verifying the Class Descriptor file</td>
<td>7-6</td>
</tr>
<tr>
<td>Verifying Campus Profile files</td>
<td>7-7</td>
</tr>
<tr>
<td>Verifying the Control file</td>
<td>7-10</td>
</tr>
</tbody>
</table>
Overview of the preparation steps

Steps

To prepare to run SCHEDULE25, follow these steps:

1. Review the course master or class section file records for the semester/term you’re scheduling.
2. Run your institution’s class/section extract program or request that it be run.
3. Verify the accuracy and completeness of the Class Descriptor file.
4. Verify the accuracy and completeness of the Campus Profile files.
5. Ensure that the performance parameters in the Control file are set properly.

When you have completed these steps, you’re ready to run SCHEDULE25.
You may find that in your first year of using SCHEDULE25, these steps require considerable attention and time on your part. After that, as you iron out any wrinkles in your scheduling process and as the content of the input files stabilizes over the school year, much less time will be required, and preparing to run and running SCHEDULE25 will become a comfortable, efficient routine part of your overall scheduling process.
Verifying the course master information

Introduction
The first step in preparing to run SCHEDULE25 is to verify the class meeting information in your student information system. This ensures that the data extracted from this file by your class/section extract program will be accurate and complete.

What to check
When checking the course master or class section file, make sure that your institution’s scheduling policies have been adhered to by verifying that:

- All cross-listed classes are accurately designated, including identifying the course IDs of all classes in each set.
- All classes with preassigned rooms are legitimately preassigned. It is best to keep preassignments to a minimum, since they can constrain SCHEDULE25’s optimizing capabilities.
- Requests for multiple classes to be assigned to the same room are identified and valid.
- Specific physical feature and equipment requirements are identified and valid.
- Location/partition preferences are identified and valid.
- Enrollments or estimated enrollments are appropriate.
- Day, time, and date information is complete and correct.
Running the class/section extract program

The second step in preparing to run SCHEDULE25 is to run the class/section extract program that has been developed by your institution. At some institutions, the scheduler runs this program. At others, the scheduler must request that this program be run by computer services.

The class/section extract program selects class data from your institution’s course master or class section file and generates a valid SCHEDULE25 Class Descriptor file.

During the planning and implementation phase of your SCHEDULE25 project, your project team identified the data elements that must be extracted from each class meeting record, which classes should be extracted, and the format of the Class Descriptor records.
Verifying the Class Descriptor file

Introduction

The third step in preparing to run SCHEDULE25 is to verify the accuracy and completeness of the Class Descriptor file (*datain.dat*) which results from running the class/section extract program. A description and example of the file begin on page 3-2.

What to check

To verify the Class Descriptor file, make sure that:

- All preassignments are coded correctly (records with these assignment codes: ASM, AXM, HSM/VSM, and possibly 5SM, 5SM/WSM, 5XM).

- Cross-listed, “back-to-back”, and double-booked classes are coded correctly (records with assignment codes: AXM, HSM/ VSM, NSM/RSM, NSM/WSM, 1SM/WSM, 1SM/RSM, NXM/RXM, and 1XM/RXM).

- All physical feature requirements are valid (P records).

- All location preferences are valid (L records).

- All preferred (1SM) or preassigned room names are SCHEDULE25 profiled rooms (that is, they are all in the *rooms.dat* file).

- All classes that are preassigned to SCHEDULE25 profiled rooms are included. Omitting a class that is preassigned to a SCHEDULE25 room allows SCHEDULE25 to make other assignments to that room during the class meeting times.

- The data columns are aligned correctly.

- No required data is missing.

- The record order is correct:

<table>
<thead>
<tr>
<th>Records with this assignment code...</th>
<th>Must follow records with this assignment code...</th>
</tr>
</thead>
<tbody>
<tr>
<td>WSM</td>
<td>NSM, 1SM, or 5SM</td>
</tr>
<tr>
<td>RSM</td>
<td>NSM or 1SM</td>
</tr>
<tr>
<td>RXM</td>
<td>NXM or 1XM</td>
</tr>
</tbody>
</table>
Verifying Campus Profile files

Introduction

The fourth step in preparing to run SCHEDULE25 is to verify the information in all the Campus Profile files, except the Control file. Your job is to ensure that each of these files contains all the data you think should be there for the semester/term you’re scheduling. SCHEDULE25 will verify the format and syntax of these files during the run.

You may or may not have authorization to edit these files. If not, make sure that all changes are included and reviewed by you before running SCHEDULE25.

The Campus Profile files (excluding the Control file) are:

<table>
<thead>
<tr>
<th>File</th>
<th>see page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Features (phys.dat)</td>
<td>7-7</td>
</tr>
<tr>
<td>Campus Partitions (part.dat)</td>
<td>7-8</td>
</tr>
<tr>
<td>Departments (depts.dat)</td>
<td>7-8</td>
</tr>
<tr>
<td>Rooms (rooms.dat)</td>
<td>7-9</td>
</tr>
</tbody>
</table>

Descriptions and samples of these files begin on page 2-2.

Verification of the Control file, which is also one of the Campus Profile files, is the fifth step in preparing to run SCHEDULE25, and is described beginning on page 7-10.

Verifying the Physical Features file

To verify the Physical Features file (phys.dat), make sure:

- All new equipment available in rooms has been added.
- Features no longer required have been deleted.
- Any changes you make to this file are reflected in the rooms.dat and depts.dat files, as well as in any lists, screens, or other references used to indicate physical features for individual classes.
Verifying the Campus Partitions file

To verify the Campus Partitions file (*part.dat*), make sure:

- It reflects the current division of campus space as determined by department preferences.
- Any new partitions have been added.
- Any partitions that are temporarily unused but will be used again in the future remain in the file.
- Any partitions that are permanently gone (for example, the building was torn down) have been deleted or renamed to indicate that they are unused.
- Any changes you make to this file are reflected in the *rooms.dat* and *depts.dat* files, as well as in any lists, screens, or other references used to indicate partition preferences for individual classes.

Verifying the Departments file

To verify the Departments file (*depts.dat*), make sure:

- The file includes profiles for all departments that will be valid in the term/semester you’re scheduling.
- The numbers assigned to the department profiles are in sequential order, especially if you have removed department profiles. If, for example, you remove profile ‘015’, you must close the sequence number gap by either renumbering all profiles from position ‘016’ to the end of the file or by replacing ‘015’ with the last profile in the file and renumbering it to ‘015’.
- You only add new profiles to the end of the file, since adding a profile to the middle will necessitate renumbering all profiles which follow.
- Any changes you made to the Physical Features file (*phys.dat*) or the Campus Partitions file (*part.dat*) are reflected in the appropriate department profiles.
Verifying the Rooms file

To verify the Rooms file (*rooms.dat*), make sure:

- All rooms available to SCHEDULE25 are included.
- All rooms to which classes in the Class Descriptor file are preassigned are included.
- Blackout records represent current space management and scheduling practices.
- The room inventory is up-to-date regarding physical features.
- Current room capacity is accurately reflected.
- Each room’s indicated partition is correct.
- Fill ratio, if something other than the global fill ratio set in the Control file, is included as an F record in the room’s profile.

If you are using the same Campus Profile files for 25E, it is particularly critical that physical feature, partition, and room additions, changes, and deletions have been made. In addition, department profiles may not be reordered once a calendar year is initialized. If you are using the same *depts.dat* file for SCHEDULE25 and 25E, do not renumber profiles until you are ready to initialize a new year for 25E.
Verifying the Control file

Introduction

The fifth step in preparing to run SCHEDULE25 is to verify that the parameters in the Control file (ctrl.dat) are set correctly and that the file is complete and correct. (See the file sample on page 4-3.)

To verify the Control file, make sure:

- The parameters are set as you want them to be for this run.
- All records are present and in the proper order, and that the record description and record number are verbatim.

Suggestions for setting performance parameters

When reviewing the Control file performance parameters, consider these suggestions:

- Set the Minimum Permissible Ratio Enrollment/Seats parameter low for the first SCHEDULE25 run of the term or semester. Gradually increase the parameter value for subsequent runs until utilization or the number of placements or department preferences is degraded. This practice will push for better and better space utilization.

- Set the Enrollment Adjuster parameter to a value less than 1.00 (100%) if the class sizes in the Class Descriptor records are estimates that are likely to be too high.

- Set the Enrollment Adjuster parameter to a value greater than 1.00 if you want to make sure that at least a few seats remain open following the SCHEDULE25 scheduling process.

- To prevent SCHEDULE25 from making any adjustment in enrollment, set the Enrollment Adjuster to 1.00.

- When you are running SCHEDULE25, consider setting the Minimum Correct Input Fraction parameter to .85 -.90 (85%-90%) to flush out as many Class Descriptor file errors during each SCHEDULE25 run as possible. If the parameter is set to 1.00, even one error will stop the run.

- Set the Number of Weeks in Term parameter before the beginning of the academic year for the highest number of weeks in any term or semester of that year. This parameter does not have to be changed during the year.
Scheduling Classes

Introduction

What's in this chapter

This chapter tells how to perform the entire scheduling procedure. It includes:

- An overview of the scheduling steps
- Run instructions
- Report browse and print instructions
- Information on how to analyze and use SCHEDULE25 report output
- Guidance in determining when to rerun SCHEDULE25
- Information about running the room assignment update program
<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overview of the scheduling steps</td>
<td>8-3</td>
</tr>
<tr>
<td>Running SCHEDULE25</td>
<td>8-6</td>
</tr>
<tr>
<td>Browsing and printing SCHEDULE25 reports</td>
<td>8-8</td>
</tr>
<tr>
<td>Using the Diagnostics For Erroneously Prepared Records</td>
<td>8-10</td>
</tr>
<tr>
<td>report</td>
<td></td>
</tr>
<tr>
<td>Using the Placement Analysis report</td>
<td>8-11</td>
</tr>
<tr>
<td>Using the Listing of Classes Impossible To Place report</td>
<td>8-13</td>
</tr>
<tr>
<td>Using the Listing of Classes That Could Not Be Placed report</td>
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</tr>
<tr>
<td>Using the Listing of Classes Placed (by room) report</td>
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</tr>
<tr>
<td>Using the Listing of Classes Placed (by department) report</td>
<td>8-20</td>
</tr>
<tr>
<td>Using the Listing of Open rooms (by day of week/time) report</td>
<td>8-22</td>
</tr>
<tr>
<td>Running the room assignment update program</td>
<td>8-23</td>
</tr>
</tbody>
</table>
Overview of the scheduling steps

To run SCHEDULE25, analyze output, and update your course master, follow the steps below and on the next page. This procedure is illustrated on page 8-5, and each step is described in detail in the remainder of this chapter.

Be aware that each time you run SCHEDULE25 (unless you are using MODEL25), you write over the results of the previous run, unless you rename the output files after each run. Also, each run may produce slightly different room assignments.

1. After you have verified all input files, run SCHEDULE25.

2. Check the information on the processing screen.

3. If syntax errors were detected in a Campus Profile file (that is, the file the run stopped on):
   - View or print the Diagnostics For Erroneously Prepared Records report (diag.rpt) to find out what the errors were.
   - Check the Diagnostic Messages chapter of this manual for information on how to correct the errors.
   - Correct the errors and rerun SCHEDULE25.

4. If errors were detected in the Class Descriptor file:
   - View or print the Diagnostics For Erroneously Prepared Records report (diag.rpt) to find out what the errors were.
   - Check the Diagnostic Messages chapter of this manual for information on how to correct the errors.
   - Correct your course master file and/or your class/section extract program.
   - Rerun the class/section extract program.
   - Rerun SCHEDULE25.

5. View or print the Placement Analysis report (summary.rpt) to see a summary of the run. Analyze the report output to determine what to do next.
6. If there are impossible to place classes, you can:
   • View or print the Listing of Classes Impossible To Place report (notposs.rpt) to see the list of the impossible to place classes.
   • Determine why the classes were impossible to place.
   • Modify the course master records for these classes and any applicable Campus Profile files.
   • Rerun the class/section extract program.
   • Rerun SCHEDULE25.

7. If there are classes that could not be placed (“losers”), you can view or print the Listing Of Classes That Could Not Be Placed report (losers.rpt) to see a list of those classes.

8. View or print one or both of the Listing of Classes Placed reports (sortrm.rpt, sortdp.rpt), and analyze the report output.

9. If you are satisfied with the room assignments, continue to step 10.
   If you are not satisfied with the room assignments, you may want to modify Campus Profile files and/or the Control file, possibly edit records in one of the SCHEDULE25 output files, and rerun SCHEDULE25. This procedure is described in detail on page 8-17.

10. If you are not using 25E:
   • Run your institution’s room assignment update program.
   • Assign rooms manually in your course master file for any remaining impossible to place classes or “losers”.

11. If you are using 25E:
   • If you have any remaining impossible to place classes, load the notposs.dat output file into a 25E hold group for manual assignment.
   • If you had “losers”, load the losers.dat output file into a 25E hold group for manual assignment.
   • Load the sortrm.dat or sortrm.pl output file into 25E.
   • Run your institution’s room assignment update program.
Overview of the scheduling steps

Scheduling Procedure

Run SCHEDULE25

Campus Profile error(s)?
  yes → Review Diagnostics report → Correct Campus Profile file
  no

Class Descriptor error(s)?
  yes → Review Diagnostics report → Correct course master data and/or extract program → Rerun extract program
  no

Review Placement Analysis report and other report output as appropriate

Impossibles?
  yes → Modify Campus Profile files and/or course master data
  no

Satisfied with assignments?
  yes
  no → Modify Campus Profile and/or Control files → Edit output records

Using 25E?
  yes
  no

Losers?
  yes → Load losers.dat into 25E hold group for manual assignment
  no → Load sortrm.dat or sortrm.pl into 25E

Run room assignment update program
Manually place “losers” if applicable

SCHEDULE25 User’s Guide  8-5
Running SCHEDULE25

Run instructions  After you have verified that the input data is correct and complete, follow these instructions to run SCHEDULE25.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action or Command</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Login as the SCHEDULE25 OWNER.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>At the system prompt, type:</td>
<td>You see the SCHEDULE25 menu screen.</td>
</tr>
<tr>
<td></td>
<td>• S25 if you are in a UNIX environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• @runs25 if you are in a VMS environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Note: You might need to be in the sched25 directory when you type this command. Check with your technical support staff.</em></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Press &lt;1&gt; or &lt;Return&gt; or &lt;Enter&gt;.</td>
<td>You will see a message prompting you to start the SCHEDULE25 run.</td>
</tr>
<tr>
<td>4</td>
<td>Press &lt;Return&gt; or &lt;Enter&gt;. (Press &lt;Ctrl-c&gt; if you decide to cancel.)</td>
<td>You see the SCHEDULE25 processing screen which shows you the progress of the run:</td>
</tr>
<tr>
<td></td>
<td>The run usually takes 3 - 120 seconds.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Review the information on the processing screen (see next page).</td>
<td></td>
</tr>
</tbody>
</table>
The SCHEDULE25 processing screen, shown below, provides information on the progress and outcome of the SCHEDULE25 run.

### File verification progress
Number in brackets is record number of last record read before end of file or halt for error condition.

### Scheduling progress
Final number is total number of classes placed.

### Report generation

### Run time and errors/warnings
To see error/warning messages, browse or print the Diagnostics report.

### If the run halts because of a file error
If processing halts and the processing screen reports errors in any of the Campus Profile files or the Class Descriptor file:

- View or print the Diagnostics For Erroneously Prepared Records report to find out what file contains the errors and what the errors are. (Report browse and print instructions are on page 8-8.)
- Follow the instructions on page 8-10.
## Browsing and printing SCHEDULE25 reports

**Browse instructions**
After you have run SCHEDULE25, follow these instructions if you want to view report output online.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action or Command</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the SCHEDULE25 menu screen (shown below), press &lt;2&gt;.</td>
<td>You see the Browse Options screen shown here.</td>
</tr>
<tr>
<td>2</td>
<td>Select the report you want to see, by pressing its associated number as shown here:</td>
<td>You see this report on your screen:</td>
</tr>
<tr>
<td></td>
<td>2) SUMMARY FILE</td>
<td>Placement Analysis</td>
</tr>
<tr>
<td></td>
<td>3) DIAGNOSTIC FILE</td>
<td>Diagnostics for erroneously prepared records</td>
</tr>
<tr>
<td></td>
<td>4) ASSIGNMENTS BY ROOM</td>
<td>Listing of classes placed (by room)</td>
</tr>
<tr>
<td></td>
<td>5) ASSIGNMENTS BY DEPARTMENT</td>
<td>Listing of classes placed (by department)</td>
</tr>
<tr>
<td></td>
<td>6) EVENTS IMPOSSIBLE TO PLACE</td>
<td>Listing of classes impossible to place</td>
</tr>
<tr>
<td></td>
<td>7) EVENTS NOT PLACED</td>
<td>Listing of classes that could not be placed</td>
</tr>
<tr>
<td></td>
<td>8) ROOM AVAILABILITY REPORT</td>
<td>Listing of open rooms (by day of week/time)</td>
</tr>
</tbody>
</table>
Print instructions

After you have run SCHEDULE25, follow these instructions if you want to print reports.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action or Command</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>From the SCHEDULE25 menu screen (shown below), press &lt;3&gt;.</td>
<td>You see the Print Options screen shown here.</td>
</tr>
<tr>
<td>2</td>
<td>Select the report you want to print, by pressing its associated number as shown here:</td>
<td>This report is printed to your SCHEDULE25 printer:</td>
</tr>
<tr>
<td></td>
<td>2) SUMMARY FILE</td>
<td>Placement Analysis</td>
</tr>
<tr>
<td></td>
<td>3) DIAGNOSTIC FILE</td>
<td>Diagnostics for erroneously prepared records</td>
</tr>
<tr>
<td></td>
<td>4) ASSIGNMENTS BY ROOM</td>
<td>Listing of classes placed (by room)</td>
</tr>
<tr>
<td></td>
<td>5) ASSIGNMENTS BY DEPARTMENT</td>
<td>Listing of classes placed (by department)</td>
</tr>
<tr>
<td></td>
<td>6) EVENTS IMPOSSIBLE TO PLACE</td>
<td>Listing of classes impossible to place</td>
</tr>
<tr>
<td></td>
<td>7) EVENTS NOT PLACED</td>
<td>Listing of classes that could not be placed</td>
</tr>
<tr>
<td></td>
<td>8) ROOM AVAILABILITY REPORT</td>
<td>Listing of open rooms (by day of week/time)</td>
</tr>
</tbody>
</table>
Using the Diagnostics For Erroneously Prepared Records report

Introduction and report sample

If there are errors in a Campus Profile file or in the Class Descriptor file, view or print the Diagnostics For Erroneously Prepared Records report (instructions on page 8-8). This report lists the record(s) in error and the associated diagnostic message(s).

How to use the report

1. Review the record(s) and diagnostic message(s) listed on the report.

2. Check Chapter 9, Diagnostic Messages, to find out what each message means and how to correct the error.

3. For Campus Profile files:
   - Correct the record.
   - Rerun SCHEDULE25.

   For the Class Descriptor file:
   - Correct the class records in the course master and/or your class/section extract program.
   - Rerun the class/section extract program.
   - Rerun SCHEDULE25.

All errors should be corrected before you accept the room assignments made by SCHEDULE25.
Introduction and report sample

After successfully running SCHEDULE25 (no errors in the Campus Profile files and few or no errors in the Class Descriptor file), view or print the Placement Analysis report (instructions on page 8-8). The data in this report provides a summary of the SCHEDULE25 run. Based on the output in this report, you can determine what to do next.
Use the table below to determine what to do next based on the output data on this report.

<table>
<thead>
<tr>
<th>If the data in this field...</th>
<th>Is...</th>
<th>Then you know that...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Incorrectly Prepared</td>
<td>greater than 0 (zero)</td>
<td>There are errors in the Class Descriptor file that must be corrected. View or print the Diagnostics report, and follow the instructions on page 8-10.</td>
</tr>
<tr>
<td>Preassignments/Conflicting</td>
<td>greater than 0 (zero)</td>
<td>There are preassignments in the Class Descriptor file that have conflicting room/time requirements that must be corrected. View or print the Diagnostics report, and follow the instructions on page 8-10.</td>
</tr>
<tr>
<td>Room Requests/Impossible-To-Fill</td>
<td>greater than 0 (zero)</td>
<td>There are classes in the Class Descriptor file that are impossible to place and should be corrected. View or print the Impossible to Place report, and follow the instructions on page 8-14.</td>
</tr>
<tr>
<td>Room Requests/Not Placed</td>
<td>greater than 0 (zero)</td>
<td>There are classes in the Class Descriptor file that were not placed (“losers”). View or print the Could Not Be Placed report, and follow the instructions on page 8-16.</td>
</tr>
<tr>
<td>Priority3, Priority4</td>
<td>higher than you’d like</td>
<td>Not enough classes were placed in departments’ first or second choice location preferences. This may occur if some departments are very restrictive about the partitions they’ll teach in or the global or room fill ratio is too high. Try lowering the global or room fill ratio or changing departments’ preferred locations to be less restrictive, and then follow the instructions on page 8-17.</td>
</tr>
<tr>
<td>Average Utilization</td>
<td>less than you’d like</td>
<td>Your classroom seating capacities are not being well utilized based on the enrollments of the classes assigned. Try raising the global fill ratio in the Control file, and then follow the instructions on page 8-17. Be aware, however, that this may reduce the number of classes placed in departments’ first and second choice locations.</td>
</tr>
</tbody>
</table>
Using the Listing of Classes Impossible to Place report

**Introduction and report sample**

If there are impossible to place classes indicated in the Placement Analysis report, view or print the Listing of Classes Impossible to Place report (instructions on page 8-8). This report lists the class records that were impossible to place based on the conditions of their request.

<table>
<thead>
<tr>
<th>Course</th>
<th>Days</th>
<th>Time</th>
<th>Type</th>
<th>Start Date</th>
<th>End Date</th>
<th>Instructor</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECE 18901A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
<tr>
<td>ECE 18901A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
<tr>
<td>ECE 18903A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
<tr>
<td>ECE 18903A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
<tr>
<td>ECE 18905A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
<tr>
<td>ECE 18905A</td>
<td>TR</td>
<td>1530-1850</td>
<td>H</td>
<td>09/10</td>
<td>12/19</td>
<td>DH 1212</td>
<td>NSM STAFF</td>
</tr>
</tbody>
</table>
1. Review the records listed on the report, and determine why each was impossible to place. Here are some possible reasons:

- The class requirements are illogical. For example, if a class must be in partition 10, have seating for 35, and have a map of Spain, and no such room exists, that class record will appear on this report.

- Erroneous enrollment data has been entered (for example, 2000 instead of 200). If no room exists with a seating capacity of 2000, that class record will appear on this report.

- The only logical and valid room for a class is blacked out or has already been preassigned to another class on the same days, time, and dates. Under these conditions, SCHEDULE25 doesn’t see the room in its inventory, and that class record will appear on this report.

- A class is so small that it doesn’t meet the minimum fill ratio or so large that it won’t fit in any room that is acceptable to the department.

- If the “Sum Cross-Listed Enrollments” parameter in the Control file is YES, and the sum of a cross-listed set in the Class Descriptor file is larger than the capacity of any room in the rooms.dat file in the department’s preferred partition(s), the cross-listed records will appear on this report.

- Something is illogical in the department profile in the depts.dat file. This may be the problem if you see all the classes for one department on this report.

2. Correct the class records in the course master file and any applicable Campus Profile files (for example, depts.dat).

3. Rerun the class/section extract program.

4. Rerun SCHEDULE25.

In some cases, you may be comfortable with classes as “impossible to place”. If so, skip steps 2-4. If you are using 25E, you can load the notposs.dat file into a hold group and then find rooms for each impossible to place class.
Using the Listing of Classes That Could Not Be Placed report

Introduction and report sample

If there are unplaced classes (“losers”) indicated in the Placement Analysis report, view or print the Listing of Classes That Could Not Be Placed report (instructions on page 8-8). This report lists the class records that were not placed because of competition for the same room at the same time as other classes.
How to use the report

1. Review the records listed on the report, and determine why each was not placed. Check these fields in particular:

   - **Days of Week** and **Start Time/Finish Time**: Each campus has “peak” or “prime” times during which the largest number of classes are scheduled. The demand during these times often exceeds capacity. Review day and time combinations to determine if this is the reason some classes were not placed. You may have rooms open at these times, but not in the preferred partitions or containing the required physical features.

   - **Enrollment**: Large classes are often competing for only a few large classrooms or lecture halls, and popular sized classes are often competing for a fixed inventory of average-sized rooms. The fill ratio for some large rooms or the global fill ratio in the Control file might be preventing classes from being placed in larger rooms.

   - **Begin/End Date**: If SCHEDULE25 can fill a room for a whole semester or term rather than fill it with a half-semester/term class, it will do so.

2. View or print one or both of the Listing of Classes Placed reports, and review the placements that were made.

3. If you’re satisfied with the room assignments, continue to step 4.

   If you’re not satisfied with the room assignments, you may want to follow the special procedure on the next page.

4. If you’re not using 25E, you’re ready to run your room assignment update program (see page 8-23).

   If you are using 25E, you’re ready to load output files into 25E and run your room assignment update program (see page 8-23).
If you want to influence which classes are “losers” or are not satisfied with the SCHEDULE25 room assignments at this point in the process, you could follow the steps below to rerun SCHEDULE25 with modified input data. To do this procedure, you must be able to edit, concatenate, and rename files (see Appendix B).

1. Modify Campus Profile files as needed. For example, if you feel that some classes were “losers” because the global or room fill ratio was set too high, you might want to lower the global fill ratio in the Control file or the room fill ratio in the Rooms file.

2. Edit records in the \texttt{sortrm.dat} output file as you think necessary to get better placements.

3. Change the 5SM assignment codes of the records you’ve changed to NSM.

4. If they exist, concatenate the \texttt{losers.dat} and \texttt{notposs.dat} files to the \texttt{sortrm.dat} file.

5. Rename the \texttt{sortrm.dat} file to \texttt{datain.dat}.

Using the Listing of Classes Placed (by room) report

Introduction and report sample

To see all placed classes sorted by room, view or print the Listing of Classes Placed (by room) report (instructions on page 8-8).

<table>
<thead>
<tr>
<th>ROOMS/LT: 130</th>
<th>MIN FILL RATIO: 0.65</th>
<th>MM 103</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS: 1, 3, 4, 5, 12, 16, 17, 19, 27, 28, 31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROOM</th>
<th>DAYS</th>
<th>START TIME</th>
<th>END TIME</th>
<th>FFA</th>
<th>FFA DATE</th>
<th>MM</th>
<th>ROOMSIZE</th>
<th>FILL RATIO</th>
<th>STAFF</th>
<th>CLASS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHY 091171</td>
<td>MWF</td>
<td>1230</td>
<td>1320</td>
<td>115</td>
<td>FA 09/06</td>
<td>12/20</td>
<td>MM 103</td>
<td>ACA CLS</td>
<td>ASM STAFF</td>
<td>ACA CLS</td>
</tr>
<tr>
<td>CMIY 0911/71</td>
<td>TR</td>
<td>1830</td>
<td>1950</td>
<td>90</td>
<td>FA 09/10</td>
<td>12/19</td>
<td>MM 103</td>
<td>ACA CLS</td>
<td>SSN STAFF</td>
<td>ACA CLS</td>
</tr>
<tr>
<td>DES 51300A</td>
<td>TR</td>
<td>1330</td>
<td>1450</td>
<td>98</td>
<td>FA 09/09</td>
<td>12/18</td>
<td>MM 103</td>
<td>ACA CLS</td>
<td>SSN STAFF</td>
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<td>1020</td>
<td>120</td>
<td>FA 09/06</td>
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<td>1450</td>
<td>98</td>
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<td>12/18</td>
<td>MM 103</td>
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<td>1620</td>
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<td>1420</td>
<td>100</td>
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<td>100</td>
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<td>12/19</td>
<td>MM 103</td>
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<td>MM 103</td>
<td>ACA CLS</td>
<td>WSM STAFF</td>
<td>ACA CLS</td>
</tr>
</tbody>
</table>
How to use the report

1. Review the records listed on the report.

2. Look for any classes that appear oddly out of place. Is it a satisfactory assignment that is just nontraditional, or does it point to missing or erroneous information in the department’s profile or the Class Descriptor record?

3. Look for classes that are unusually small for their assigned room. Is there a fill ratio for the room? Is the class held only one day a week? (Such classes are “tucked” here and there by SCHEDULE25.)

4. Based on your findings, you may be satisfied with the room assignments and be ready to run your room assignment update program (see page 8-23), or you may be dissatisfied and want to change input data and rerun SCHEDULE25 (see page 8-17).
Using the Listing of Classes Placed (by department) report

Introduction and report sample

To see all placed classes sorted by department, view or print the Listing of Classes Placed (by department) report (instructions on page 8-8).
Using the Listing of Classes Placed (by department) report

How to use the report

1. Review the records listed on the report.

2. Look for any classes that have been placed in rooms that would be considered unacceptable to the sponsoring department. Does it point to missing or erroneous information in the department’s profile or the Class Descriptor record?

3. Based on your findings, you may be satisfied with the room assignments and be ready to run your room assignment update program (see page 8-23), or you may be dissatisfied and want to change input data and rerun SCHEDULE25 (see page 8-17).

4. If you have any classes in the “Other” department, you are missing a department profile.
Using the Listing of Open Rooms (by day of week/time) report

**Introduction and report sample**

To see all rooms that are still open after the SCHEDULE25 run by time block, view or print the Listing of Open Rooms (by day of week and time report (instructions on page 8-8).

### How to use the report

1. **Review the records listed on the report.**

2. **Check to see if any of the open rooms would be appropriate for any of the “losers” reported on the Listing of Classes The Could Not Be Placed report (losers.rpt).**

If you have 25E, we recommend that instead of using this report you load schedule data from SCHEDULE25 into 25E and look for available rooms online or via the 25E Class Matrix report.

---

**LISTING OF OPEN ROOMS (BY DAY OF WEEK AND TIME)**

**MONDAY**

<table>
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<tr>
<th>Time</th>
<th>Rooms</th>
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<tr>
<td>800</td>
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<tr>
<td></td>
<td>WEH 7500 WEH 8427 SH 324 SH 422 NBH 1000 NBH 1002 NBH 1003 NBH 1004 NBH 1006 NBH 1010 NBH</td>
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<tr>
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<td>BH-M0 125B BH-M0 125C BH-M0 125B BH-M0 125B BH-M0 125C BH-M0 130A BH-M0 225A BH-M0 225B BH-M0 2310 BH-M0 2310</td>
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<tr>
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<td>BH-M0 235A BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B</td>
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<tr>
<td></td>
<td>830 800A MM 103 SH 125 MM A14 SH 212 SH 220 SH 224 WEH 5205 WEH 5427 WEH 5423 WEH 7500 WEH 8427</td>
</tr>
<tr>
<td></td>
<td>SH 324 SH 422 NBH 1000 NBH 1002 NBH 1003 NBH 1004 NBH 1006 NBH 1010 NBH 1013 NBH</td>
</tr>
<tr>
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<td>BH-M0 125B BH-M0 125C BH-M0 125B BH-M0 125B BH-M0 125C BH-M0 130A BH-M0 225A BH-M0 225B BH-M0 2310 BH-M0 2310</td>
</tr>
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<td>BH-M0 235A BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B</td>
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<tr>
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<td>BH-M0 235A BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B</td>
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<td>BH-M0 125B BH-M0 125C BH-M0 125B BH-M0 125B BH-M0 125C BH-M0 130A BH-M0 225A BH-M0 225B BH-M0 2310 BH-M0 2310</td>
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<tr>
<td></td>
<td>BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B BH-M0 235B</td>
</tr>
<tr>
<td></td>
<td>2105 DH 2122 DH 2200 CFA 110 CFA 212 CFA 212 CFA 213</td>
</tr>
</tbody>
</table>
Running the room assignment update program

When you are satisfied with the assignments made by SCHEDULE25, run your institution’s room assignment update program. At some institutions, the scheduler runs this program. At others, the scheduler must request that this program be run by computer services.

The room assignment update program updates your institution’s course master or class section file with the room assignments made by SCHEDULE25.

If you are using 25E, you should also load the sortrm.dat or sortrm.pl file into 25E for the appropriate year. Loading the sortrm.pl file retains any P or L records associated with a Class Descriptor records. The sortrm.dat file does not include P and L records.

You should also load the losers.dat file (if you have one) into a 25E hold group and the notposs.dat file (if you have one) into a 25E hold group at this time.
Diagnostic Messages

Introduction

What's in this chapter

This chapter provides a complete list of the diagnostic messages generated by SCHEDULE25. The messages are grouped by input file and listed in alphabetical order within each group. The documentation of each message includes:

- The full text of the message
- A statement of what the message means
- A statement of how to correct the error

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<td>Class Descriptor (datain.dat) file messages</td>
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</tr>
</tbody>
</table>

Viewing SCHEDULE25 diagnostic messages

View or print the Diagnostics For Erroneously Prepared Records report to see the diagnostic message(s) for a SCHEDULE25 run and the associated file record(s). See chapter 6, SCHEDULE25 Reports and Output Files, for more information about this report and chapter 8, Running SCHEDULE25, for report browse and print instructions.
How diagnostic messages are generated in SCHEDULE25

SCHEDULE25 generates diagnostic messages when it encounters record errors during the file validation process that precedes the running of the assignment algorithm. SCHEDULE25 validates files and generates diagnostic messages in this way:

1. It validates the syntax and sequence numbering of the Campus Profile files in this order:
   - Physical Features file (phys.dat)
   - Campus Partitions file (part.dat)
   - Control file (ctrl.dat)
   - Rooms file (rooms.dat)
   - Departments file (depts.dat)

   When SCHEDULE25 encounters record errors in a Campus Profile file, it halts the run and generates the appropriate diagnostic messages for the file and conditions encountered. The number in brackets [ ] on the SCHEDULE25 processing screen indicates the record number of the last record read before the error that halted the run was encountered (see page 8-7).

2. It validates the Class Descriptor file and generates diagnostic messages for any error conditions encountered.

3. If there are errors in the Class Descriptor file, it checks the “Minimum Correct Input Fraction” parameter in the Control file. If the percentage of correct records in the Class Descriptor file is greater than or equal to the parameter percentage, it initiates the assignment algorithm and generates a classroom schedule. If the percentage of correct records is less than the percentage specified in the Control file, it halts the run before any classes are scheduled.

If there are no errors in the Class Descriptor file, it initiates the assignment algorithm and generates a classroom schedule.
Physical Features (phys.dat) file messages

?? PHYSICAL CHARACTERISTICS:
FILE CANNOT BE OPENED FOR INPUT

Meaning: The phys.dat file is missing, improperly named, or improperly secured.

To correct:
- Make sure a phys.dat file exists in the directory designated for SCHEDULE25 input in the runs25.com file.
- Make sure the correct file name is designated by the PHYS variable in the runs25.com file.
- Make sure the person running SCHEDULE25 has rw(read/write) privileges for the file and for the sched25 input directory.

?? PHYSICAL CHARACTERISTICS:
MORE THAN 96 CHARACTERISTICS HAVE BEEN DEFINED

Meaning: There are more than 96 records in the phys.dat file.

To correct:
- Reorganize your list of physical characteristics to equal 96 or fewer. Be sure to reflect any changes in the rooms.dat and depts.dat files.
- Make sure you don’t have a blank line at the end of the phys.dat file.
- Make sure you have a carriage return at the end of the last record in the file.

?? PHYSICAL CHARACTERISTICS:
NAME DOES NOT BEGIN IN COLUMN 1

Meaning: The first non-blank character in a phys.dat file physical feature name is not in column 1.

To correct:
- Edit the record in the phys.dat file so that the first non-blank character in the physical feature name is in column 1.
- Be sure there is a carriage return at the end of every line in the file, following column 80.
?? PHYSICAL CHARACTERISTICS:
RECORD OUT OF SEQUENCE

**Meaning:** A record in the `phys.dat` file does not appear in the order indicated by its sequence number.

**To correct:** Edit the `phys.dat` file, ensuring that the sequence numbers are integers, are in ordinal sequence, and that no numbers are skipped or duplicated.

?? PHYSICAL CHARACTERISTICS:
SEQUENCE NUMBER ERROR

**Meaning:** The sequence number in a `phys.dat` file record is either not right-justified in columns 79-80 or contains characters other than digits or blanks.

**To correct:**

- Edit the `phys.dat` record so that the sequence number is right-justified in columns 79-80 and so that only digits or blanks appear in columns 79-80.
- Be sure there is a carriage return at the end of every line, and that there are no blank lines at the top or bottom of the file.
Campus Partitions (part.dat) file messages

?? CAMPUS PARTITION:  
FILE CANNOT BE OPENED FOR INPUT  

Meaning: The part.dat file is missing, improperly named, or improperly secured.  

To correct:  
• Make sure a part.dat file exists in the directory designated for SCHEDULE25 input in the runs25.com file.  
• Make sure the correct file name is designated by the PART variable in the runs25.com file.  
• Make sure the person running SCHEDULE25 has rw(read/write) privileges for the file and for the sched25 input directory.

?? CAMPUS PARTITION:  
MORE THAN 96 PARTITIONS HAVE BEEN DEFINED  

Meaning: There are more than 96 records in the part.dat file.  

To correct:  
• Reorganize your list of campus partitions to equal 96 or fewer. Be sure to reflect any changes in the rooms.dat and depts.dat files.  
• Make sure you don’t have a blank line at the end of the part.dat file.  
• Make sure you have a carriage return at the end of the last record in the file.

?? CAMPUS PARTITION:  
RECORD OUT OF SEQUENCE  

Meaning: A record in the part.dat file does not appear in the order indicated by its sequence number.  

To correct: Edit the part.dat file, ensuring that the sequence numbers are integers, are in ordinal sequence, and that no numbers are skipped or duplicated.
?? CAMPUS PARTITION:  
SEQUENCE NUMBER ERROR

Meaning: The sequence number in a part.dat file record is either not right-justified in columns 79-80 or contains characters other than digits or blanks.

To correct:

- Edit the part.dat record so that the sequence number is right-justified in columns 79-80 and so that only digits or blanks appear in columns 79-80.
- Be sure there is a carriage return at the end of every line, and that there are no blank lines at the top or bottom of the file.

?? CAMPUS PARTITION:  
THE PARTITION NAME DOES NOT BEGIN IN COLUMN 1

Meaning: The first non-blank character in a part.dat file record partition name is not in column 1.

To correct:

- Edit the record in the part.dat file so that the first non-blank character in the partition name is in column 1.
- Be sure there is a carriage return at the end of every line in the file, following column 80.
Control (ctrl.dat) file messages

?? CONTROL FILE: A NON-BLANK, 1 OR 2 CHARACTER DAY OF THE WEEK ABBREVIATION MUST APPEAR LEFT-JUSTIFIED IN THE FIRST TWO COLUMNS

Meaning: Columns 1 and/or 2 of one or more of Control file records 4-10 are blank.

To correct: Edit the incorrect day of the week record(s) so that columns 1 and 2 contain one or two uppercase characters that represent each day of the week. If you’re using one character abbreviations, the character must be in column 1.

?? CONTROL FILE: A NON-NUMERIC APPEARS IN FIRST FOUR COLUMNS OF THE DEFAULT ENROLLMENT RECORD

Meaning: Columns 1-4 of the default enrollment record (record 27) in the ctrl.dat file contains non-numeric characters.

To correct: Edit the default enrollment record so that only digits appear in columns 1-4.

?? CONTROL FILE: DESCRIPTOR FIELD INCORRECTLY TYPED

Meaning: The descriptor field of a record in the ctrl.dat file is not identical to the corresponding example descriptor in the ctrl.dat file on your distribution media. See page 4-3 of this manual for an example of the ctrl.dat file.

To correct: Edit the descriptor field so it is identical to the corresponding example descriptor. The descriptor must be spelled correctly, begin in the correct column, be typed in all uppercase characters, and contain no tabs.
**Diagnostic Messages**

?? CONTROL FILE:
EITHER THE PARAMETER DOES NOT CONTAIN A DECIMAL POINT IN COLUMN 2 OR IT CONTAINS NON-NUMERICS

**Meaning:** Columns 1-4 of one or more of Control file records 24, 25, and 28 either does not contain a decimal point or contains non-numeric characters.

**To correct:** Edit columns 1-4 of the incorrect record(s) so that columns 1-4 contain \( n.nn \) where \( n \) is a digit and

- \( n \) appears in column 1
- a decimal point appears in column 2
- \( nn \) appears in columns 3 and 4

?? CONTROL FILE:
EXTRA FINISH MINUTES MUST NOT BE GREATER THAN 30 MINUTES

**Meaning:** Columns 1-2 of Control file record 34 contain a number greater than 30.

**To correct:** Edit Control file record 34 so that a number equal to or less than 30 appears in columns 1-2.

?? CONTROL FILE:
FILE CANNOT BE OPENED FOR INPUT

**Meaning:** The `ctrl.dat` file is missing, improperly named, or improperly secured.

**To correct:**

- Make sure a `ctrl.dat` file exists in the directory designated for SCHEDULE25 input in the `runs25.com` file.
- Make sure the correct file name is designated by the CTRL variable in the `runs25.com` file.
- Make sure the person running SCHEDULE25 has `rw` (read/write) privileges for the file and for the `sched25` input directory.
?? CONTROL FILE:  
INVALID TIME SPAN SPECIFIED

**Meaning:** The earliest start time parameter in Control file record 35 is greater than the latest finish time parameter in Control file record 36.

**To correct:** Edit Control file records 35 and/or 36 so that the earliest start time specified is less than the latest finish time specified.

?? CONTROL FILE:  
MAXIMUM RECORD SIZE CANNOT BE GREATER THAN 253

**Meaning:** Record 38 of the Control file defines the Class Descriptor record as more than 253 columns long. If you have 25E, 253 columns is the maximum length that can be defined for the Class Descriptor record.

**To correct:** Correct Control file record 38 so it defines the Class Descriptor record to be no more than 253 columns long. (Keep in mind that SCHEDULE25 reads only the first 80 columns of the Class Descriptor records.)

?? CONTROL FILE:  
MAXIMUM RECORD SIZE MUST BE GREATER THAN 79

**Meaning:** Record 38 of the Control file defines the Class Descriptor record as less than 80 columns long.

**To correct:** Correct Control file record 38 so it defines the Class Descriptor record to be at least 80 columns long. (Keep in mind that SCHEDULE25 reads only the first 80 columns of the Class Descriptor records.)

?? CONTROL FILE:  
MUST SPECIFY DATE COLUMNS BEFORE SPECIFYING DATES

**Meaning:** The Control file records that specify the position of the class begin and end dates in the Class Descriptor file are missing. You cannot specify DATES in record 33 if records 39-42 are not present.

**To correct:** Add records 39-42 to the Control file. See the sample Control file on the distribution media and on page 4-3 of this manual.
?? CONTROL FILE:
NON-NUMERIC APPEARS IN FIRST FOUR COLUMNS OF THE PARAMETER FIELD

**Meaning:** Columns 1-4 of Control file records 35 and 36 contain something other than numeric characters.

**To correct:** Edit columns 1-4 of Control file records 35 and 36 so they contain only numeric characters.

?? CONTROL FILE:
NON-NUMERIC APPEARS IN FIRST TWO COLUMNS

**Meaning:** Columns 1-2 of Control file records 1-3, 11-23, or 29-32 contain something other than numeric characters.

**To correct:** Edit columns 1-2 of the incorrect record(s) so they contain only numeric characters.

?? CONTROL FILE:
NON-NUMERIC APPEARS IN FIRST THREE COLUMNS OF LINE XXX

**Meaning:** Columns 1-3 of Control file records 38-42 contain something other than numeric characters.

**To correct:** Edit columns 1-3 of the incorrect record(s) so they contain only numeric characters.

?? CONTROL FILE:
NUMBER OF WEEKS MAY NOT EXCEED 54

**Meaning:** The number of weeks specified in Control file record 30 is greater than 54.

**To correct:** Edit the number of weeks in Control file record 30 so it is equal to or less than 54.

?? CONTROL FILE:
NUMERIC FORMAT ERROR IN FIRST 3 COLUMNS

**Meaning:** Column 2 of Control file records 38-42 is blank.

**To correct:** Edit columns 1-3 of the incorrect record(s).
?? CONTROL FILE:
PARAMETER FIELD CONTAINS NON-BLANK(S) IN COLUMNS 3 THROUGH 30

Meaning: Columns 3-30 of one or more of Control file records 1-23, 29-32, or 34 are not blank.

To correct: Edit columns 3-30 of the incorrect record(s) so they are blank. Use the space bar, not tabs.

?? CONTROL FILE:
PARAMETER FIELD CONTAINS NON-BLANK(S) IN COLUMNS 4 THROUGH 30

Meaning: Control file record 33 has something other than blanks in columns 4-30.

To correct: Edit control file record 33 so it has only blanks in columns 4-30. Use the space bar, not the tab key.

?? CONTROL FILE:
PARAMETER FIELD CONTAINS NON-BLANK(S) IN COLUMNS 5 THROUGH 30

Meaning: Columns 5-30 of one or more of Control file records 24-28 are not blank.

To correct: Edit columns 5-30 of the incorrect record(s) so they are blank. Use the space bar, not the tab key.

?? CONTROL FILE:
PARAMETER MUST BE GREATER THAN ZERO

Meaning: Columns 1-2 of one or more of Control file records 1-3, 11-23, or 29-32 have a blank or zero in columns 1 and 2. The parameter value for each of these records must be 01 or greater.

To correct: Edit columns 1-2 of the incorrect record(s) so that the parameter value is 01 or greater.
?? CONTROL FILE:
PARAMETER FIELD MUST CONTAIN EITHER “YES” OR “NO” OR “DATES” LEFT JUSTIFIED

**Meaning:** Control file record 33 has something other than YES, NO, or DATES in columns 1-5 and/or the parameter entry is not left-justified.

**To correct:** Edit the record so that either YES, NO, or DATES appears in columns 1-5, and the entry is left-justified beginning in column 1.

?? CONTROL FILE:
RECORD OUT OF SEQUENCE

**Meaning:** A record in the ctrl.dat file does not appear in the order indicated by its sequence number.

**To correct:** Edit the ctrl.dat file, ensuring that the sequence numbers are exactly as specified in the file example on the distribution media and on page 4-3 of this manual.

?? CONTROL FILE:
SEQUENCE NUMBER ERROR

**Meaning:** The sequence number in a ctrl.dat file record is either not right-justified in columns 79-80 or contains characters other than digits or blanks.

**To correct:**
- Edit the ctrl.dat record so that the sequence number is right-justified in columns 79-80 and so that only digits or blanks appear in columns 79-80.
- Make sure you have a carriage return at the end of the record.
- Make sure you don’t have a blank line at the end of the ctrl.dat file.

?? CONTROL FILE:
THE DAY OF THE WEEK ABBREVIATION MUST BE LEFT-JUSTIFIED IN THE PARAMETER FIELD

**Meaning:** Column 1 is blank and column 2 is non-blank in one or more of Control file records 4-10.

**To correct:** Enter the correct one or two character day of the week abbreviation beginning in column 1 of the incorrect record(s).
?? CONTROL FILE:
THE DAYS FIELD EXTENDS BEYOND COLUMN 77 OF THE M-RECORD

Meaning: The Days length and position specified in Control file records 3 and 11 would extend the field beyond column 77 of the Class Descriptor record.

To correct: Edit Control file records 3 and 11 so that the defined Days field would not extend beyond column 77 of the Class Descriptor record.

?? CONTROL FILE:
THE DEPARTMENTAL ID FIELD EXTENDS BEYOND COLUMN 77 OF THE M-RECORD

Meaning: The Department ID field position and length specified in Control file records 23 and 29 would extend the field beyond column 77 of the Class Descriptor record.

To correct: Edit Control file records 23 and 29 so that the defined Department ID field would not extend beyond column 77 of the Class Descriptor record.

?? CONTROL FILE:
THE DESIGNATED M-RECORD FIELDS OVERLAP

Meaning: The position of two or more fields in the Class Descriptor record would overlap as currently defined. Only the position of defined conflict deciders can overlap.

To correct: Verify the position and length of each field in the Class Descriptor record. Edit the appropriate Control file records so that no two fields overlap.

?? CONTROL FILE:
THE ENROLLMENT FIELD DOES NOT LIE WITHIN COLS. 1-77 OF THE M-RECORD

Meaning: The Enrollment field position defined in record 17 of the Control file would not place the field within columns 1-77 of the Class Descriptor record.

To correct: Edit Control file record 17 so that the defined Enrollment field is within columns 1-77 of the Class Descriptor record.
**Diagnostic Messages**

?? CONTROL FILE:
THE FIELD DESIGNATED DOES NOT LIE WITHIN COLUMNS 1-77 OF THE M-RECORD

**Meaning:** The field position specified in the Control file would not place this field within columns 1-77 of the Class Descriptor record.

**To correct:** Edit the field position definition in the Control file so that the field is within columns 1-77 of the Class Descriptor file.

?? CONTROL FILE:
THE FIELD DOES NOT LIE WITHIN THE DESIGNATED LENGTH OF THE M-RECORD

**Meaning:** The field position specified in the Control file would not place this field within the Class Descriptor record.

**To correct:** Edit the field position definition in the Control file so that the field is within the defined Class Descriptor record length.

?? CONTROL FILE:
THE FRACTION DESIGNATED EXCEEDS 100%

**Meaning:** The entry in the first four columns of either Control file record 24 or 28 is greater than 1.00. (format: n.nn)

**To correct:** Edit record 24 or record 28 so the entry in the first four columns does not exceed 1.00 (100%).

?? CONTROL FILE:
THE ROOM NAME FIELD EXTENDS BEYOND COLUMN 77 OF THE M-RECORD

**Meaning:** The Room Name field position and length specified in Control file records 1 and 2 would extend the field beyond column 77 of the Class Descriptor record.

**To correct:** Edit the Room Name field definition in Control file record 1 and 2 so that the defined Room Name field would not extend beyond column 77 of the Class Descriptor record.
?? CONTROL FILE:
THERE ARE NOT AT LEAST 36 RECORDS IN THIS FILE

Meaning: The Control file has fewer than 36 records.

To correct: Check for missing records. At minimum, records 01 - 36 must all be present. Verify the required records and their sequence numbers with the example on page 4-3 of this manual.

?? CONTROL FILE:
TIME VALUE IS INVALID

Meaning: The time designated on either Control file record 35 or 36 is either less than 0001 or greater than 2400.

To correct: Edit record 35 or 36 so that the time designated is in military format between 0001-2400.
Rooms (rooms.dat) file messages

?? ROOM PROFILE: 
A COLON MUST APPEAR IN COLUMN 14 OF THE B-RECORD

**Meaning:** A colon does not appear in column 14 of a B (blackout) record in the rooms.dat file.

**To correct:** Edit the indicated B record in the rooms.dat file so there is a colon in column 14.

?? ROOM PROFILE: 
‘A’, ‘P’ OR ‘H’ IS NOT ENTERED IN THE AM/PM FIELD

**Meaning:** A B (blackout) record in the rooms.dat file does not have an A, P, or H in the AM/PM field.

**To correct:** Edit the indicated B record by entering the correct time designation in the AM/PM field. A=am, P=pm, H=military time. The designator applies only to the finish time of the blackout period.

?? ROOM PROFILE: 
AN INVALID CODE APPEARS IN COLUMN 80

**Meaning:** A code other than N, S, B, L, P, or F appears in column 80 of a record in the rooms.dat file, or a line does not have a carriage return at the end of it.

**To correct:** Edit the record by entering the correct code (N, S, B, L, P, or F) in column 80. Make sure that there are no line wraps, that there are no blanks past column 80, and that there are no blank lines at the end of the file.

?? ROOM PROFILE: 
BLANK FOLLOWS DIGIT IN FINISH HOURS FIELD

**Meaning:** A blank follows the entry in the Finish Time field of a B (blackout) record in the rooms.dat file.

**To correct:** Make sure A (am), P (pm), or H (military time) appears in column 19 immediately following the last Finish Time digit.
?? ROOM PROFILE:
BLANK FOLLOWS DIGIT IN START HOURS FIELD

Meaning: A blank follows the entry in the Start Time field of a B (blackout) record in the rooms.dat file.

To correct: Make sure a colon appears in column 14 immediately following the last Start Time digit.

?? ROOM PROFILE:
COLUMNS 8 AND 9 OF THE B-RECORD MUST BE BLANK

Meaning: Columns 8 and/or 9 of a B (blackout) record in the rooms.dat file are not blank.

To correct: Edit the B record so that columns 8 and/or 9 are blank. Use the space bar, not the tab key.

?? ROOM PROFILE:
EITHER THE PARAMETER DOES NOT HAVE A DECIMAL POINT IN COLUMN 2 OR IT CONTAINS NON-NUMERICS

Meaning: The parameter field of an F (fill ratio) record in a room profile either does not contain a decimal point or contains non-numeric characters.

To correct: Edit the indicated F record in the room profile so that the parameter field is specified as n.nn where n is a digit. The entry in this field must be left-justified.

?? ROOM PROFILE:
FILE CANNOT BE OPENED FOR INPUT

Meaning: The rooms.dat file is missing, improperly named, or improperly secured.

To correct:

- Make sure a rooms.dat file exists in the directory designated for SCHEDULE25 input in the runs25.com file.
- Make sure the correct file name is designated by the ROOMS variable in the runs25.com file.
- Make sure the person running SCHEDULE25 has rw(read/write) privileges for the file and for the sched25 input directory.
**?? ROOM PROFILE:**
**INCORRECT PARTITION DESIGNATED ON L-RECORD**

**Meaning:** An L (location partition) record in the `rooms.dat` file contains characters other than blanks or numerics in columns 1-79, or the numeric specified is greater than the total number of partitions defined in the `part.dat` file.

**To correct:** Edit the indicated L record so that columns 1-79 only contain numerics or blanks or so that the numeric specified is equal to or less than the number of partitions defined in the `part.dat` file. Use the space bar, not the tab key.

---

**?? ROOM PROFILE:**
**INCORRECT PHYS CHAR DESIGNATION ON P-RECORD**

**Meaning:** A P (physical features) record in the `rooms.dat` file has one or more of these errors:

- Columns 1-79 contain characters other than blanks, commas, dashes, or numerics
- It contains a number designating a required physical feature that is greater than the total number of defined physical features
- It contains a descending range of physical features (example: 19-15)
- It contains duplicate physical features (example: 10,10)

**To correct:** Edit the indicated P record in the `rooms.dat` file so the required physical features are correctly specified.

---

**?? ROOM PROFILE:**
**INVALID TIME SPAN SPECIFIED (SAME START AND END TIME)**

**Meaning:** The start and end times specified on a B (blackout) record are the same.

**To correct:** Edit the indicated B record by correcting the start and/or end times specified.
?? ROOM PROFILE:
MORE THAN ONE FULLNESS RATIO RECORD HAS BEEN INCLUDED FOR THIS ROOM

**Meaning:** There is more than one F (fill ratio) record for a room in the rooms.dat file.

**To correct:** Delete all but one of the F records for this room.

?? ROOM PROFILE:
MORE THAN ONE LOCATION RECORD HAS BEEN INCLUDED FOR THIS ROOM

**Meaning:** There is more than one L (location partition) record for a room in the rooms.dat file.

**To correct:** Delete all but one of the L records for this room. A room can be in only one partition location.

?? ROOM PROFILE:
MORE THAN ONE PHYSICAL CHARACTERISTICS RECORD HAS BEEN INCLUDED FOR THIS ROOM

**Meaning:** There is more than one P (physical features) record for a room in the rooms.dat file.

**To correct:** Delete all but one of the P records for this room and edit that record so that it contains all the room’s physical features.

?? ROOM PROFILE:
MORE THAN ONE SIZE RECORD HAS BEEN INCLUDED FOR THIS ROOM

**Meaning:** There is more than one S (size) record for a room in the rooms.dat file.

**To correct:** Delete all but one of the S records for this room.

?? ROOM PROFILE:
NO L-RECORD WAS INCLUDED FOR THIS ROOM

**Meaning:** A room in the rooms.dat file has no associated L (location partition) record.

**To correct:** Edit the rooms.dat file and add an L record for the indicated room. Each room must be in one and only one partition location.
9  Diagnosis Messages

?? ROOM PROFILE:
NO MORE THAN XXXX ROOMS MAY BE DEFINED FOR SCHEDULE25
MODELXXX

Meaning: Your rooms.dat file contains more rooms than your SCHEDULE25 license authorizes.

To correct:

• Remove rooms from your rooms.dat file.

    OR

• Create separate Rooms and Class Descriptor files for classes and labs, so you have fewer records in each file.

    OR

• Call Universal Algorithms at (503) 973-5200 to license a larger model of SCHEDULE25.

?? ROOM PROFILE:
NO N-RECORD APPEARS BEFORE THIS RECORD

Meaning: The rooms.dat file contains an S, L, P, B, or F record that is not preceded in the file by an N record.

To correct: Insert an N record prior to the S, L, P, B, or F record that is in error.

?? ROOM PROFILE:
NO N-RECORD APPEARS IN FILE

Meaning: There are no N (name) records in the rooms.dat file.

To correct: Edit the rooms.dat file and add N records.

?? ROOM PROFILE:
NON-BLANK APPEARS IN COLUMN 79

Meaning: A record in the rooms.dat has something other than blank in column 79.

To correct: Edit the indicated record so that column 79 is blank.
?? ROOM PROFILE:
NON-BLANK(S) APPEAR WITHIN COLUMNS 74 THROUGH 75

Meaning: A B, S, F, or N record in the rooms.dat file has something other than blanks in columns 74 and 75 (column 75 only if you have over 1000 records in the rooms.dat file).

To correct: Edit the record so that only blanks appear in columns 74-75 (or 75 only if you have more than 1000 records in rooms.dat). Use the space bar, not the tab key.

?? ROOM PROFILE:
NON-NUMERIC(S) APPEAR(S) IN COLUMNS XXX

Meaning: The designated column(s) of a record in the rooms.dat file contains something other than numeric characters.

To correct: Edit the record so that the specified column(s) contains only numeric characters.

?? ROOM PROFILE:
NON-NUMERIC APPEARS IN SIZE FIELD

Meaning: An S (size) record in the rooms.dat file contains non-numeric characters or blanks in columns 1-4.

To correct: Edit the indicated S record so that only digits appear in columns 1-4.

?? ROOM PROFILE:
NO S-RECORD WAS INCLUDED FOR THIS ROOM

Meaning: A room in the rooms.dat file does not have an associated S (size) record.

To correct: Edit the rooms.dat file and add an S record for the room.
?? ROOM PROFILE:
ONLY X’S AND BLANKS ARE PERMITTED IN THE FIRST SEVEN COLUMNS
OF A B-RECORD

**Meaning:** A B (blackout) record in the *rooms.dat* file has something other
than X or blank in columns 1-7.

**To correct:** Edit the indicated B record so that columns 1-7 contain only
uppercase Xs or blanks. Each of the first seven columns represents a day
of the week, Sunday through Saturday.

?? ROOM PROFILE:
ROOM NAME DOES NOT BEGIN IN COLUMN 1

**Meaning:** The first non-blank character in a *rooms.dat* file record room
name is not in column 1.

**To correct:** Edit the indicated record in the *rooms.dat* file so that the first
non-blank character in the room name is in column 1.

?? ROOM PROFILE:
ROOM NAME IS NOT UNIQUE

**Meaning:** The room name in a record in the *rooms.dat* file is not unique.
Two or more room profiles have the same room name.

**To correct:** Edit the room name in the indicated record so that it is unique.
SCHEDULE25 only looks at non-blank characters in the room name in
determining whether the room name is unique or not. For example,
SCHEDULE25 does not consider “610 NEW TON” to be different from
“610NEWTON”.
?? ROOM PROFILE:
SEQUENCE NUMBER ERROR

**Meaning:** A record in the `rooms.dat` file does not appear in the order indicated by its sequence number.

**To correct:**

- Edit the `rooms.dat` file, ensuring that the sequence numbers are integers, are in ordinal sequence, and that no numbers are skipped or duplicated.
- Make sure you don’t have a blank line at the end of the `rooms.dat` file.
- Make sure you have a carriage return at the end of the last record in the file.

?? ROOM PROFILE:
THE FINISH HOUR IS NOT BETWEEN 1 AND 12

**Meaning:** The finish time specified on a B (blackout) record in the `rooms.dat` file is not between 1 and 12, although the A/P designator field is set to A or P (civilian time).

**To correct:** Edit the indicated B record in the `rooms.dat` file to specify a finish time between 1 and 12.

?? ROOM PROFILE:
THE FINISH HOUR IS NOT BETWEEN 0 AND 24

**Meaning:** The finish time specified on a B (blackout) record in the `rooms.dat` file is not between 1 and 24, although the A/P designator field is H (military time).

**To correct:** Edit the indicated B record in the `rooms.dat` file to specify a finish time between 0 and 24.

?? ROOM PROFILE:
THE FINISH HOURS FIELD CONTAINS NON-NUMERIC(S)

**Meaning:** Something other than digits appears in the Finish Time field of a B (blackout) record in the `rooms.dat` file.

**To correct:** Edit the indicated B record in the `rooms.dat` file to specify the correct finish time (no non-numeric characters).
?? ROOM PROFILE:  
THE FINISH MINUTES EXCEED 59  

**Meaning:** The finish minutes specified on a B (blackout) record in the *rooms.dat* file is greater than 59.

**To correct:** Edit the indicated B record in the *rooms.dat* file to specify the correct finish minute (from 0-59).

?? ROOM PROFILE:  
THE FINISH MINUTES FIELD CONTAINS NON-NUMERIC(S)  

**Meaning:** Something other than digits appears in the Finish Minutes field of a B (blackout) record in the *rooms.dat* file.

**To correct:** Edit the indicated B record in the *rooms.dat* file to specify the correct finish minute (from 0-59, no non-numeric characters).

?? ROOM PROFILE:  
THE FINISH TIME SPECIFIED IS EARLIER THAN xxxx  

**Meaning:** The finish time specified on a B (blackout) record in the *rooms.dat* file is earlier than the earliest start time specified in record 35 of the Control file.

**To correct:** Edit the indicated B record in the *rooms.dat* file to specify a finish time that is later than the earliest start time specified in record 35 of the Control file, or edit record 35 of the Control file and change the earliest start time to an earlier time.

?? ROOM PROFILE:  
THE FINISH TIME SPECIFIED IS LATER THAN yyyy  

**Meaning:** The finish time specified on a B (blackout) record in the *rooms.dat* file is later than the latest finish time specified in record 36 of the Control file.

**To correct:** Edit the indicated B record in the *rooms.dat* file to specify a finish time that is earlier than the latest finish time specified in record 36 of the Control file, or edit record 36 of the Control file and change the latest finish time to a later time.
?? ROOM PROFILE:
THE FRACTION DESIGNATED EXCEEDS 100 PERCENT

**Meaning:** The parameter field of an F (fill ratio) record in the *rooms.dat* file is greater than 1.00.

**To correct:** Edit the parameter field of the indicated F record so that it contains a number from 0.01-1.00.

?? ROOM PROFILE:
THE ROOM SIZE MUST BE GREATER THAN ZERO.

**Meaning:** An S (size) record in the *rooms.dat* file specifies a room size of zero.

**To correct:** Edit the indicated S record to specify a room size greater than zero.

?? ROOM PROFILE:
THE START HOUR FIELD CONTAINS NON-NUMERIC(S)

**Meaning:** Something other than digits appears in the Start Time field of a B (blackout) record in the *rooms.dat* file.

**To correct:** Edit the indicated B record in the *rooms.dat* file to specify the correct start hour (no non-numeric characters).

?? ROOM PROFILE:
THE START HOUR IS NOT BETWEEN 1 AND 12

**Meaning:** The start time specified on a B (blackout) record in the *rooms.dat* file is not between 1 and 12, although the A/P designator field is A or P (civilian time).

**To correct:** Edit the indicated record in the *rooms.dat* file to specify a start time between 1 and 12.
??? ROOM PROFILE:
THE START HOUR IS NOT BETWEEN 0 AND 24

Meaning: The start time specified on a B (blackout) record in the
rooms.dat file is not between 1 and 24, although the A/P designator field is
H (military time).

To correct: Edit the indicated B record in the rooms.dat file to specify a
start time between 0 and 24.

??? ROOM PROFILE:
THE START MINUTES EXCEED 59

Meaning: The start minute specified on a B record in the rooms.dat file is
greater than 59.

To correct: Edit the indicated B record in the rooms.dat file to specify the
correct start minute (from 1-59).

??? ROOM PROFILE:
THE START MINUTES FIELD CONTAINS NON-NUMERIC(S)

Meaning: Something other than digits appears in the Start Minute field of
a B (blackout) record in the rooms.dat file.

To correct: Edit the indicated B record in the rooms.dat file to specify the
correct start minute (from 1-59, no non-numeric characters).

??? ROOM PROFILE:
THE START TIME SPECIFIED IS EARLIER THAN XXXX

Meaning: The start time specified on a B (blackout) record in the
rooms.dat file is earlier than the earliest start time specified in record 35 of
the Control file.

To correct: Edit the B record in the rooms.dat file to specify a start time
that is later than the earliest start time specified in record 35 of the Control
file, or edit record 35 of the Control file and change the earliest start time
to an earlier time.
?? ROOM PROFILE:  
THE START TIME SPECIFIED IS LATER THAN yyyy

**Meaning:** The start time specified on a B (blackout) record in the rooms.dat file is later than the latest finish time specified in record 36 of the Control file.

**To correct:** Edit the B record in the rooms.dat file to specify a start time that is earlier than the latest finish time specified in record 36 of the Control file, or edit record 36 of the Control file and change the latest finish time to a later time.

?? ROOM PROFILE:  
WARNING...TIME SPAN SPECIFIED INCLUDES MIDNIGHT

**Meaning:** The time span specified on a B (blackout) record in the rooms.dat file spans midnight.

**To correct:** Check to make sure the time span specified on the indicated B record is correct. You may have transposed the start and finish times.
Departments (depts.dat) file messages

?? DEPT PROFILE:
FILE CANNOT BE OPENED FOR INPUT

**Meaning:** The *depts.dat* file is missing, improperly named, or improperly secured.

**To correct:**
- Make sure a *depts.dat* file exists in the directory designated for SCHEDULE25 input in the *runs25.com* file.
- Make sure the correct file name is designated by the DEPTS variable in the *runs25.com* file.
- Make sure the person running SCHEDULE25 has **rw** (read/write) privileges for the file and for the sched25 input directory.

?? DEPT PROFILE:
INCORRECT PARTITION DESIGNATION ON C-RECORD

**Meaning:** A C (campus partition preference) record in the *depts.dat* file has one or more of these errors:
- It contains a number designating a preferred partition that is greater than the total number of defined partitions
- It contains a descending range of partitions (example: 22-17)
- It contains duplicate partition numbers (example: 11,4,11)

**To correct:** Edit the indicated C record in the *depts.dat* file so the partition preferences are correctly specified.
?? DEPT PROFILE:  
INCORRECT PHYS CHAR DESIGNATION ON P-RECORD

Meaning: A P (physical feature requirement) record in the depts.dat file has one or more of these errors:

- It contains a number designating a required physical feature that is greater than the total number of defined physical features
- It contains a descending range of physical features (example: 19-15)
- It contains duplicate physical features (example: 10,10)

To correct: Edit the indicated P record in the depts.dat file so the required physical features are correctly specified.

?? DEPT PROFILE:  
INVALID CODE APPEARS IN COLUMN 80

Meaning: A character other than N, K, P, or C appears in column 80 of a depts.dat file record.

To correct: Edit the indicated record in the depts.dat file so that the correct code (N, K, P, or C) appears in column 80. Make sure there are no line wraps and that there are no blanks past column 80.

?? DEPT PROFILE:  
KEY FIELD IS BLANK

Meaning: A K (key) record in the depts.dat file contains only blanks in columns 1-x (x is the value assigned to the Length of Departmental ID parameter in the Control file).

To correct: Edit the depts.dat file and create a valid K record for the department profile in error.

?? DEPT PROFILE:  
MORE THAN ONE KEY RECORD HAS BEEN INCLUDED FOR THIS DEPARTMENT

Meaning: The depts.dat file has two or more K records for one department.

To correct: Edit the depts.dat file and delete all but one of the K records for the department profile in error.
## Diagnostic Messages

### ?? DEPT PROFILE:
MORE THAN ONE PHYSICAL CHARACTERISTICS RECORD HAS BEEN INCLUDED FOR THIS DEPARTMENT

**Meaning:** A department in the `depts.dat` file has more than one P (physical feature requirement) record.

**To correct:** Delete all but one P record for the department. If required, edit that P record so that the required physical features are correctly specified.

### ?? DEPT PROFILE:
MORE THAN 4 C-RECORDS HAVE BEEN INCLUDED FOR THIS DEPARTMENT

**Meaning:** A department in the `depts.dat` file has more than four C (campus partition preference) records.

**To correct:** Delete excess C records until you have 1-4 C records for the department. If required, edit those C records so that the preferred partitions are correctly specified.

### ?? DEPT PROFILE:
NO C-RECORD WAS INCLUDED FOR THIS DEPARTMENT

**Meaning:** A department in the `depts.dat` file has no C (campus partition preference) records.

**To correct:** Edit the `depts.dat` file to add 1-4 C records for the indicated department. Every department must have at least one C record.

### ?? DEPT PROFILE:
NO K-RECORD WAS INCLUDED FOR THIS DEPARTMENT

**Meaning:** A department in the `depts.dat` file has no K (key) record.

**To correct:** Edit the `depts.dat` file and add a K record for the indicated department.
?? DEPT PROFILE:
NO MORE THAN 500 DEPARTMENTS MAY BE PROFILED FOR SCHEDULE25

Meaning: There are more than 500 records in the depts.dat file.

To correct:

- Delete records in the depts.dat file until you have no more than 500.
- Make sure you don’t have a blank line at the end of the depts.dat file.

?? DEPT PROFILE:
NO N-RECORD APPEARS BEFORE THIS RECORD

Meaning: The depts.dat file contains a K (key), P (physical feature requirement), or C (campus partition preference) record that is not preceded in the file by an N (name) record.

To correct: Insert an N record prior to the K, P, or C record that is in error.

?? DEPT PROFILE:
NO N-RECORD APPEARS IN FILE

Meaning: A department in the depts.dat file does not have an N (name) record.

To correct: Edit the depts.dat file and add an N record for the department.

?? DEPT PROFILE:
NON-BLANK APPEARS IN COLUMN 79

Meaning: An N (name), K (key), or P (physical features) record in the depts.dat file does not have a blank in column 79.

To correct: Edit the N, K, or P record so that column 79 is blank. Use the space bar, not the tab key.
9 ◆ Diagnostic Messages

?? DEPT PROFILE:
NON-BLANK(S) APPEAR WITHIN COLUMNS X THROUGH 75

Meaning: Columns x - 75 in an N (name) or K (key) record in the depts.dat file are not blank. The value of x depends on whether the record in error is an N record or a K record.

To correct: Edit the N or K record so that columns x-75 are blank. Use the space bar, not the tab key.

?? DEPT PROFILE:
NON-NUMERIC APPEARS IN COL. 79 OF THIS C-RECORD

Meaning: A character other than 1, 2, 3, or 4 appears in column 79 of a C (campus partition preference) record in the depts.dat file.

To correct: Edit the C record so that 1, 2, 3, or 4 appears in column 79.

?? DEPT PROFILE:
NON-NUMERIC(S) APPEAR(S) IN COLS. 76-78

Meaning: Characters other than a three-digit profile number appear in columns 76-78 of a depts.dat file record.

To correct: Edit the record so that the three-digit profile sequence number appears in columns 76-78.

?? DEPT PROFILE:
SEQUENCE NUMBER ERROR

Meaning: A record in the depts.dat file does not appear in the order indicated by its sequence number.

To correct:

• Edit the depts.dat file, ensuring that the sequence numbers are integers, are in ordinal sequence, and that no numbers are skipped or duplicated.

• Make sure you don’t have a blank line at the end of the depts.dat file.

• Make sure you have a carriage return at the end of the last record in the file.
?? DEPT PROFILE:  
THE DEPARTMENT NAME DOES NOT BEGIN IN COLUMN 1  

**Meaning:** The first non-blank character in a `depts.dat` file record department name is not in column 1.

**To correct:**

- Edit the record in the `depts.dat` file so that the first non-blank character in the department name is in column 1.
- Be sure there is a carriage return at the end of every line in the file, following column 80.

?? DEPT PROFILE:  
THE KEY SPECIFIED IS NOT UNIQUE  

**Meaning:** Two or more K (key) records in the `depts.dat` file contain the same non-blank characters in columns 1-x (x is the value assigned to the Length of Departmental ID parameter in the Control file).

**To correct:** Edit the `depts.dat` file so that each department has a unique abbreviation key (K record).

?? DEPT PROFILE:  
THIS C-RECORD IS INCORRECTLY NUMBERED (COLUMN 79) AND/OR OUT OF SEQUENCE WITH THE OTHER C-RECORDS IN THE PROFILE  

**Meaning:** The number in column 79 of a C (campus partition preference) record in the `depts.dat` file is neither “1” nor one greater than the number appearing in column 79 of the preceding C record.

**To correct:** Edit the number in column 79 of the indicated C record so it is either “1” or one greater than the number appearing in column 79 of the preceding C record.
Class Descriptor (datain.dat) file messages

Most of the errors reported by the diagnostic messages in this section are best corrected by ensuring that your course master data is correct and/or by changing the program that extracts course master data and builds your institution’s Class Descriptor file. You would seldom edit the Class Descriptor file directly to correct the following error conditions.

?? A BLANK RECORD IS IN THIS SET

**Meaning:** There is a blank line with a carriage return at the end somewhere in the Class Descriptor file (usually at the top or the bottom of the file).

**To correct:** Ensure that the extract program is not creating any blank lines with carriage returns in the Class Descriptor file.

?? ‘A’ ‘P’ OR ‘H’ IS NOT ENTERED IN THE AM/PM FIELD

**Meaning:** A blank or a character other than A, P, or H is in the A/P designator field of a class record.

**To correct:** Ensure that the extract program is entering the correct designator (A, P, or H) in the A/P designator field for each class. ‘A’ indicates the class finish time is AM (before noon), ‘P’ indicates the class finish time is in the afternoon or evening, and ‘H’ indicates military time.

?? A P-RECORD HAS ALREADY BEEN READ FOR THIS SET

**Meaning:** There is more than one P (physical feature requirements) record for a class.

**To correct:** Ensure that the extract program is creating only one P (physical feature requirements) record for each class and that the P records contain all the required physical features for each class.
**?? AN L-RECORD HAS ALREADY BEEN READ FOR THIS SET**

**Meaning:** There is more than one L (location preference) record for a class.

**To correct:** Ensure that the extract program is creating only one L record for each class, and that the L records contain all location preferences for each class.

**?? BEGIN DATE CANNOT BE GREATER THAN END DATE**

**Meaning:** The begin date specified in a Class Descriptor record is later than the specified end date.

**To correct:** Ensure that the begin and end dates specified in the course master file for this class are correct and that they have not been transposed. Check the Control file to verify the column positions of the Begin and End Date fields.

**?? BEGIN DAY FIELD CANNOT BE ZERO**

**Meaning:** The begin day specified in a Class Descriptor record is zero.

**To correct:** Ensure that the begin date in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file. Check the Control file to verify the column position of the Begin Date field.

**?? BEGIN DAY FIELD EXTENDS PAST END OF M-RECORD**

**Meaning:** The begin day field extends past the end of a Class Descriptor record as defined in the Control file.

**To correct:** Check the Control file to verify that record 40 positions the Begin Day of Month field between columns 1 and 77 of the Class Descriptor record.

**?? BEGIN MONTH FIELD CANNOT BE ZERO**

**Meaning:** The begin month specified in a Class Descriptor record is zero.

**To correct:** Ensure that the begin month in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file. Check the Control file to verify the column position of the Begin Month field.
**?? BEGIN MONTH FIELD EXTENDS PAST END OF M-RECORD**

**Meaning:** The begin month field extends past the end of the Class Descriptor record as defined in the Control file.

**To correct:** Check the Control file to verify that record 39 positions the Begin Month field between columns 1 and 77 of the Class Descriptor record.

**?? BEGIN MONTH MUST BE BETWEEN 1 AND 12**

**Meaning:** The entry in the begin month field of a Class Descriptor record is not a number between 1 and 12.

**To correct:** Ensure that the begin month specified in the course master file for the class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

**?? BLANK FOLLOWS DIGIT IN FINISH HOURS FIELD**

**Meaning:** A one-digit finish hour is left-justified in the Finish Hours field.

**To correct:** Ensure that the extract program is right-justifying one-digit entries in the Finish Hours field of Class Descriptor records.

**?? BLANK FOLLOWS DIGIT IN START HOURS FIELD**

**Meaning:** A one-digit start hour is left-justified in the Start Hours field.

**To correct:** Ensure that the extract program is right-justifying one-digit entries in the Start Hours field of Class Descriptor records.

**?? CLASS DESCRIPTOR FILE CANNOT BE OPENED FOR INPUT**

**Meaning:** The datain.dat file is missing, improperly named, or improperly secured.

**To correct:**

- Make sure a datain.dat file exists in the directory designated for SCHEDULE25 input in the runs25.com file.
- Make sure the correct file name is designated by the DATAIN variable in the runs25.com file.
- Make sure the person running SCHEDULE25 has rw(read/write) privileges for the file and for the sched25 input directory.
**?? DATE SPAN XXX TO XXX EXCEEDS LIMIT SPECIFIED IN CONTROL FILE**

**Meaning:** The date span specified in a Class Descriptor record is greater than the Number of Weeks in Term defined in record 30 of the Control file.

**To correct:**
- Ensure that the date span specified in the course master file for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.
- Check the Number of Weeks in Term parameter entry in record 30 of the Control file. The parameter should be equal to or greater than the number of weeks spanned by the longest class in the Class Descriptor file.

**?? DAY OF BEGIN MONTH MUST BE BETWEEN 1 AND XX**

**Meaning:** The entry in the begin day field of a Class Descriptor record is not a number from 1 to xx (“xx” is the last day of the specified begin month - 29, 30, or 31).

**To correct:** Ensure that the begin day specified in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

**?? DAY OF END MONTH MUST BE BETWEEN 1 AND XX**

**Meaning:** The entry in the end day field of a Class Descriptor record is not a number from 1 to xx (“xx” is the last day of the specified end month - 29, 30, or 31).

**To correct:** Ensure that the end day specified in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

**?? END DAY FIELD CANNOT BE ZERO**

**Meaning:** The end day specified in a Class Descriptor record is zero.

**To correct:** Ensure that the end date in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.
**?? END DAY FIELD EXTENDS PAST END OF M-RECORD**

**Meaning:** The end day field extends past the end of a Class Descriptor record as defined in the Control file.

**To correct:** Check the Control file to verify that record 42 positions the End Day of Month field between columns 1 and 77 of the Class Descriptor record.

**?? END MONTH FIELD CANNOT BE ZERO**

**Meaning:** The end month specified in a Class Descriptor record is zero.

**To correct:** Ensure that the end month in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

**?? END MONTH FIELD EXTENDS PAST END OF M-RECORD**

**Meaning:** The end month field extends past the end of the Class Descriptor record as defined in the Control file.

**To correct:** Check the Control file to verify that record 41 positions the End Month field between columns 1 and 77 of the Class Descriptor record.

**?? END MONTH MUST BE BETWEEN 1 AND 12**

**Meaning:** The entry in the end month field of a Class Descriptor record is not a number between 1 and 12.

**To correct:** Ensure that the end month specified in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

**?? FINISH WEEK FIELD IS IMPROPERLY CODED**

**Meaning:** There is an invalid entry in the Finish Week field of a class record.

**To correct:** Ensure that the extract program is correctly formatting the entry in the Finish Week field.
?? FOR THE PRECEDING H-TYPE RECORD(S) THERE IS (ARE) NO V-TYPE RECORD(S)

**Meaning:** There is an HSM (preassigned, cross-listed) record in the Class Descriptor file that has no associated VSM record(s) to complete the cross-listed set.

**To correct:** Ensure that the data in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

?? FOR THE PRECEDING V-TYPE RECORD(S) THERE IS (ARE) NO H-TYPE RECORD(S)

**Meaning:** There is a VSM (preassigned, cross-listed) record in the Class Descriptor file that has no associated HSM record to complete the cross-listed set.

**To correct:** Ensure that data in the course master for this class is correct and that the extract program is entering the information correctly in the Class Descriptor file.

?? INVALID CODE IN COLUMN 78

**Meaning:** A character other than 1, N, A, H, V, R, W, or 5 appears in column 78 of an M record in the Class Descriptor file.

**To correct:** Ensure that the extract program is inserting the correct first letter or digit of a valid assignment code in column 78 of each Class Descriptor M record.

?? INVALID CODE IN COLUMN 79

**Meaning:** A character other than S or X appears in column 79 of an appropriate M record in the Class Descriptor file.

**To correct:** Ensure that the extract program is inserting the correct second letter of a valid assignment code in column 79 of each Class Descriptor M record.
?? INVALID TIME SPAN SPECIFIED (SAME START AND END TIME)

**Meaning:** The start and end times specified in a Class Descriptor record are the same.

**To correct:** Ensure that the start and end times specified in the course master for this class are correct and that the extract program is entering the information correctly in the Class Descriptor file.

?? LENGTH OF RECORD EXCEEDS MAXIMUM DEFINED IN CONTROL FILE

**Meaning:** A record in the Class Descriptor file exceeds the maximum record length specified in the Control file.

**To correct:** Correct the extract program to include only the maximum number of columns as defined in record 38 of the Control file.

?? L-RECORD SHOULD NOT FOLLOW AN M-RECORD FOR A CLASS DESIGNATED AS SHARING A ROOM

**Meaning:** An L record follows an HSM or VSM record in the Class Descriptor file.

**To correct:** Ensure that the extract program does not place L records after HSM or VSM records in the Class Descriptor file.

?? L-RECORD SHOULD NOT FOLLOW A PREASSIGNMENT

**Meaning:** An L record follows an AXM, ASM, or 5SM record in the Class Descriptor file.

**To correct:** Ensure that the extract program does not place L records after AXM, ASM, or 5SM records in the Class Descriptor file.

?? MORE THAN 385/256 FINISH TIMES HAVE BEEN SPECIFIED

**Meaning:** More than 385 (UNIX environment) or 256 (VMS environment) finish times have been specified in the Class Descriptor file.

**To correct:** Get your campus to adopt standard time blocks to minimize the number of finish times.
?? MORE THAN 54/256 FINISH WEEKS HAVE BEEN SPECIFIED

**Meaning:** More than 54 unique finish weeks or 256 unique end dates have been specified in the Class Descriptor file.

**To correct:** Check the finish week or end date information in your course master file, and reduce the number of unique finish weeks or end dates.

?? MORE THAN 192/128 START TIMES HAVE BEEN SPECIFIED

**Meaning:** More than 192 (UNIX environment) or 128 (VMS environment) unique start times have been specified in the Class Descriptor file.

**To correct:** Get your campus to adopt standard time blocks to minimize the number of unique start times, or request a special 96 start time version of SCHEDULE25 from Universal Algorithms.

?? MORE THAN 54/256 START WEEKS HAVE BEEN SPECIFIED

**Meaning:** More than 54 unique start weeks or 256 unique begin dates have been specified in the Class Descriptor file.

**To correct:** Check the start week or begin date information in your course master file, and reduce the number of unique start weeks or begin dates.

?? NO M-RECORD PRECEDES THIS RECORD

**Meaning:** There is an incorrectly coded record preceding this M record (probably a blank line in the file).

**To correct:** Check the record preceding the M record. Correct, remove, or reposition the record in the file as appropriate. Make sure the preceding record has a carriage return at the end of the record.

?? NO NUMBER IS ENTERED IN THE SIZE FIELD

**Meaning:** The size field in an M record is blank.

**To correct:** Ensure that the extract program is entering the correct class size or the default enrollment indicator in the Enrollment field of each Class Descriptor record.
?? NUMBER IS EITHER MIXED WITH OR FOLLOWED BY BLANKS IN THE SIZE FIELD

**Meaning:** The enrollment specified in a Class Descriptor record is not right-justified in the Size field.

**To correct:** Ensure that the extract program is right-justifying the entry in the Enrollment field of each Class Descriptor record.

?? ONE OF THE CHARACTERS IN THE M-RECORD WHICH FIGURES INTO CONFLICT DECISIONS IS NOT BLANK OR NUMERIC

**Meaning:** A non-numeric character appears in one of the columns of a Class Descriptor record from which a digit of the conflict decider is determined.

**To correct:** Ensure that the extract program is entering the correct numeric conflict deciders in each Class Descriptor record that specifies conflict deciders and that the Control file correctly defines each conflict decider column.

?? ONLY NUMERICS AND BLANKS ARE PERMITTED IN THE SIZE FIELD

**Meaning:** The Enrollment field of a Class Descriptor record contains something other than numerics or blanks.

**To correct:** Ensure that the extract program is entering only numerics, blanks, or the default enrollment indicator in the Enrollment field of each Class Descriptor record.

?? P-RECORD SHOULD NOT FOLLOW AN M-RECORD FOR A CLASS DESIGNATED AS SHARING A ROOM

**Meaning:** A P record follows an HSM or VSM record.

**To correct:** Ensure that the extract program does not place P records after HSM or VSM records in the Class Descriptor file.

?? P-RECORD SHOULD NOT FOLLOW A PREASSIGNMENT

**Meaning:** A P record follows an AXM, ASM, or 5SM record in the Class Descriptor file.

**To correct:** Ensure that the extract program does not place P records after AXM, ASM, or 5SM records in the Class Descriptor file.
RSM-RECORD HAS OVERLAPPING TIMES WITH THE PRECEDING M-RECORD

**Meaning:** An RSM record has the same or overlapping times with the NSM or 1SM record that precedes it in the Class Descriptor file. The RSM designation indicates that the class must be assigned to the same room as the preceding M record, *but not at the same time.*

**To correct:** Ensure that the data in the course master for this class is correct and that the extract program is entering the correct assignment code.

?? START AND/OR FINISH WEEK FIELD(S) CONTAIN(S) IMPROPER VALUE(S)

**Meaning:** The Start and/or Finish Week fields in a Class Descriptor record have one or more of these errors:

- The Start Week entry is greater than the Finish Week entry
- The Start Week or the Finish Week entry is zero
- The Finish Week entry is greater than the value of the Number of Weeks In Term entry in the Control file

**To correct:** Ensure that the start and finish weeks for this class are correct in the course master and that the extract program is entering the information correctly in the Class Descriptor file. Verify that the total date span encompassed by all classes does not exceed the Number of Weeks in Term defined in the Control file.

?? START WEEK FIELD IS IMPROPERLY CODED

**Meaning:** There is an invalid entry in the Start Week field of a Class Descriptor record.

**To correct:** Ensure that the extract program is correctly formatting the entry in the Start Week field.
?? THE 5-TYPE RECORD WITH WHICH THIS W-TYPE RECORD IS ASSOCIATED SPECIFIES A TIME CONFLICT...ASSIGNMENT WAS NOT MADE

**Meaning:** The 5SM (preassigned) record associated with this WSM (cross-listed) record requests a room and a time which are not open. No classes in the competing groups were assigned to the requested room.

**To correct:** Resolve the time conflict in the course master file.

?? THE CONTENTS OF THE NAME FIELD DO NOT MATCH ANY NAMES IN THE ROOM DATABASE

**Meaning:** The room name designated in an ASM, AXM, HSM, or VSM record is not in the `rooms.dat` file.

**To correct:** Ensure that the class was not included in the Class Descriptor file by mistake. If it should have been included in the extract, make sure the room specified is profiled in the `rooms.dat` file.

?? THE DAYS FIELD HAS NO DAYS ENTERED IN IT

**Meaning:** There is no entry in the Days field of a Class Descriptor record.

**To correct:** Ensure that the days specified in the course master for the class are correct and that the extract program is correctly entering them in the Days field. “TBA” is not a valid entry.

?? THE DAYS FIELD IS INCORRECTLY ENCODED

**Meaning:** The entry in the Days field of a Class Descriptor record is not a valid day abbreviation.

**To correct:** Ensure that the extract program is entering the correct, valid days abbreviations in the Days field of each Class Descriptor record. Verify that Control file records 4-10 correctly define the Day of Week abbreviations used at your campus.
?? THE FINISH HOUR IS NOT BETWEEN 1 AND 12

Meaning: The entry in the Finish Hour field of a Class Descriptor record is not a number between 1 and 12, although the A/P designator is ‘A’ (am) or ‘P’ (pm), indicating civilian time.

To correct: Ensure that the finish hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Hours field. Verify that record 14 of the Control file correctly defines the first column of the Finish Hours field.

?? THE FINISH HOUR IS NOT BETWEEN 0 AND 24

Meaning: The entry in the Finish Hour field of a Class Descriptor record is not a number from 0 - 24, although the A/P designator is ‘H’, indicating military time.

To correct: Ensure that the finish hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Hours field. Verify that record 14 of the Control file correctly defines the first column of the Finish Hours field.

?? THE FINISH HOURS FIELD CONTAINS NON-NUMERIC(S)

Meaning: There are non-numeric characters in the Finish Hours field of a Class Descriptor record.

To correct: Ensure that the finish hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Hours field. Verify that record 14 of the Control file correctly defines the first column of the Finish Hours field.

?? THE FINISH MINUTES EXCEED 59

Meaning: A number greater than 59 appears in the Finish Minutes field of a Class Descriptor record.

To correct: Ensure that the finish minute information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Minutes field.
?? THE FINISH MINUTES FIELD CONTAINS NON-NUMERIC(S)

**Meaning:** There are non-numeric characters in the Finish Minutes field of a Class Descriptor record.

**To correct:** Ensure that the finish minute information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Minutes field. Verify that record 15 of the Control file correctly defines the first column of the Finish Minutes field.

?? THE FINISH TIME SPECIFIED IS EARLIER THAN XXXX

**Meaning:** The Finish Time entry for a class is earlier than the earliest start time specified in the Control file.

**To correct:**

- Ensure that the finish hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Hours and Finish Minutes fields.
- Verify the earliest start time entry in record 35 of the Control file.

?? THE FINISH TIME SPECIFIED IS LATER THAN YYYY

**Meaning:** The Finish Time entry for a class is later than the latest finish time specified in the Control file.

**To correct:**

- Ensure that the finish hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Finish Hours and Finish Minutes fields.
- Verify the latest finish time entry in record 36 of the Control file.
?? THE H-TYPE RECORD WITH WHICH THIS V-TYPE RECORD IS ASSOCIATED SPECIFIES A TIME CONFLICT...ASSIGNMENT WAS NOT MADE

**Meaning:** The HSM (preassigned) record associated with this VSM (cross-listed) record requests a room and a time which are not open. No classes in the competing groups were assigned to the requested room.

**To correct:** Resolve the conflict in the class descriptor file.

?? THE START HOUR FIELD CONTAINS NON-NUMERIC(S)

**Meaning:** There are non-numeric characters in the Start Hours field of a Class Descriptor record.

**To correct:** Ensure that the start hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Hour field. Verify that record 12 of the Control file correctly defines the first column of the Start Hours field.

?? THE START HOUR IS NOT BETWEEN 1 AND 12

**Meaning:** The entry in the Start Hour field is not a number between 1 and 12, although the A/P designator is ‘A’ (am) or ‘P’ (pm), indicating civilian time.

**To correct:** Ensure that the start hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Hour field. Verify that record 12 of the Control file correctly defines the first column of the Start Hours field.

?? THE START HOUR IS NOT BETWEEN 0 AND 24

**Meaning:** The entry in the Start Hour field is not a number between 0 and 24, although the A/P designator is ‘H’, indicating military time.

**To correct:** Ensure that the start hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Hour field. Verify that record 12 of the Control file correctly defines the first column of your Start Hours field.
?? THE START MINUTES EXCEED 59

**Meaning:** A number greater than 59 appears in the Start Minutes field of a Class Descriptor record.

**To correct:** Ensure that the start minute information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Minutes field.

?? THE START MINUTES FIELD CONTAINS NON-NUMERIC(S)

**Meaning:** There are non-numeric characters in the Start Minutes field of a Class Descriptor record.

**To correct:** Ensure that the start minute information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Minutes field. Verify that record 13 of the Control file correctly defines the first column of the Finish Minutes field.

?? THE START TIME SPECIFIED IS EARLIER THAN XXXX

**Meaning:** The Start Time entry for a class is earlier than the earliest start time specified in the Control file.

**To correct:**
- Ensure that the start hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Hours and Start Minutes fields.
- Verify the earliest start time entry in record 35 of the Control file.

?? THE START TIME SPECIFIED IS LATER THAN YYYY

**Meaning:** The Start Time entry for a class is later than the latest finish time specified in the Control file.

**To correct:**
- Ensure that the start hour information for this class is correct in the course master and that the extract program is correctly entering the information in the Start Hours and Start Minutes fields.
- Verify the latest finish time entry in record 36 of the Control file.
?? THERE IS NO H-TYPE RECORD WHICH HAS THE SAME DAYS, TIME, START/FINISH WEEK, AND ROOMNAME AS THIS V-TYPE RECORD

**Meaning:** There is no HSM record with the same placement request as this VSM record. Either the HSM record has not been included in the Class Descriptor file or the class information in it is different from its associated VSM record.

**To correct:** Ensure that the class information is correct in the course master and that the information has been entered correctly in the Class Descriptor file.

?? THERE IS NO V-TYPE RECORD WHICH HAS THE SAME DAYS, TIME, START/FINISH WEEK, AND ROOMNAME AS THIS H-TYPE RECORD

**Meaning:** There is no VSM record with the same placement request as this HSM record. Either the VSM record has not been included in the Class Descriptor file or the class information in it is different from its associated HSM record.

**To correct:** Ensure that the class information is correct in the course master and that the information has been entered correctly in the Class Descriptor file.

?? THESE CLASSES INDICATE A TIME CONFLICT...ASSIGNMENT TO THE FIRST ONE NOT MADE

**Meaning:** Two classes have been preassigned (ASM, HSM) to the same room at the same or overlapping times. The second class listed received the preassignment. The first class listed was not assigned to that or any room.

**To correct:** Resolve the time conflict in the course master file.

?? THIS (P/L) RECORD IS NOT PROPERLY CODED

**Meaning:** The syntax of a P or L record is not correct.

**To correct:** Ensure that the extract program is entering the correct syntax for P and L records in the Class Descriptor file.
**?? THIS RECORD IS NOT PROPERLY CODED**

**Meaning:** Either the entry in column 80 of a Class Descriptor record is not ‘M’, ‘P’, or ‘L’, or a P or L record is not properly coded.

**To correct:** Ensure that the extract program is placing ‘M’, ‘P’, or ‘L’ in column 80 or each Class Descriptor record and that it is entering the correct syntax for P and L records. Make sure there is a carriage return at the end of every record.

**?? THIS XXX-RECORD IGNORED...DOES NOT IMMEDIATELY FOLLOW THE 1 OR N RECORD**

**Meaning:** A P or L record does not immediately follow its associated 1 or N record in the Class Descriptor file, so it has not been processed.

**To correct:** Ensure that the information for this class is in the course master and that it is correct. Ensure that the extract program is entering the P and L records correctly in the Class Descriptor file.

**?? TOO MANY UNIQUE START TIMES HAVE BEEN SPECIFIED**

**Meaning:** There are too many unique start times specified in the Class Descriptor file, so the compression technique that is used to compress the number of intervals to 64 or less cannot work.

**To correct:** Get your campus to adopt standard time blocks to minimize the number of unique start times, or request a special 96 start time version of SCHEDULE25 from Universal Algorithms.

**?? VALID M-RECORD DOES NOT PRECEDE THIS XXX-RECORD**

**Meaning:** An invalid M record precedes this record.

- WSM records can only be preceded by NSM, 1SM, or 5SM records
- RSM records can only be preceded by NSM or 1SM records
- RXM records can only be preceded by NXM or 1XM records
- VSM records can only be preceded by HSM records

**To correct:** Ensure that the information for this class in the course master is correct. Ensure that the extract program is entering the class correctly in the Class Descriptor file.
?? VSM-RECORD DOES NOT HAVE THE SAME BEGIN DAY AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same begin day as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room at the same time and dates as the preceding M record.

**To correct:** Ensure that the begin day in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? VSM-RECORD DOES NOT HAVE THE SAME BEGIN MONTH AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same begin month as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room at the same time and dates as the preceding M record.

**To correct:** Ensure that the begin month in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? VSM-RECORD DOES NOT HAVE THE SAME DAYS-OF-WEEK AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same meeting days of the week as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room at the same time and days as the preceding M record.

**To correct:** Ensure that the meeting days in the course master for this class are correct and that the extract program is entering the correct information in the Class Descriptor file.
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?? VSM-RECORD DOES NOT HAVE THE SAME END DAY AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same end day as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the end day in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? VSM-RECORD DOES NOT HAVE THE SAME END MONTH AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same end month as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the end month in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? VSM-RECORD DOES NOT HAVE THE SAME FINISH WEEK AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same finish week as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the finish week in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.
?? VSM-RECORD DOES NOT HAVE THE SAME START AND FINISH TIMES AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same start and finish times as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room at the same time and dates as the preceding M record.

**To correct:** Ensure that the start and finish times in the course master for this class are correct and that the extract program is entering the correct information in the Class Descriptor file.

?? VSM-RECORD DOES NOT HAVE THE SAME START WEEK AS THE PRECEDING M-RECORD

**Meaning:** This VSM record does not have the same start week as the HSM record that precedes it in the Class Descriptor file. The VSM designation indicates that the class must be assigned to the same room at the same time and dates as the preceding M record.

**To correct:** Ensure that the start week in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WARNING...TIME SPAN SPECIFIED INCLUDES MIDNIGHT

**Meaning:** The time span specified in a Class Descriptor record spans midnight. It may mean that the start and finish times of the class were accidentally transposed.

**To correct:** Correct the start and/or finish times for the class in the course master file.
?? WEEK SPAN XXX TO XXX EXCEEDS LIMIT SPECIFIED IN CONTROL FILE

**Meaning:** The week (date) span specified by all records in the Class Descriptor file is greater than the Number of Weeks in Term defined in the Control file.

**To correct:**

- Ensure that the week (date) span specified in the course master for each class is correct and that the extract program is entering the information correctly in the Class Descriptor file.
- Verify the Number of Weeks in Term parameter entry in the Control file. It can always be larger than the actual number of weeks in the term you are scheduling.

?? WSM-RECORD DOES NOT HAVE THE SAME BEGIN DAY AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same begin day as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the begin day in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME BEGIN MONTH AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same begin month as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the begin month in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.
?? WSM-RECORD DOES NOT HAVE THE SAME DAYS-OF-WEEK AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same meeting days of the week as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the meeting days in the course master for this class are correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME END DAY AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same end day as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the end day in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME END MONTH AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same end month as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the end month in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.
?? WSM-RECORD DOES NOT HAVE THE SAME FINISH WEEK AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same finish week as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the finish week in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME START AND FINISH TIMES AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same start and finish times as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the start and finish times in the course master for this class are correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME START WEEK AS THE PRECEDING M-RECORD

**Meaning:** This WSM record does not have the same start week as the NSM or 1SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room *at the same time and dates* as the preceding M record.

**To correct:** Ensure that the start week in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.
?? WSM-RECORD FOLLOWING 5SM-RECORD DOES NOT HAVE THE SAME ROOM NAME

Meaning: This WSM record does not have the same room name as the 5SM record that precedes it in the Class Descriptor file. The WSM designation indicates that the class must be assigned to the same room at the same time and dates as the preceding M record.

To correct: Ensure that the room name in the course master for this class is correct and that the extract program is entering the correct information in the Class Descriptor file.

?? WSM-RECORD DOES NOT HAVE THE SAME SIZE AS THE PRECEDING M-RECORD

Meaning: This WSM record does not have the same enrollment as the preceding NSM record.

To correct: Ensure that the enrollments of all records in the NSM/WSM group are the same.
Diagnostic Messages
Appendix
File Maintenance For Schedulers

Introduction

As part of your scheduling job, you may occasionally have to perform simple operating system tasks such as copying, renaming, moving, or concatenating files and doing simple file editing. This appendix shows the syntax of the file commands you’re most likely to use in UNIX and VMS environments, and tells how to get information about editing tools.
Basic UNIX operating system commands

[ ] material within brackets is optional.

{ } material within braces is required.

| indicates an alternative. Only one or the options can be chosen.

... indicates that one or more of the kinds of objects preceding the ellipsis can be entered.

<table>
<thead>
<tr>
<th>Command</th>
<th>What command does</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **cat [File...]** | Displays or concatenates files. | cat sortdp.dat  
Displays the sortdp.dat file.  
cat sortrm.dat losers.dat> datain.dat  
Concatenates the sortrm.dat and losers.dat files into datain.dat |
| **cd [Directory]** | Changes current directory. | cd  
Changes to $HOME directory.  
cd ..  
Changes to parent directory of current directory.  
cd sched25  
Changes to the sched25 subdirectory of the current directory. |
| **chmod <num> File.../Directory...** | Changes file or directory permission modes in numerical form.  
7=read,write,execute/search  
6=read, write  
5=read, execute/search  
4=read  
1=execute/search  
0=no privileges  
Execute - files  
Search - directories | chmod 0760 phys.dat  
Grants read/write/execute permission to the owner of the phys.dat file, read/write permission to the group, and no permissions to all others. |
<table>
<thead>
<tr>
<th>Command</th>
<th>What command does</th>
<th>Examples</th>
</tr>
</thead>
</table>
| `ls [-a -d -l] [File...] [Directory...]` | Lists directory contents.  
  `-a` (lists all directory contents including hidden files)  
  `-d` (lists information about a directory, not its files)  
  `-l` (lists directory contents in long form) | `ls -l`  
Lists information about the files in the current directory, including permissions  
`ls -d`  
Lists information about the current directory, including permissions |
| `mkdir Directory...` | Creates a directory | `mkdir fall97`  
Makes a directory called `fall97`. |
| `mv [ -i -f ] {{ File... Directory...} Directory} | Moves or renames files and directories | `mv sortrm.dat datain.dat`  
Renames the `sortrm.dat` file to `datain.dat`.  
`mv fall97 sched25`  
Makes the `fall97` directory a subdirectory of the `sched25` directory. If a `sched25` directory doesn’t exist, renames the `fall97` directory `sched25`.  
`mv sortrm.dat fall97/fall97.dat`  
Moves the `sortrm.dat` file to the `fall97` directory, and renames it `fall97.dat`. The `fall97` directory must already exist. |
| `pg [ File...]` | Displays a file, one page at a time. | `pg runs25.com`  
Displays the `runs25.com` file one page at a time. |
| `pwd` | Displays pathname of your current directory. | `pwd` |
Basic VMS operating system commands

[ ] material within brackets is optional.

{ } material within braces is required.

| indicates an alternative. Only one or the options can be chosen.

... indicates that one or more of the kinds of objects preceding the ellipsis can be entered.

<table>
<thead>
<tr>
<th>Command</th>
<th>What command does</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPEND File...&gt;&gt;File</td>
<td>Appends files to other files</td>
<td>APPEND LOSERS.DAT&gt;&gt;SORTRM.DAT Appends the losers.dat file to the sortrm.dat file</td>
</tr>
<tr>
<td>CREATE/DIR Directory</td>
<td>Creates a directory</td>
<td>CREATE/DIR FALL97 Makes a directory called FALL97.</td>
</tr>
<tr>
<td>DIR/ [FULL] [VERSIONS=] [EXCLUDE=] [PROTECTION] [SIZE=] [DATE=created</td>
<td>modified]</td>
<td>Lists directory contents. FULL (lists a full page of information for each file) VERSIONS= (lists information about the file version(s) specified only) EXCLUDE= (lists information about all files except those specified) PROTECTION (shows directory or file protections) SIZE= (shows file sizes) DATE= (lists date file was created or last modified depending on which is specified)</td>
</tr>
<tr>
<td>RENAME {File}</td>
<td>Renames files and directories</td>
<td>RENAME SORTRM.DAT DATAIN.DAT Renames the sortrm.dat file to datain.dat.</td>
</tr>
<tr>
<td>{Directory} NewName</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A-4  ♦  SCHEDULE25 User’s Guide
<table>
<thead>
<tr>
<th>Command</th>
<th>What command does</th>
<th>Examples</th>
</tr>
</thead>
</table>
| **SET PROTECTION**  
  =<group><permissions>  
  File|Directory | Changes file or directory protections.  
  S=system  
  O=owner  
  G=group  
  W=world  
  R=read  
  W=write  
  E=execute  
  D=delete | SET PROTECTION=  
  (S:RWED,O:RWED,G:RWD,W:)  
  PHYS.DAT  
  Grants these file protections for the  
  phys.dat file: read/write/execute/delete  
  permission to the system,  
  read/write/execute permission to the  
  owner, read/write permission to the  
  group, and no permission to all others. |
| **TYPE**   
  /[PAGE] [ File] | Displays a file. | TYPE/PAGE RUNS25.COM  
  Displays the runs25.com file one page at  
  a time. |
File editing tools

As described earlier in this manual, there may be times before or after a SCHEDULE25 run when you need to edit SCHEDULE25 input or output files. The table below indicates the types of editing tools available and how to get more information about them.

<table>
<thead>
<tr>
<th>To get information about...</th>
<th>Do this...</th>
</tr>
</thead>
<tbody>
<tr>
<td>File editors or word processors</td>
<td>See what’s available on your campus host computer or on your PC.</td>
</tr>
<tr>
<td>Shareware</td>
<td>Call Universal Algorithms for a list of current shareware providers. Several schools have developed host-based and PC-based interfaces to the Campus Profile files.</td>
</tr>
<tr>
<td>Third party suppliers</td>
<td>Call Universal Algorithms for a list of current suppliers and product costs. Universal Algorithms certifies independent suppliers who have developed tools for editing the Class Descriptor and Campus Profile files.</td>
</tr>
</tbody>
</table>

Universal Algorithms phone number is (503) 973-5200.
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We welcome your comments and suggestions. Please complete this form to let us know of any errors in the SCHEDULE25 User’s Guide or any suggestions you have for improving the manual or the software.

**General Evaluation** (circle one response to each statement):

- The instructions were easy to follow.
  - Strongly Agree
  - Agree
  - No Opinion
  - Disagree
  - Strongly Disagree
  - If not, why? ________________________________________________________________

- The information was complete.
  - Strongly Agree
  - Agree
  - No Opinion
  - Disagree
  - Strongly Disagree
  - If not, why? ________________________________________________________________

- The information was easy to find.
  - Strongly Agree
  - Agree
  - No Opinion
  - Disagree
  - Strongly Disagree
  - If not, why? ________________________________________________________________

- This book was useful to me.
  - Strongly Agree
  - Agree
  - No Opinion
  - Disagree
  - Strongly Disagree
  - Why? Why not? _______________________________________________________________

**Check:**

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- Suggestion(s) for revisions to the manual
- Suggested change(s) to the software

**Your comments** (including page number(s), if applicable):

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Margo Pardee, Documentation Specialist
Universal Algorithms, Inc.
Suite 100
One S.W. Columbia
Portland, OR 97258-2078

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