

T I M E T A B L I N G



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Introduction

The timetabling application has been designed as a tool to assist schedule managers build class timetables that best meet student course demand while working within the limitations of room availability and instructor time constraints. It is intended to help you take all of the important restrictions on location and time placement into account as you create the class timetable for a semester. It is also able to test multiple possible solutions far more quickly than can be done manually.

The solver described in this manual is the core of the timetabling application. Based on the course structure data and instructional requirements input for all of the classes you wish to offer, it determines possible time and room assignments and then evaluates how well preferences are met for each possible placement. Depending on your needs, the solver can either create a completely new timetable from the input data you enter, modify an established timetable, or help create a hybrid somewhere in between.

There are three basic steps involved in using the solver. The first is to **Load** all of the data you have entered about your classes, rooms, and preferences into the solver's memory. This data normally resides in a database. During the load process, checks are performed for inconsistencies in the input data or missing data on classes that is required by the solver. The second step is running the solver in the **Check** configuration. Here the solver ignores any preferences entered (i.e., strongly discouraged to strongly preferred) and only checks if it is possible to find a solution that meets all of the problem requirements (e.g., classes taught by a single instructor do not overlap, more classes required at a single time than possible). The final step is to **Optimize** the solution. During this phase the solver considers all preferences and goes through many iterations to maximize the degree to which they are met.

After a solution is found, it is also possible to modify the time and room assignments of individual classes using the solver in an interactive mode. This allows you to make any adjustments you may feel are necessary. The intent is for you to remain in control of your final timetable.

1. Load Input Data
 - a. Set solver configuration to “Check.” Click “Load”.
 - b. Upon “Awaiting commands...” refresh screen.
 - c. Review any warning messages to make sure that input data is consistent and all classes you wish to timetable are successfully loaded into solver.
 - d. Follow links to classes and make any necessary changes to input data.
 - e. Unload.

2. Check for Complete Feasible Solution
 - a. If no unacceptable warnings, set solver configuration to “Check.” Start solver.
 - b. Upon “Awaiting commands...” refresh screen. Check percentage of variables assigned.
 - c. If less than 100% of variables assigned, look at list of non-assigned classes. Select class of interest and check conflict statistics on Suggestions page.
 - d. Make any necessary changes to input data and unload.

3. Optimize Timetable
 - a. Set solver configuration to “Default.” Load corrected input data.
 - b. Upon “Awaiting commands...” refresh screen. Check for any problems. If no problems, start solver.
 - c. Allow solver to run to 30-minute timeout. (If you choose to stop early, click on “Student Sectioning” and refresh again.)

4. Review Solution Properties, Summary Reports, and Timetables
 - a. Look over solution properties on Solver screen.
 - b. For more details consult “Reports” section of sidebar menu.
 - c. View “Timetable” on sidebar menu to see time grids.
 - d. Any necessary changes to timetable (except breaking hard constraints) can be made by selecting a class and choosing an alternate assignment from the Suggestions pop-up screen. Changes are not made until the “Assign” button is clicked.

5. Save the Timetable
 - a. On Solver screen, save current solution to best if any changes have been made (click on “Save to Best” button). Save best timetable by selecting “Save as New.” Alternatively solution can be saved using the “Save as New” button on the Timetables screen.
 - b. Later changes (including breaking hard constraints) can be made to a saved timetable by loading the saved timetable into the Interactive Solver from the Timetables screen.

6. Commit Timetable

Timetabling Manual – Solver

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To use the solver, start by clicking on Solver in the left hand side menu (under Timetables).

TIMETABLING

System Messages

Hello Timetabling Users,

The calendar of Timetabling related activities is as follows:

- October - SMAS Departmental Training.
- November - Schedule Deputies will start working with Fall 2007 data to perform beta testing and to learn how to work with the interactive solver.
- December - Schedule Deputies will start entering LLR requests.
- January - LLR requests are due.
- February - Departmental data is due. LAB requests will be solved after the departments create their timetables.

SMAS

Current User | **Solver Status**

Name	DEBRA L WINGER (4)
Dept	1364

1. Check input data consistency

(“Check” configuration of the solver)

1. Set the solver configuration to “Check,” leave other parameters as they are.
2. Click Load.

Solver

Status: Solver not started.

Solver configuration: Check

Solver mode: Initial

When finished: No Action

Allow breaking of hard constraints:

Student final sectioning:

Owner: Psychology

Load Start Refresh

Current Timetable

No timetable is selected or loaded.

Current User: Solver Status
Name: DEBRA L WINGER (A)
Dept: 1364
Role: Dept Sched Mgr

3. The status of operations being performed by the solver can be seen in the frame in the lower left hand corner of the screen. When the solver is started, the Solver Status will automatically be displayed. The status is updated every 5 seconds.

Solver

Status: Solver not started.

Solver configuration: Check

Solver mode: Initial

When finished: No Action

Allow breaking of hard constraints:

Student final sectioning:

Owner: Psychology

Refresh

Current Timetable

Assigned variables:	0.00% (0/0)
Overall solution value:	0.00
Time preferences:	100.00% (0.00)
Student conflicts:	0 [committed:0, distance:0, hard:0]
Room preferences:	100.00% (0)
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	100.00% (0)
Too big rooms:	0.00% (0)

Current User: Solver Status
Owner: C. Stump as PSY
Host: local
Solver: Student Sectioning...
Phase: Done
Progress: 1 of 1 (100.0%)
Version: 2.4.2

- When the solver status is “Awaiting commands...,” click Refresh in the Solver screen.

The screenshot shows the Solver interface with the following details:

- Left Panel (Tree View):**
 - Input Data
 - Instructional Offerings
 - Classes
 - Instructors
 - Designator List
 - Rooms
 - Features
 - Groups
 - Distribution Preferences
 - Reservations
 - Class Assignments
 - Timetables
 - Solver
 - Timetable
 - Assigned
 - Not-assigned
 - Changes
 - History
 - Conflict Statistics
- Bottom Panel (Status):**
 - Current User: Solver Status
 - Owner: C. Stump as PSY
 - Host: local
 - Solver: **Awaiting commands...** (circled in red)
 - Phase: Progress
 - Version: 2.4.2
- Main Panel (Solver Configuration):**
 - Solver**
 - Status: Awaiting commands...
 - Solver configuration: Check
 - Solver mode: Initial
 - When finished: No Action
 - Allow breaking of hard constraints:
 - Student final sectioning:
 - Owner: Psychology
 - Refresh** (button circled in red)
- Current Timetable**
 - Assigned variables: 0.00% (0/0)
 - Overall solution value: 0.00
 - Time preferences: 100.00% (0.00)
 - Student conflicts: 0 [committed:0, distance:0, hard:0]
 - Room preferences: 100.00% (0)
 - Distribution preferences: 100.00% (0)
 - Back-to-back instructor preferences: 100.00% (0)
 - Too big rooms: 0.00% (0)

This is the resulting screen.

The screenshot shows the Solver interface with the following details:

- Left Panel (Tree View):** (Same as above)
- Bottom Panel (Status):**
 - Current User: Solver Status
 - Owner: C. Stump as PSY
 - Host: local
 - Solver: **Awaiting commands...** (circled in red)
 - Phase: Progress
 - Version: 2.4.2
- Main Panel (Solver Configuration):**
 - Solver**
 - Input data loaded: 10/17/06 11:04AM
 - Status: Awaiting commands ...
 - Solver configuration: Check
 - Solver mode: Initial
 - When finished: No Action
 - Allow breaking of hard constraints:
 - Student final sectioning:
 - Owner: Psychology
 - Buttons: Start, Student Sectioning, Reload Input Data, Unload, Export Solution, Refresh
- Current Timetable**
 - Assigned variables: 42.71% (41/96)
 - Overall solution value: 0.00
 - Time preferences: 100.00% (0.00)
 - Student conflicts: 7 [committed:7, distance:0, hard:0]
 - Room preferences: 0.00% (0)
 - Distribution preferences: 100.00% (0)
 - Back-to-back instructor preferences: 100.00% (0)

5. Scroll down on the **Solver** screen to the last section. If there have been any problems loading class data, a list of warnings will be displayed. For detailed warning descriptions see Appendix A.

Distribution preferences: 100.00% (0)
 Back-to-back instructor preferences: 100.00% (0)
 Too big rooms: 0.00% (0)
 Useless half-hours: 0.10% (2 + 57)
 Same subpart balancing penalty: 0.00
 Time: 0.00 sec
 Iteration: 0
 Memory usage: 263.84M

Problems

WARNING: Class [PSY 120H Lec 2](#) has no available placement.
 WARNING: Class [PSY 391 Ind 1](#) has no time pattern selected.
 WARNING: Class [PSY 391H Ind 1](#) has no time pattern selected.
 WARNING: Class [PSY 615 Lec 1](#) has no time pattern selected.
 WARNING: Class [PSY 678B Clin 1](#) has no time pattern selected.
 WARNING: Class [PSY 679D Expr 1](#) has no time pattern selected.
 WARNING: Class [PSY 696 Lec 1](#) has zero expected students.
 WARNING: Same room and overlapping time required:
[PSY 580 Lec 1](#) ← TTh 9:00a - 10:15a Full Term PSYC 3187 MOHR, DONALD M
[PSY 522 Lec 1](#) (id:159647) ← T 9:30a - 10:20a Full Term PSYC 3187 HANNEMANN, ROBERT E
 WARNING: Same instructor and overlapping time required:
[PSY 678B Lec 1](#) ← Th 10:30a - 11:20a Full Term PSYC 1160 MERRITT, REBECCA D
[PSY 679C Clin 1](#) ← Th 9:00a - 10:50a Full Term PSYC 1160 MERRITT, REBECCA D
 WARNING: Same room and overlapping time required:
[PSY 678B Lec 1](#) ← Th 10:30a - 11:20a Full Term PSYC 1160 MERRITT, REBECCA D
[PSY 679C Clin 1](#) (id:159681) ← Th 9:00a - 10:50a Full Term PSYC 1160 MERRITT, REBECCA D

6. Make any necessary changes to the input data to address problems described in the warning messages -- such as a class with no time pattern selected. Clicking on the underlined class will take you to the **Class Detail** screen where you can fix these problems. You can return to the **Solver** screen by clicking on Solver in the left hand side menu.

Class Detail

[PSY 391 Ind 1](#) [Edit Class](#) [Add Distribution Preference](#) [Add Reservation](#) [Previous](#) [Next](#)

Manager: 1364 - Psychological Sciences
 Number of Rooms: 0
 Date Pattern: Default (Full Term)
 Display Instructors:
 Display In Schedule Book:
 Schedule Print Note:
 Requests / Notes: Arrange hours and credits. Designator required.

Preferences

Required Strongly Preferred Preferred Neutral Discouraged Strongly Discouraged Prohibited

[Edit Class](#) [Add Distribution Preference](#) [Add Reservation](#) [Previous](#) [Next](#)

7. When all problems have been corrected, you should return to the top of the **Solver** screen and click on the Unload button. This unloads the previous input data (that you have just changed using the Class Detail or other screens).

The screenshot shows the Solver application window. On the left is a tree view with categories like Input Data, Rooms, Timetables, and Solver. The main area is titled 'Solver' and contains the following information:

- Input data loaded: 10/17/06 11:04AM
- Status: Awaiting commands ...
- Solver configuration: Check
- Solver mode: Initial
- When finished: No Action
- Allow breaking of hard constraints:
- Student final sectioning:
- Owner: Psychology

At the bottom of the Solver section, there are several buttons: Start, Student Sectioning, Reload Input Data, Unload, Export Solution, and Refresh. The Unload button is circled in red.

Below the Solver section is the 'Current Timetable' section with the following data:

Assigned variables:	42.71% (41/96)
Overall solution value:	0.00
Time preferences:	100.00% (0.00)
Student conflicts:	7 [committed:7, distance:0, hard:0]
Room preferences:	0.00% (0)
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	100.00% (0)

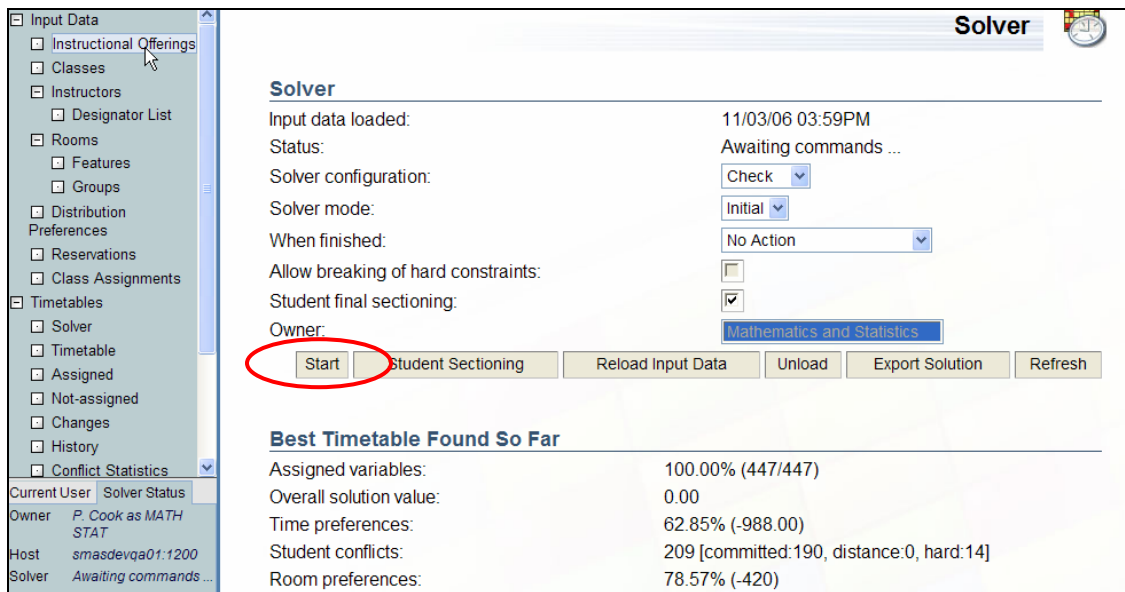
8. Repeat steps 1 through 7 until all unacceptable warnings are resolved. **Note** - these warnings are described in Appendix A. If a warning message says class not loaded this class will not be in your timetable.

2. Search for a complete timetable

Once checking for data consistency is complete and all warnings or errors are addressed, you can be sure that all classes will be included when you load data into the solver. Remember, if this is not the case and you ignored a warning, the solver may not load this class and a time and room will not be found for this class. See appendix A for more details.

In this phase we are looking for a complete feasible solution to the problem but that does not yet consider any preferences. This means that the solver ignores any preferences entered (i.e., strongly discouraged to strongly preferred) and only checks if it is possible to find a solution that meets all of the problem requirements (e.g., classes taught by a single instructor do not overlap, more classes required at a single time than possible).

1. Do steps 1 through 5 from the previous section.
2. If no unacceptable warnings appear, click Start.

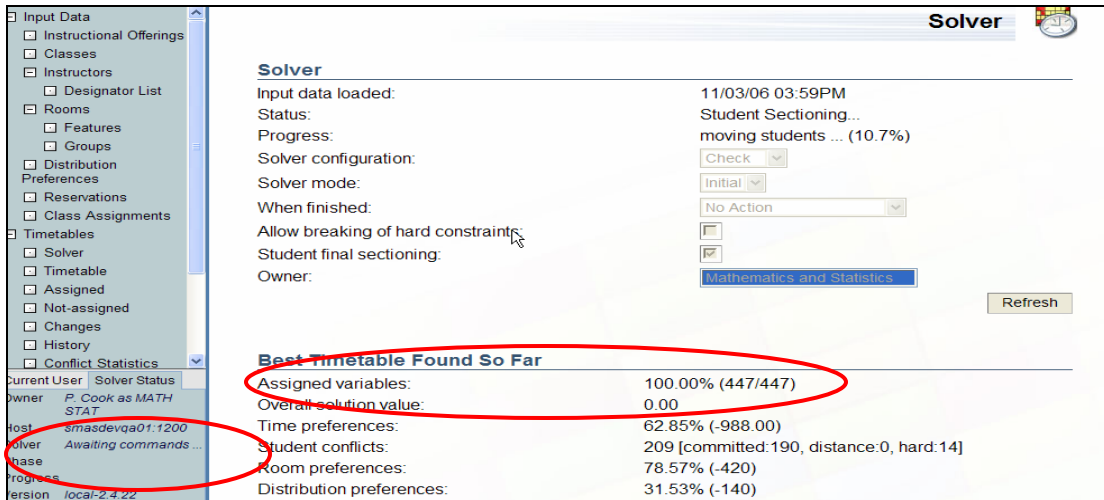


The screenshot shows the Solver application interface. On the left is a tree view of the data structure, including 'Input Data', 'Instructional Offerings', 'Classes', 'Instructors', 'Rooms', 'Features', 'Groups', 'Distribution Preferences', 'Reservations', 'Class Assignments', 'Timetables', 'Solver', 'Timetable', 'Assigned', 'Not-assigned', 'Changes', 'History', and 'Conflict Statistics'. The 'Start' button is circled in red. The main area displays the Solver status and configuration options.

Best Timetable Found So Far	
Assigned variables:	100.00% (447/447)
Overall solution value:	0.00
Time preferences:	62.85% (-988.00)
Student conflicts:	209 [committed:190, distance:0, hard:14]
Room preferences:	78.57% (-420)

We recommend running the solver for a few minutes.

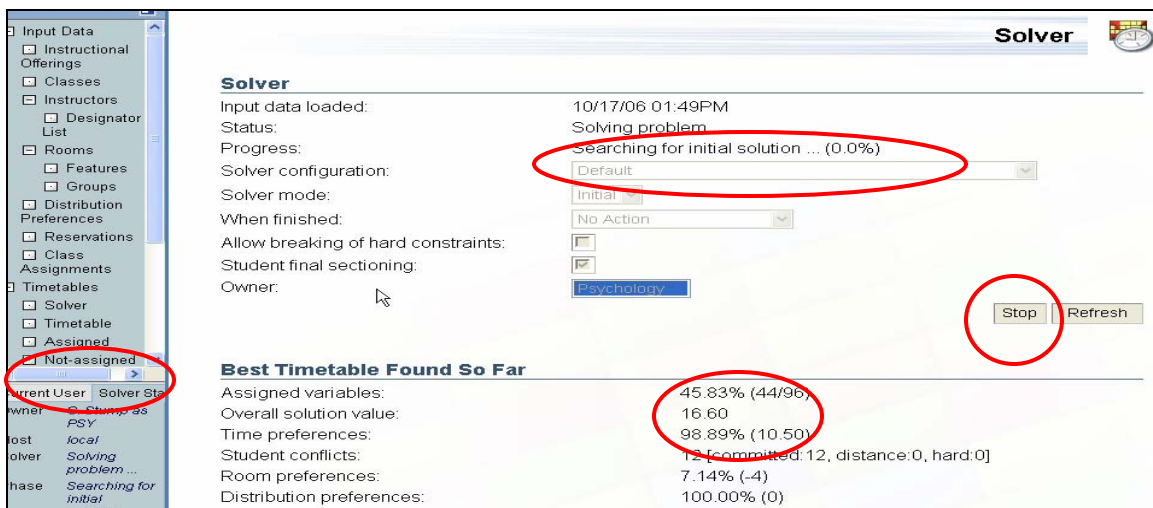
3. Check the **Solver Status** window in the lower left hand corner.
 - If it says “Awaiting commands...” within a few minutes of run time, click the Refresh button on the **Solver** screen. Look at the line labeled Assigned Variables.
 - a. If it says 100%, it means that a complete but not yet optimized timetable has been found. You can then Unload and proceed with creating an optimized timetable (section 3 of this manual).
 - b. If it is not at 100%, see below.



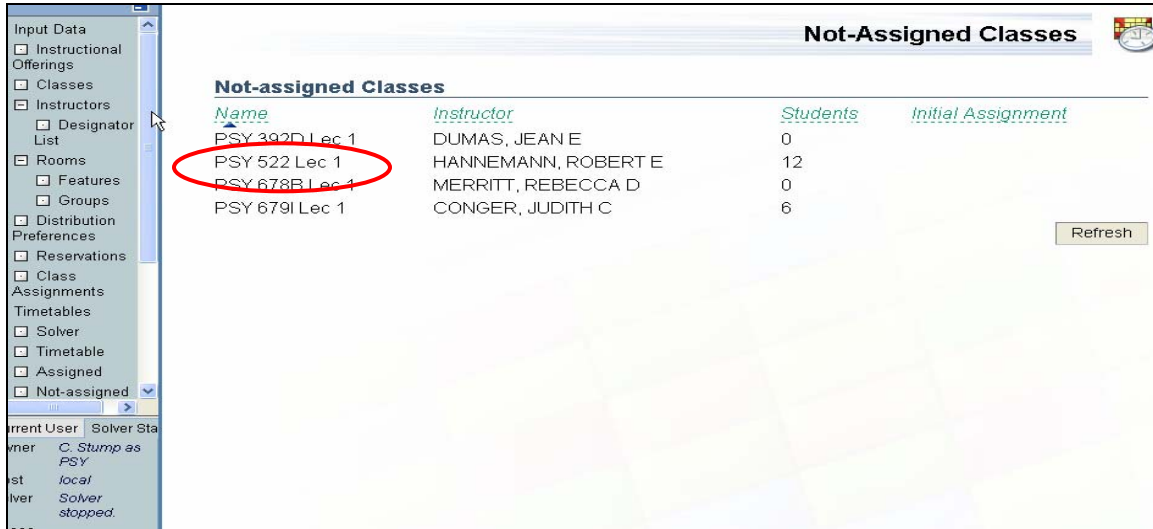
If you do wish to stop the solver while the Solver Status still displays “Searching for initial solution...,” click Stop in the **Solver** screen.

If the solver is not able to find a complete solution (assigned variables is below 100%), there is likely to be some problem with the input data preventing a solution from being found. The following steps will help determine what the problem is.

4. Click on Not-assigned in the left hand side menu.

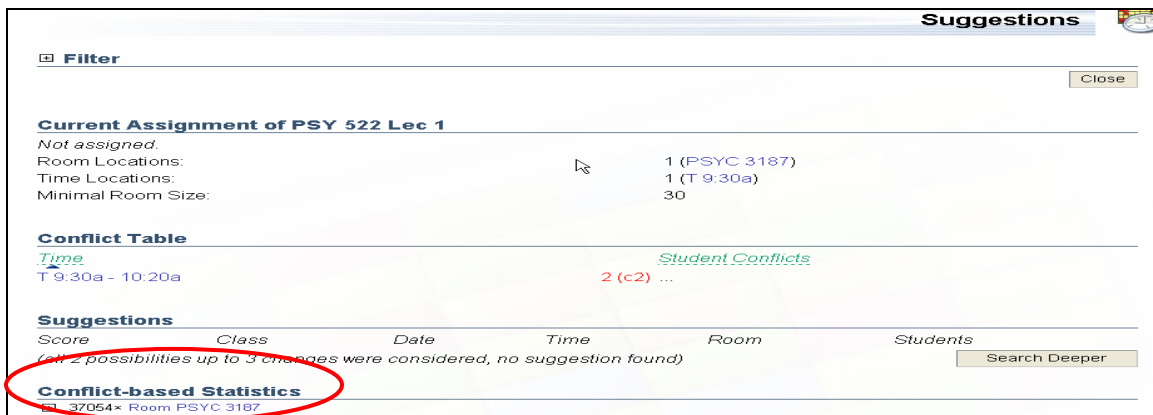


5. In the **Not-Assigned Classes** screen that shows up there is a list of classes for which the solver could not find a room and time. There could be many reasons for that. The most straightforward way to search for the reason is to;
 - a. Click on a class from the list.



The **Suggestions** screen will open in a new window.

- b. Scroll down to the last part of the **Suggestions** screen labeled Conflict-based Statistics. This is a record of the conflicts created during the solver's attempts to assign possible rooms and times to the class (i.e., other class assignments that were incompatible) and the reasons for these conflicts. These reasons correspond to violations of various constraints on the problem (e.g., two classes requiring a single instructor at the same time, or three classes requiring the same time when only two rooms are available). Typically these conflicts are caused by too many classes competing over a fixed resource. The statistics can help point out the constraining resource, or an overly restrictive requirement, so that changes can be made to the input data which allow the problem to be solved.



- c. Each line in the conflict-based statistics table contains a number indicating how many times a conflict occurred and the constraint that was in contention. Clicking on the small plus sign at the beginning of the line will provide an expanded breakdown of the conflicts for this constraint. Continue opening lines with large numbers of conflicts until you have a line with a small dot rather than a plus sign. These lines indicate the classes with which your unassigned class was competing over a constraint. If this clash reminds you of something that you did not set up, change the input data, and then continue from part one of this manual again. (**Tip** - you should check all your unassigned classes and make appropriate changes to the input data before you go back to part one of this manual – do not make changes to one class only and go back if your list is longer than one class). If you don't know what the problem is with this class, contact SMAS, and we will look into that with you. Do not **Unload** before calling.

Suggestions

Filter Close

Current Assignment of PSY 522 Lec 1

Not assigned.
 Room Locations: 1 (PSYC 3187)
 Time Locations: 1 (T 9:30a)
 Minimal Room Size: 30

Conflict Table

Type Student Conflicts
 T 9:30a - 10:20a 2 (c2) ...

Suggestions

Score	Class	Date	Time	Room	Students
<i>(all 2 possibilities up to 3 changes were considered, no suggestion found)</i>					

Conflict-based Statistics

<input type="checkbox"/>	37054x Room PSYC 3187				
<input type="checkbox"/>	37054x T 9:30a - 10:20a Full Term PSYC 3187 HANNEMANN, ROBERT E				
<input type="checkbox"/>	37054x PSY 522 Lec 1	←	TTh 9:00a - 10:15a Full Term PSYC 3187 MOHR, DONALD W		

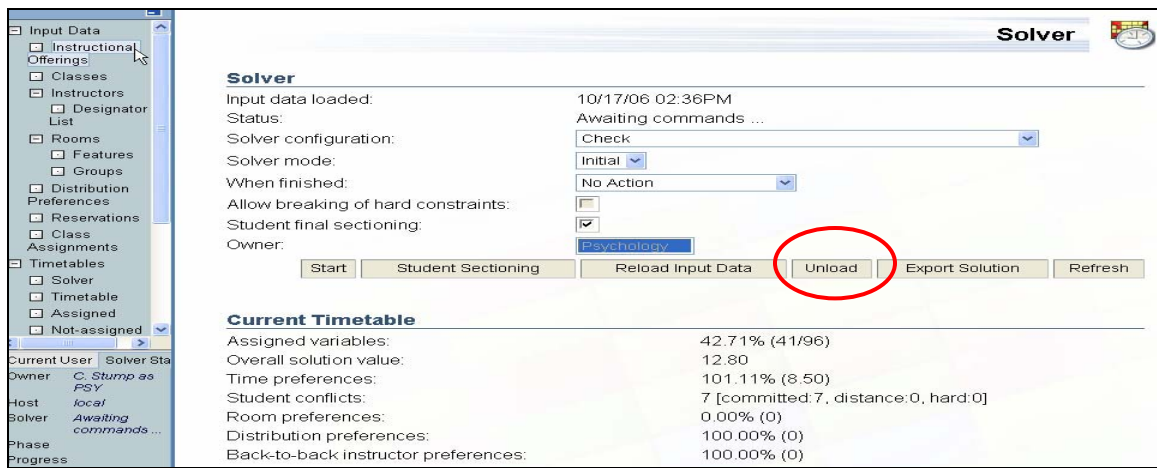
6. If you have fixed all problems with not-assigned classes and the solver found a complete solution (as described in step 3a), you can Unload and proceed to the next part of this manual.

3. Create an optimized timetable for your department

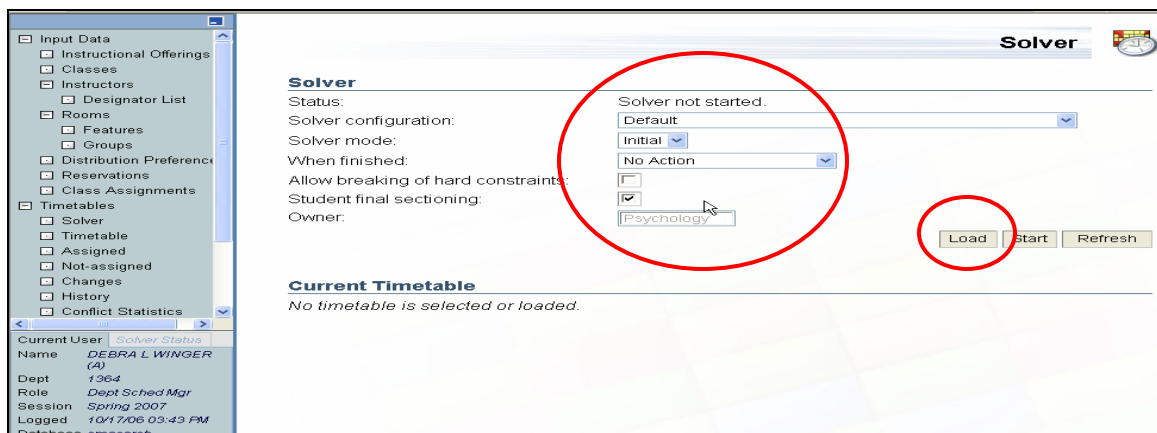
If running the solver in the “Check” configuration has resulted in all classes being assigned, you can proceed with creating an optimized timetable for your department. Please note, however, that the ability of the solver to optimize the solution will depend on the amount of flexibility you have allowed it in your input data. If the vast majority of your times and rooms have been marked as "Required" there is little or no room for optimization.

In this section another configuration (Default) of the solver will be used which attempts to optimize satisfaction of the preferences that you have entered as well as minimize student conflicts.

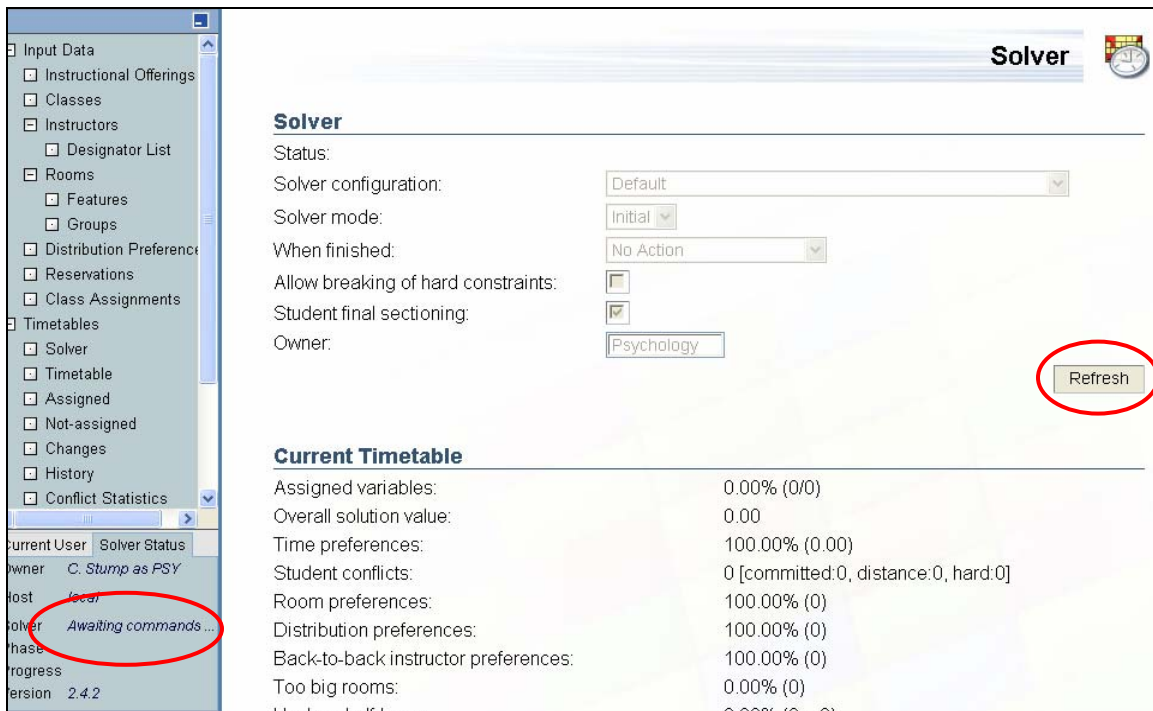
1. Unload the data from the solver (click Unload in the **Solver** screen) if you have not done this already.



2. Set the configuration to Default and load the data.
 - a. Click Load.



- b. Watch the progress in the Solver Status part of the page (see 1.3)
When the status is “Awaiting commands...,” click Refresh.



- c. Scroll down to see if there are any problematic warnings.

3. If there are no warnings indicating classes you expect to timetable have not been loaded, click the Start button in the top section of the Solver screen. You may either wait for the solver to finish (most problems have a 30-minute time limit set on the solver) and then proceed as described in section 4, or continue as described below. You can leave the application and do other things, or even log out entirely, without affecting the solver's progress.
4. Progress of the solver can be monitored in the Solver Status frame in the lower left of the screen. For most departmental problems a first complete solution should be found within five minutes and the solver will move on to improving upon this initial solution. This step may take longer if, for instance, you have set many distribution constraints. If a complete solution has not been found after five minutes, you may wish to stop the solver and fix any problems as described in section 2 of this manual (it is not necessary to unload and start the solver with Check configuration).

- Wait while the solver is fixing the solution. (During the fixing stage, the solver goes through all classes and checks if there are any free times or rooms that would be better for that class – if there are any, it changes the assignment. It only searches for changes that don't interfere with other classes.) Note: this stage may be skipped in some cases, so don't worry if you don't see this status.

Solver

Input data loaded: 10/18/06 10:27 AM
 Status: Solving problem ...
 Progress: Searching for initial solution ... (0.0%)
 Solver configuration: Default
 Solver mode: Initial
 When finished: No Action
 Allow breaking of hard constraints:
 Student final sectioning:
 Owner: Psychology

Stop Refresh

Best Timetable Found So Far

Assigned variables:	45.36% (44/97)
Overall solution value:	13.40
Time preferences:	38.21% (8.50)
Student conflicts:	7 [committed:7, distance:0, hard:0]
Room preferences:	0.00% (0)
Distribution preferences:	100.00% (0)

Current User: Solver Status
 Owner: C. Stump as PSY
 Host: local
 Solver: Solving problem ...
 Phase: Searching for initial solution ...
 Progress: 89 of 97 (91.8%)
 Version: 2.4.3

- You can stop the solver at any time when it is trying to improve the current solution. (Improving the solution is more complex than just finding a different time or room which are currently available; that is, more complex than fixing.) The longer you run the solver, the more preferences will be met. The time out is 30 minutes. To stop the solver, click Stop.

Solver

Input data loaded: 10/18/06 10:27 AM
 Status: Solving problem ...
 Progress: Searching for initial solution ... (0.0%)
 Solver configuration: Default
 Solver mode: Initial
 When finished: No Action
 Allow breaking of hard constraints:
 Student final sectioning:
 Owner: Psychology

Stop Refresh

Best Timetable Found So Far

Assigned variables:	45.36% (44/97)
Overall solution value:	13.40
Time preferences:	38.21% (8.50)
Student conflicts:	7 [committed:7, distance:0, hard:0]
Room preferences:	0.00% (0)
Distribution preferences:	100.00% (0)

Current User: Solver Status
 Owner: C. Stump as PSY
 Host: local
 Solver: Solving problem ...
 Phase: Searching for initial solution ...
 Progress: 89 of 97 (91.8%)
 Version: 2.4.3

7. After you have stopped the solver, click on Student Sectioning. That will try to move students around and reduce the number of student conflicts. When the solver is creating a timetable, it looks at the enrollment data from the last like-semester – using this data, it assigns last like-semester students to classes. (Student conflicts are computed based on last-like semester student demand.)
8. Click Refresh again.

The screenshot shows the Solver application interface. On the left is a navigation tree with categories like Input Data, Rooms, Timetables, and Solver. The main window is titled 'Solver' and displays the following information:

- Solver**
 - Input data loaded: 10/18/06 10:27AM
 - Status: Solver stopped.
 - Solver configuration: Default
 - Solver mode: [Dropdown]
 - When finished: [Dropdown]
 - Allow breaking of hard constraints:
 - Student final sectioning:
 - Owner: Psychology
- Buttons: Start, Student Sectioning, Reload Input Data, Unload, Export Solution, Refresh
- Best Timetable Found So Far**
 - Assigned variables: 100.00% (97/97)
 - Overall solution value: 136.40
 - Time preferences: 30.80% (27.50)
 - Student conflicts: 152 [committed: 145, distance: 0, hard: 0]
 - Room preferences: 92.86% (-52)
 - Distribution preferences: 100.00% (0)
 - Back-to-back instructor preferences: 98.21% (2)

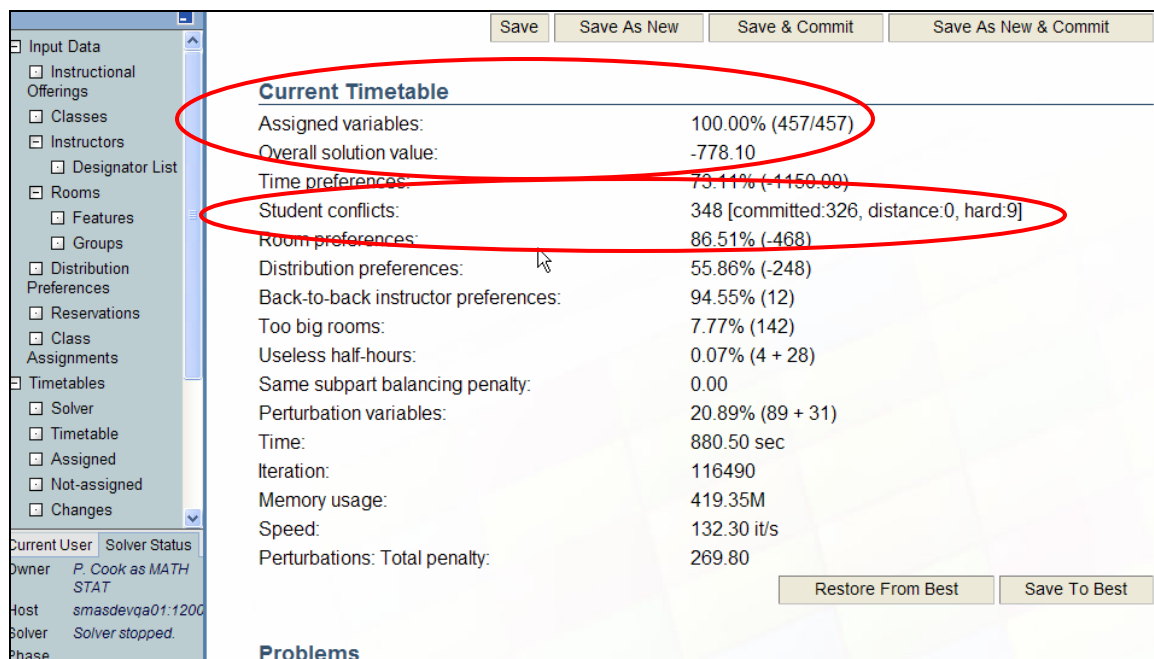
The 'Student Sectioning' and 'Refresh' buttons are circled in red in the original image.

4. Look at the properties of the timetable

Before you look at the timetable, it is recommended you look at the properties of the timetable. You can see some of them in the **Solver** screen and then look at a different kind of information in the Reports screen.

4.1 Properties described in the Solver screen

The first place to find information about the timetable is the Solver screen. The properties of the timetable you will review is in the **Current Timetable** section. (Scroll down from “Best Timetable Found So Far” to see this section.) The most important numbers are Assigned variables and Student conflicts.



The screenshot shows the Solver interface with the 'Current Timetable' section expanded. The following table represents the data shown in the screenshot:

Current Timetable	
Assigned variables:	100.00% (457/457)
Overall solution value:	-778.10
Time preferences:	73.11% (-1150.00)
Student conflicts:	348 [committed:326, distance:0, hard:9]
Room preferences:	86.51% (-468)
Distribution preferences:	55.86% (-248)
Back-to-back instructor preferences:	94.55% (12)
Too big rooms:	7.77% (142)
Useless half-hours:	0.07% (4 + 28)
Same subpart balancing penalty:	0.00
Perturbation variables:	20.89% (89 + 31)
Time:	880.50 sec
Iteration:	116490
Memory usage:	419.35M
Speed:	132.30 it/s
Perturbations: Total penalty:	269.80

Buttons at the top: Save, Save As New, Save & Commit, Save As New & Commit. Buttons at the bottom: Restore From Best, Save To Best.

Assigned variables: The percentage indicates for how many classes the solver could find a time and room – for a timetable to be workable, this number should be 100%. The numbers in the parenthesis (e.g., 457/457) indicate for how many classes out of the total number of your loaded classes the solver found a time and room.

Student conflicts: If the students from the last like-semester register for the same classes as they did last time, there will be this number of situations when a student wants to take two classes which are not possible to take together (e.g., most likely because they overlap in time). This should be an indication about the number of conflicts there could be between classes for this semester, especially if the curriculum is fairly strict about what the students should take during which semester. You will see more information about these conflicts in the Reports screen.

4.2 Reports

The **Solution Reports** screen has several sections. If you don't see some of them, it means that there haven't been problems of that kind, and therefore the section is not displayed.

Room Allocation

Describes the usage of your rooms based on size (there are a few categories based on size).

Solution Reports

Room Allocation

Group	Size	NrRooms*	CIUse	CIShould	CIMust*	HrUse	HrShould	HrMust*
40 ... 60	40 ... 51	20 (20)	345	221	221 (221)	43.65	27.50	27.50 (27.50)
20 ... 40	24 ... 39	5 (25)	83	207	36 (428)	36.40	101.00	12.80 (42.20)

Group group size <minimum, maximum>
Size actual group size (size of the smallest and the biggest room in the group)
NrRooms number of rooms in the group
CIUse number of classes that are using a room from the group (actual solution)
CIShould number of classes that "should" use a room of the group (smallest available room of a class is in this group)
CIMust number of classes that must use a room of the group (all available rooms of a class are in this group)
HrUse average hours a room of the group is used (actual solution)
HrShould average hours a room of the group should be used (smallest available room of a class is in this group)
HrMust average hours a room of this group must be used (all available rooms of a class are in this group)
 *) cumulative numbers (group minimum ... inf) are displayed in parentheses.

Violated Distribution Preferences

Type	Preference	Class	Time	Room
------	------------	-------	------	------

Violated Distribution Preferences

This is a list of distribution preferences that have been violated. For example, if your strongly preferred distribution preference for Back-To-Back between class A and class B has been violated, you can be sure that these classes are not back to back in the current timetable.

HrMust average hours a room of this group must be used (all available rooms of a class are in this group)
 *) cumulative numbers (group minimum ... inf) are displayed in parentheses.

Violated Distribution Preferences

Type	Preference	Class	Time	Room
1 Hour Between	Strongly Preferred	MA 304 Lec 1 MA 598D Lec 1	TTh 10:30a - 11:45a TTh 1:30p - 2:45p	REC 313 MATH 215
At Least 1 Hour Between	Strongly Preferred	MA 262 Lec 5 MA 696A Lec 1	TTh 1:30p - 2:45p TTh 3:00p - 4:15p	UNIV 001 REC 227
At Least 1 Hour Between	Strongly Preferred	MA 266 Lec 10 MA 514 Lec 1	TTh 1:30p - 2:45p TTh 12:00p - 1:15p	REC 227 REC 114
Back-To-Back	Strongly Preferred	MA 161 Lec 1 MA 385 Lec 1	MWF 11:30a - 12:20p MWF 1:30p - 2:20p	EE 129 REC 114
Back-To-Back	Strongly Preferred	MA 162 Lec 1 MA 182 Lec 2	MWF 12:30p - 1:20p MTWF 10:30a - 11:20a	EE 129 LWSN B134
Back-To-Back	Strongly Preferred	MA 261 Lec 3 MA 643 Lec 1	MWF 2:30p - 3:20p MWF 12:30p - 1:20p	EE 129 REC 302
Back-To-Back	Strongly Preferred	MA 174 Lec 4 MA 174 Lec 5	MWF 1:30p - 2:20p MWF 11:30a - 12:20p	LWSN B134 LWSN B134
Back-To-Back	Strongly Preferred	MA 262 Lec 2 MA 262 Lec 3	MWF 3:30p - 4:20p MWF 12:30p - 1:20p	REC 114 REC 112

Instructor Back-To-Back Preferences

Information about instructors whose back-to-back classes are far away from each other – so far away that such assignment of rooms is discouraged or strongly discouraged by the solver.

Input Data	Different Time	Strongly Preferred	MA 690A Lec 1	TTh 12:00p - 1:15p	UNIV 217
			MA 690B Lec 1	MWF 10:30a - 11:20a	REC 112
			MA 690C Lec 1	MWF 9:30a - 10:20a	MATH 215
			MA 690D Lec 1	TTh 12:00p - 1:15p	MATH 215
			MA 690G Lec 1	MWF 9:30a - 10:20a	LWSN B134
	Same Room	Strongly Preferred	MA 265 Lec 3	MWF 10:30a - 11:20a	REC 114
			MA 265 Lec 4	MWF 8:30a - 9:20a	REC 113

Instructor Back-to-Back Preferences					
Instructor	Preference	Distance	Class	Time	Room
Arapura, Donu	Strongly Discouraged	60m	MA 690A Lec 1 MA 385 Lec 2	TTh 12:00p - 1:15p TTh 1:30p - 2:45p	UNIV 217 REC 114
Frigyik, Bela	Strongly Discouraged	60m	MA 265 Lec 10 MA 265 Lec 11	TTh 12:00p - 1:15p TTh 1:30p - 2:45p	UNIV 001 REC 307
Goins, Edray	Strongly Discouraged	60m	MA 366 Lec 1 MA 366 Lec 2	TTh 9:00a - 10:15a TTh 10:30a - 11:45a	UNIV 003 REC 112
Gu, Chong	Strongly Discouraged	60m	STAT 511 Lec 2 STAT 503 Lec 4	MWF 8:30a - 9:20a MWF 9:30a - 10:20a	UNIV 217 REC 121
Lee, Yi-Jen	Strongly Discouraged	60m	MA 351 Lec 3 MA 351 Lec 4	TTh 1:30p - 2:45p TTh 3:00p - 4:15p	REC 225 UNIV 217
Wlodarczyk, Jaroslaw	Strongly Discouraged	60m	MA 262 Lec 5 MA 696A Lec 1	TTh 1:30p - 2:45p TTh 3:00p - 4:15p	UNIV 001 REC 227
Xiu, Dongbin	Strongly Discouraged	60m	MA 266 Lec 7 MA 266 Lec 6	TTh 9:00a - 10:15a TTh 10:30a - 11:45a	UNIV 217 REC 225

Student Conflicts

This is a complete list of student conflicts (their total is the number you could see in the **Solver** screen). The number in the first column tells you how many students wanted to take both of the classes in the second column during that semester. If the number of conflicts for two classes is too high, you may want to either change the preferences for one of the classes (if both of them have a single time and room that they require) or change the assigned time in the timetable. Such changes are described later in this manual.

Input Data	Strongly Discouraged	60m	MA 366 Lec 2	TTh 10:30a - 11:45a	REC 112
			MA 690A Lec 1 <td>TTh 12:00p - 1:15p <td>UNIV 217 </td></td>	TTh 12:00p - 1:15p <td>UNIV 217 </td>	UNIV 217
			MA 385 Lec 2 <td>TTh 1:30p - 2:45p <td>REC 114 </td></td>	TTh 1:30p - 2:45p <td>REC 114 </td>	REC 114
			STAT 511 Lec 2 <td>MWF 8:30a - 9:20a <td>UNIV 217 </td></td>	MWF 8:30a - 9:20a <td>UNIV 217 </td>	UNIV 217
			STAT 503 Lec 4 <td>MWF 9:30a - 10:20a <td>REC 121 </td></td>	MWF 9:30a - 10:20a <td>REC 121 </td>	REC 121

Student Conflicts						
NrConflicts	Class	Time	Room	Hard	Distance	Fixed
7	STAT 417 Lec 1 MA 490A Lec 1	TTh 3:00p - 4:15p TTh 1:30p - 3:20p	REC 313 WTHR 320			✓
5	MA 351 Lec 4 ENGR 117 Lab 2	TTh 3:00p - 4:15p Th 1:30p - 3:20p	UNIV 217 ENAD 135			✓
4	STAT 597 Lec 1 IE 530 Lec 1	F 2:30p - 3:20p MWF 2:30p - 3:20p	UNIV 119 MSEE B012			✓
4	STAT 520 Lec 1 STAT 528 Lec 1	TTh 1:30p - 2:45p TTh 1:30p - 2:45p	UNIV 119 REC 123	✓		
4	MA 538 Lec 1 STAT 526 Lec 1	TTh 12:00p - 1:15p TTh 12:00p - 1:15p	REC 315 REC 313	✓		
4	MA 353 Lec 1 STAT 417 Lec 1	TTh 3:00p - 4:15p TTh 3:00p - 4:15p	REC 112 REC 313	✓		
4	MA 161E Lec 2 C S 158 Lec 1	MWF 3:30p - 4:20p MW 3:30p - 4:20p	EE 170		✓	✓
3	STAT 417 Lec 1 MA 366 Rec 3	TTh 3:00p - 4:15p T 2:30p - 3:20p	REC 313 SC 246			✓
3	STAT 311 Lec 1 BIOL 242 LabP 1	MWF 11:30a - 12:20p M 11:30a - 12:20p	REC 307 LILY 1105			✓
3	STAT 301T Lec 5 BCM 175 Lec 1	MW 3:30p - 4:20p MW 3:30p - 4:20p	UNIV 119 BRNG 2290			✓
3	STAT 301T Lec 2	MW 1:30p - 2:20p	UNIV 119			✓

If you want to print the **Reports** screen, click the Export PDF button at the bottom of the screen.

Section	Class	Room	Time	Section	Check 1	Check 2
1	MA 159 Rec 5	TTh	12:30p - 1:20p	EE 005		
1	OLS 284 Lec 2	TTh	12:00p - 1:15p	WTHR 172		
1	MA 159 Rec 5	TTh	12:30p - 1:20p	EE 005	✓	✓
1	DANC 301 Stdo 1	TTh	12:25p - 1:15p	PAO 1171		
1	MA 159 Rec 5	TTh	12:30p - 1:20p	EE 005	✓	✓
1	C&IT 255 Lec 1	TTh	12:00p - 1:15p	EE 270		
1	MA 159 Rec 5	TTh	12:30p - 1:20p	EE 005	✓	✓
1	C&IT 136 Lab 4	TTh	11:30a - 1:20p	SC 289		
1	MA 159 Rec 5	TTh	12:30p - 1:20p	EE 005	✓	✓
1	A&D 113 Stdo 8	TTh	11:30a - 2:20p	PAO 3131		
1	MA 159 Rec 4	TTh	11:30a - 12:20p	EE 005	✓	✓
1	PSY 120 Lec 2	TTh	12:00p - 1:15p	LILY 1105		
1	MA 159 Rec 4	TTh	11:30a - 12:20p	EE 005	✓	✓
1	ECON 251 Lec 1	TTh	12:00p - 1:15p	EE 129		
1	MA 159 Rec 2	TTh	9:30a - 10:20a	EE 005	✓	✓
1	ENGL 421 Lec 3	TTh	9:00a - 10:15a	BRNG B291		
1	MA 159 Rec 2	TTh	9:30a - 10:20a	EE 005	✓	✓
1	C S 110 Lab 3	Th	9:30a - 11:20a	PHYS 014		
1	MA 139 Lec 2	MWF	3:30p - 4:20p	REC 122		✓
1	EDCI 270 Lab 4	W	3:30p - 5:20p	BRNG B282		
1	MA 137 Lec 1	MWF	12:30p - 1:20p	REC 227		✓
1	EDCI 270 Lab 6	W	11:30a - 1:20p	BRNG B282		

Note: there is color-coding in place for the times and rooms both in the violated distribution preferences and for the student conflicts. This color coding is the same as for the preferences you set on classes. If you see a room in blue letters, it means that the class requires this room. If you see a time in dark green letters, it means that this time was set as strongly preferred for the class.

Section Balancing

This gives you information about those scheduling subparts in which the classes are not distributed very evenly throughout a day. For example, if your subpart has three classes and all the classes are at the same time, then all the classes of this subpart will be listed here, since the solver's configuration assumes you prefer your classes spread (so that students have options) and the solver wants to warn you that this was not possible for one of your subparts.

5. Look at the timetable

The timetable can then be seen in either the Timetable or the Assigned screen, as described in this chapter.

5.1 Timetable

Click on the Timetable item in the left hand side menu.

The screenshot shows the Solver interface. On the left is a navigation menu with 'Timetable' highlighted. The main area is titled 'Solver' and contains configuration options: 'Input data loaded: 10/31/06 10:33AM', 'Status: Awaiting commands ...', 'Solver configuration: Check', 'Solver mode: Initial', 'When finished: No Action', 'Allow breaking of hard constraints: [checkbox]', 'Student final sectioning: [checkbox]', and 'Owner: Mathematics and Statistics'. Below these are buttons for 'Start', 'Student Sectioning', 'Reload Input Data', 'Unload', 'Export Solution', and 'Refresh'. A section titled 'Best Timetable Found So Far' lists various metrics: 'Assigned variables: 100.00% (447/447)', 'Overall solution value: 0.00', 'Time preferences: 33.29% (-536.00)', 'Student conflicts: 232 [committed204, distance0, hard26]', 'Room preferences: 78.57% (-420)', 'Distribution preferences: 24.32% (-108)', 'Back-to-back instructor preferences: 86.00% (28)', 'Too big rooms: 7.05% (126)', and 'Useless half-hours: 0.16% (8 + 62)'. The current user is identified as Debra L. Winger (A).

The **Timetable** screen that is displayed shows you a time grid (which you also can export to PDF for printing).

The screenshot shows the Timetable interface. It features a 'Filter' section with options for 'Week: All weeks', 'Resource: Room', 'Day: All except Saturday', 'Daytime/Evening: Daytime', 'Display Mode: In Row [horizontal]', 'Background: Time Preferences', 'Show discouraged free times: [checkbox]', and 'Order By: Name [asc]'. Buttons for 'Change', 'Export PDF', and 'Refresh' are visible. Below the filter is a 'Timetable' grid. The grid has columns for days and times: Mon 7:30a, Mon 8:00a, Mon 8:30a, Mon 9:00a, Mon 9:30a, Mon 10:00a, Mon 10:30a, Mon 11:00a, Mon 11:30a, Mon 12:00a, Mon 12:30a, Mon 1:00p, Mon 1:30p, Mon 2:00p. The rows show course sections: EE 005 (48) and EE 222 (40) are assigned to MA 223 Lec 22, MA 223 Lec 13, MA 223 Lec 2, MA 223 Lec 6, MA 223 Lec 19, MA 223 Lec 20, MA 223 Lec 17, MA 223 Lec 5, MA 223 Lec 3, MA 223 Lec 8, MA 223 Lec 4, and MA 223 Lec 10. The 'Export PDF' button is circled in red.

You can choose what information you want to have displayed in the time grid and how by setting the filter in the upper part of the screen. The various options are:

Week

See the whole semester or only a particular week from the semester.

Resource

Should there be a time grid per room or a time grid per instructor?

Filter

Specify the resource (e.g., if you only want to see rooms in the KNOY building, write KNOY in the filter text field).

Day

What days within a week do you want to see? All, All except Saturday, or a particular day (e.g., Monday)?

Daytime/Evening

What parts of the days do you want to see? The most usual is Daytime.

Display Mode

“Per Week” displays a week’s schedule of given room or instructor. “Vertical” has days on top, “Horizontal” has days on the left (and times on top). “In Row [horizontal]” has rooms (or instructors) on the left and all the times on top (starting with all Monday times, ending with all Friday times, if your “Day” option is “All except Saturday”).

Background

The background color of classes displayed in the time grid can reflect some properties of the timetable. E.g., if you select “Time Preferences”, the background color expresses whether the class was assigned a required or strongly preferred (etc.) time. The legend of the colors is below the timetable displayed.

Show discouraged free times

Check this if you want to see useless half-hours in the timetable (not necessary to use).

Order By

Decide the order of rooms/instructors in which their time grids should be displayed.

See next page for the **Timetable** screen with these options displayed.

Timetable

Filter

Week: All weeks
 Resource: Room
 Filter:
 Day: All except Saturday
 Daytime/Evening: Daytime
 Display Mode: In Row [horizontal]
 Background: Time Preferences
 Show discouraged free times:
 Order By: Name [asc]

Change Export PDF Refresh

	Mon 7:30a	Mon 8:00a	Mon 8:30a	Mon 9:00a	Mon 9:30a	Mon 10:00a	Mon 10:30a	Mon 11:00a	Mon 11:30a	Mon 12:00a	Mon 12:30a	Mon 1:00p	Mon 1:30p	Mon 2:00p
EE 005 (48)	MA 223 Lec 22 0.0.0		MA 223 Lec 2 0.0.0		MA 223 Lec 19 0.0.0		MA 223 Lec 17 0.0.0		MA 223 Lec 3 0.0.0		MA 223 Lec 4 0.0.0		MA 223 Lec 0.0.0	
EE 222 (40)	MA 223 Lec 13 0.0.0		MA 223 Lec 6 0.0.0		MA 223 Lec 20 0.0.0		MA 223 Lec 5 0.0.0		MA 223 Lec 8 0.0.0		MA 223 Lec 10 0.0.0		MA 223 Lec 0.0.0	

Whenever you make a change to the filter, make sure you click “Change” under the filter so that the changes can be applied.

In the time grids, you can click on any class from your departmental set of classes and make changes to the times/rooms (if the time/room is not fixed as “required”). See section 6 “Make changes to the timetable.”

5.2 Assigned

Click on Assigned in the left hand side menu. In the **Assigned Classes** screen, a list of your departmental classes appears with assigned times and rooms. There is color-coding in place for times and rooms. For example, if the room is written in blue letters, it means that this room was in the set of required rooms for this class. Or, if the time assignment is in dark green, that time was strongly preferred for that class.

Assigned Classes

Filter

Simplified mode:

Apply Export PDF Refresh

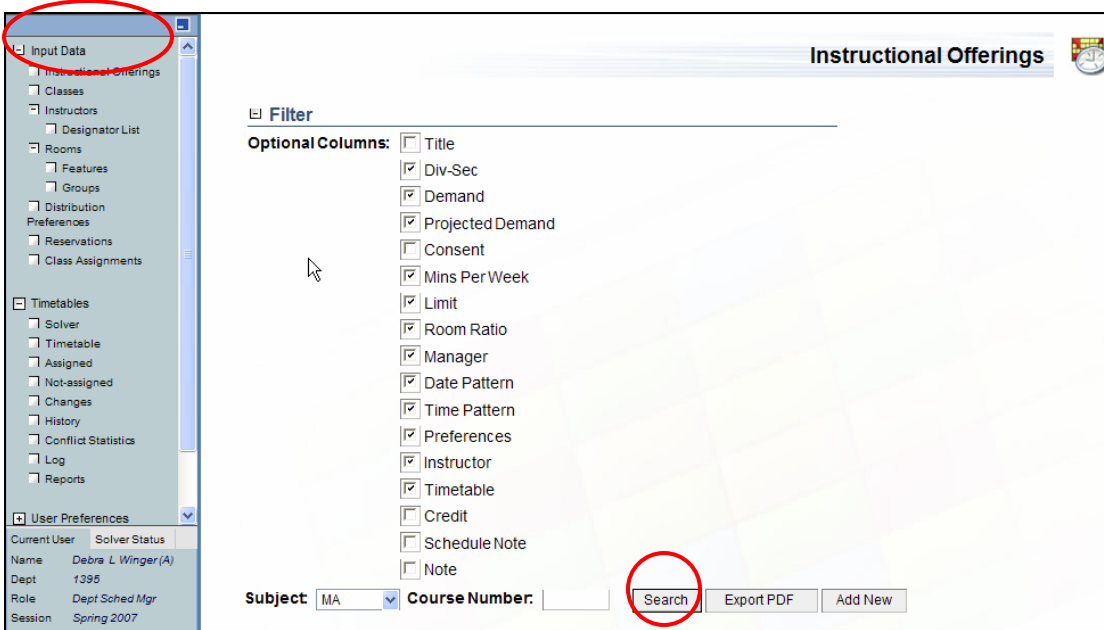
Assigned Classes

Class	Date	Time	Room	Instructor
MA 001 Lec 1	2nd 14wks	MW 2:30p - 3:20p	REC 113	Avramov, Luchezar, Davis, Burgess
MA 001 Lec 2	Full Term	TTh 4:30p - 5:20p	EE 005	Bailey, Charlotte
MA 001 Lab 1	2nd 14wks	Th 11:30a - 1:20p	UNIV 003	Bell, Steven
MA 001 Lab 2	Full Term	Th 3:30p - 5:20p	REC 225	Banuelos, Rodrigo
MA 001 Lab 3	Full Term	Th 7:30a - 9:20a	MATH 211	Zachmanoglou, Eleftherios
MA 001 Lab 4	Full Term	Th 1:30p - 3:20p	LWSN B134	
MA 001 Rec 1	Full Term	TTh 9:30a - 10:20a	MATH 211	MarazziIopez, Leonardo
MA 001 Rec 2	Full Term	TTh 1:30p - 2:20p	MATH 211	Coleman, Kenneth
MA 001 Rec 3	Full Term	TTh 10:30a - 11:20a	REC 121	Becker, James
MA 001 Rec 4	Full Term	TTh 7:30a - 8:20a	REC 112	Buzzard, Gregery
MA 111 Lec 1	Full Term	MWF 4:30p - 5:20p	REC 302	
MA 111 Lec 2	Full Term	MWF 3:30p - 4:20p	REC 302	
MA 137 Lec 1	Full Term	MWF 11:30a - 12:20p	REC 227	

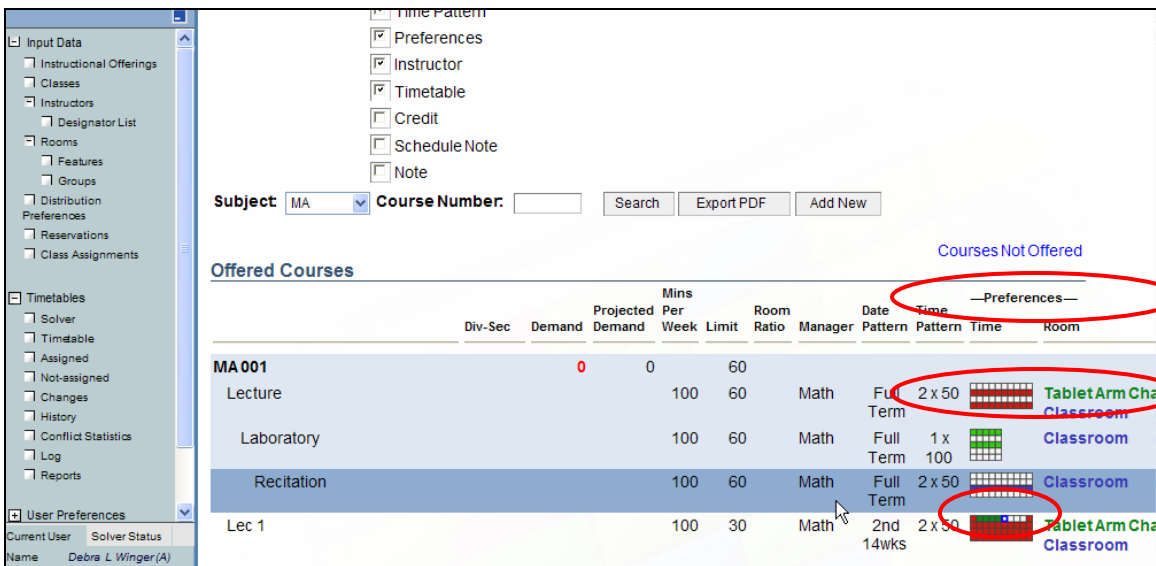
Again, you can click on any class to change its time or room. See section 6 “Make changes to the timetable” for instructions.

5.3 Instructional Offerings

In the filter in the **Instructional Offerings** screen, you have the option to check the Timetable.



Click Search and the assigned time and room will be displayed for each of your classes. Also, if you have Preferences displayed in this screen, a blue-outlined square highlights the assigned time in your time grid.



5.4 Classes

As in Instructional Offerings, you can also display the assigned time and room in the list of Classes. In this list, you have more filtering possibilities – you can e.g. filter by instructor, or sort by assigned time, etc. Whenever you change the filter, click Search to return the desired results.

The screenshot shows the 'Filter' section of the software interface. On the left is a navigation pane with categories like 'Input Data', 'Timetables', and 'Current User'. The main area contains various filter options:

- Optional Columns:** A list of checkboxes for 'Div-Sec', 'Limit', 'Room Ratio', 'Manager', 'Date Pattern', 'Time Pattern', 'Preferences', 'Instructor', 'Timetable', 'Schedule Note', and 'Note'. 'Limit', 'Room Ratio', 'Manager', 'Date Pattern', 'Time Pattern', 'Preferences', 'Instructor', 'Timetable', and 'Schedule Note' are checked.
- Manager:** A dropdown menu set to 'All'.
- Instructional Type:** A dropdown menu set to 'All'.
- Instructor:** A text input field containing 'Liu'.
- Assigned Time:** A series of checkboxes for days of the week (Mon, Tue, Wed, Thu, Fri, Sat, Sun) and a range selector.
- Assigned Room:** A text input field.
- Sort By:** A dropdown menu set to 'Time Pattern' and a checkbox for 'Sort classes only within scheduling subparts'.
- Subject:** A dropdown menu with 'CS', 'MA', and 'STAT' options.
- Course Number:** A text input field.
- Search:** A button circled in red.
- Export PDF:** A button.

6. Make Changes to the Timetable

From any screen which displays your timetabled classes (Timetable, Assigned, Reports,...) clicking on the class number takes you to the **Suggestions** screen.

The screenshot shows the 'Assigned Classes' screen. At the top right, it says 'Assigned Classes'. Below that is a 'Filter' section with 'Simplified mode:' and 'Apply', 'Export PDF', and 'Re' buttons. The main area is a table with the following columns: Class, Date, Time, Room, Instructor, and Students.

Class	Date	Time	Room	Instructor	Students
MA 111 Lec 1	Full Term	MWF 8:30a - 9:20a	REC 302		0
MA 111 Lec 2	Full Term	MWF 7:30a - 8:20a	REC 302		0
MA 137 Lec 1	Full Term	MWF 12:30p - 1:20p	REC 227		+1 (c+1)
MA 137 Lec 2	Full Term	MWF 10:30a - 11:20a	REC 227		0
MA 137 Lec 3	Full Term	MWF 11:30a - 12:20p	REC 227		0
MA 138 Lec 1	Full Term	MWF 4:30p - 5:20p	REC 227		0
MA 138 Lec 2	Full Term	MWF 8:30a - 9:20a	REC 227		0
MA 138 Lec 3	Full Term	MWF 1:30p - 2:20p	REC 227		0
MA 138 Lec 4	Full Term	MWF 3:30p - 4:20p	REC 227		0
MA 138 Lec 5	Full Term	MWF 2:30p - 3:20p	REC 227		0
MA 138 Lec 6	Full Term	MWF 7:30a - 8:20a	REC 227		0
MA 139 Lec 1	Full Term	MWF 4:30p - 5:20p	REC 122		0
MA 139 Lec 2	Full Term	MWF 3:30p - 4:20p	REC 122		+3 (c+3)

The row for 'MA 138 Lec 1' is circled in red. The 'Students' column shows values like '+1 (c+1)' and '+3 (c+3)'. The 'Instructor' column is empty for all rows.

This screen opens in a new window.

The screenshot shows the 'Suggestions' window for 'Current Assignment of MA 001 Lec 1'. The 'Filter' section includes the following options:

- Display conflict table:
- Display suggestions:
- Display placements:
- Display conflict statistics:
- Simplified mode:
- Allow breaking of hard constraints:
- Maximum number of suggestions/placements: 100
- Allow placements: No Restrictions
- Text filter: MWF 9:30
- Room size filter: < [] ... [] >

Buttons for 'Apply' and 'Close' are visible. Below the filter section, the current assignment details are shown: 'Date: 2nd 14wks'.

6.1 Description of the Suggestions screen

The **Suggestions** screen has the following parts:

Filter

The filter allows you to select which sections you want to display in the Suggestions screen and specify the suggestions/placements in which you are interested. The first few items that pertain to Display are self-descriptive.

Simplified Mode

If unchecked, many additional columns appear in the Suggestions and Placements

Maximum number of suggestions/placements

Specify how many suggestions or placements you would like to see in this screen.

The screenshot shows the 'Suggestions' window for 'Current Assignment of MA 111 Lec 1'. The 'Filter' section includes the following options:

- Display conflict table:
- Display suggestions:
- Display placements:
- Display conflict statistics:
- Simplified mode:
- Maximum number of suggestions/placements: 100
- Allow placements: No Restrictions
- Text filter: MWF 9:30
- Room size filter: < [] ... [] >

Buttons for 'Apply' and 'Close' are visible. Below the filter section, the current assignment details are shown: 'Date: Full Term', 'Time: MWF 4:30p - 5:20p', 'Room: REC 302'. A legend at the bottom indicates preference levels: Required (blue), Strongly Preferred (green), Preferred (light green), Neutral (white), Discouraged (yellow), Strongly Discouraged (orange), and Prohibited (red). Red annotations highlight the 'Filter' section and the 'Maximum number of suggestions/placements' field.

The second part of the filter is not hidden when you fold the filter. All these items apply to the Suggestions and to the Placements parts of the screen.

Allow placements

No Restrictions mean that you can change both time and room.

Text filter

Specify the kind of suggestions/placements you would like to see. For example, if you are interested in a particular room, enter a room number, and only suggestions/placements with that room number will be displayed. If you want only Monday times, enter "M", and only items with Monday times will be displayed.

Room size filter

Filter rooms by size. For example, if you enter 10...20, only the suggestions/placements including rooms of this size will be displayed.

The screenshot shows a web interface titled "Suggestions". A red oval highlights the "Filter" section, which contains three input fields: "Allow placements" with a dropdown menu set to "No Restrictions", "Text filter" with a text box containing "MWF 9:30", and "Room size filter" with two text boxes separated by "...". To the right of the filter section are "Apply" and "Close" buttons. Below the filter is a section titled "Current Assignment of MA 111 Lec 1" with the following information: Date: Full Term, Time: MWF 4:30p - 5:20p, Room: REC 302. At the bottom of this section is a legend with seven colored boxes and labels: Required (blue), Strongly Preferred (dark green), Preferred (light green), Neutral (white), Discouraged (yellow), Strongly Discouraged (orange), and Prohibited (red). The word "Suggestions" is also visible at the bottom left of the interface.

Current Assignment

Detailed information about the current assignment of time and room for the class. This section cannot be turned off by the filter. If an item is not applicable for the selected class, it is not displayed (e.g., the Instructor line is not displayed if there is no instructor assigned to teach this class).

Date

The date pattern for the class (full term, odd weeks, ...).

Time

Time currently assigned to this class (can be changed in this screen).

Room

Room currently assigned to this class (can be changed in this screen).

Instructor

The instructor assigned by you to teach this class.

Student Conflicts

Number of student conflicts there are with which class.

Room Locations

Possible room locations for your class. Click the three dots at the end of the list to see all of these possible locations.

Time Locations

Possible time locations for your class, sorted by days and times. Click the three dots at the end of the list to see all of these possible locations.

Minimal Room Size

The minimal required room size is derived from the class limit and the room ratio entered in the Instructional Offerings.

ROOM SIZE INTER. [Apply] [Close]

Current Assignment of MA 001 Lec 1

Date:	2nd 14wks
Time:	MW 12:30p - 1:20p
Room:	REC 112
Instructor:	Avramov, Luchezar, Davis, Burgess
Room Locations:	24 (EE 005, EE 222, EE 236, LILY 2102, ...)
Time Locations:	8 (MW 7:30a, MW 8:30a, MW 9:30a, MW 10:30a, ...)
Minimal Room Size:	30

Legend: Required (blue), Strongly Preferred (green), Preferred (yellow-green), Neutral (white), Discouraged (yellow), Strongly Discouraged (orange), Prohibited (red)

Conflict Table

Conflict Table

This table lists possible times and the student conflicts and violated distribution preferences that will occur if the time is selected for the class – this information should help you decide what time to choose if you want to make a change in time. The underlined time is the current assigned time for the class.

Room:	REC 227	
Student Conflicts:	1× EDCI 270 Lab 6 W 11:30a - 1:20p BRNG B282 [committed]	
Room Locations:	1 (REC 227)	
Time Locations:	10 (MWF 7:30a, MWF 8:30a, MWF 9:30a, MWF 10:30a, ...)	
Minimal Room Size:	40	

<u>Time</u>	<u>Student Conflicts</u>	<u>Violated Distr. Constr.</u>
MWF 7:30a - 8:20a	2 (c2) ...	100 ...
MWF 8:30a - 9:20a	11 (c11) ...	100 ...
MWF 9:30a - 10:20a	5 (c5) ...	0
MWF 10:30a - 11:20a	7 (c7) ...	100 ...
MWF 11:30a - 12:20p	8 (c8) ...	100 ...
<u>MWF 12:30p - 1:20p</u>	1 (c1) ...	0
MWF 1:30p - 2:20p	6 (c6) ...	100 ...
MWF 2:30p - 3:20p	12 (c12) ...	100 ...
MWF 3:30p - 4:20p	7 (c7) ...	100 ...
MWF 4:30p - 5:20p	22 (c21) ...	100 ...

Suggestions

Click the three dots next to the number of Student Conflicts to see the details of those conflicts. Click the three dots next to the number in the column of Violated Distr. Constr. to see which constraint would be violated if the time on that line is selected.

<u>Time</u>	<u>Student Conflicts</u>	<u>Violated Distr. Constr.</u>
MWF 7:30a - 8:20a	2 (c2) ... 1× AGEC 217 Lec 3 MWF 7:30a - 8:20a LILY 1105 [committed] 1× POL 101 Lec 5 MW 7:30a - 8:20a MTHW 210 [committed]	100 ...
MWF 8:30a - 9:20a	11 (c11) ...	100 ...
MWF 9:30a - 10:20a	5 (c5) ...	0
MWF 10:30a - 11:20a	7 (c7) ...	100 ...
MWF 11:30a - 12:20p	8 (c8) ...	100 ...
<u>MWF 12:30p - 1:20p</u>	1 (c1) ...	0
MWF 1:30p - 2:20p	6 (c6) ...	100 ...
MWF 2:30p - 3:20p	12 (c12) ...	100 ...
MWF 3:30p - 4:20p	7 (c7) ...	100 ...
MWF 4:30p - 5:20p	22 (c21) ...	100 ...

Required
Back-To-Back & Same Room

Suggestions

A list of possible changes to the time/room assignment for the class. The Score indicates how good/bad the change is for the timetable. The table is by default sorted by Score.

Note: you can work with the Filter in the upper part of this screen to look for suggestions that include only a specific time or a specific room.

Placements

This table tells you what happens if you decide to keep the current room but change the time assignment for the class.

Suggestions																
Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	Big	Dept	Subp	Pert	
(all 87 possibilities up to 2 changes were considered, no suggestion found)																Search Deeper
Placements																
Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	B				
0	MA 137 Lec 1	Full Term	MWF 12:30p → MWF 9:30a	REC 227	+1	+3 (c+3)	0	0	0	0	0					
	MA 341 Lec 1	Full Term	MWF 9:30a → <i>not-assigned</i>	REC 227 → <i>not-assigned</i>												
(top 1 of 9 placements displayed)																

6.2 Making changes to the timetable

You have four options in this **Suggestions** screen to change the time assignment.

1. Click on the time you want to assign in the list of time locations in the “Current Assignment” section of the screen.

Suggestions

Filter

Allow placements: No Restrictions

Text filter: MWF 9:30

Room size filter: < ... >

Apply Close

Current Assignment of MA 137 Lec 1

Date: Full Term

Time: MWF 11:30a - 12:20p

Room: REC 227

Initial Assignment: MWF 11:30a - 12:20p REC 227

Room Locations: 1 (EE 005, EE 222, EE 236, LILY 2102, ...)

Time Locations: 10 (MWF 7:30a, MWF 8:30a, MWF 9:30a, MWF 10:30a, ...)

Minimal Room Size: 40

Required
 Strongly Preferred
 Preferred
 Neutral
 Discouraged
 Strongly Discouraged
 Prohibited

Conflict Table

2. Click on the time in the Conflict Table.

Conflict Table		
<u>Time</u>	<u>Student Conflicts</u>	<u>Violated Distr. Constr.</u>
MWF 7:30a - 8:20a	2 (c2) ...	100 ...
MWF 8:30a - 9:20a	12 (c12) ...	100 ...
MWF 9:30a - 10:20a	5 (c5) ...	100 ...
MWF 10:30a - 11:20a	5 (c5) ...	100 ...
MWF 11:30a - 12:20p	0	0
MWF 12:30p - 1:20p	25 (c25) ...	100 ...
MWF 1:30p - 2:20p	9 (c8) ...	100 ...
MWF 2:30p - 3:20p	8 (c8) ...	0
MWF 3:30p - 4:20p	6 (c5) ...	100 ...
MWF 4:30p - 5:20p	19 (c19) ...	100 ...

Suggestions															
Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	Big	Dept	Subp	Pert

- Click on a Suggestion that includes this time assignment. (If there are any listed.)
- Click on a Placement that includes this time assignment.

MWF 4:30p - 5:20p	19 (c19) ...	100 ...
-------------------	--------------	---------

Suggestions															
Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	Big	Dept	Subp	Pert
(all 21 possibilities up to 2 changes were considered, no suggestion found)															
<input type="button" value="Search Deeper"/>															

Placements															
Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	Big	Dept	Subp	Pert
+16.5	MA 137 Lec 1	Full Term	MWF 11:30a → MWF 9:30a	REC 227	+3	+5	(c+5)	0	0	+4					
	MA 138 Lec 1	Full Term	MWF 9:30a → not assigned	REC 227 → not assigned											
	MA 137 Lec 2	Full Term	MWF 12:30p → not assigned	REC 227 → not assigned											

(top 1 of 9 placements displayed)

You have three options to change the room assignment.

1. Click on the room you want to assign in the list of room locations in the “Current Assignment” section of the screen.

Suggestions

Filter

Allow placements: No Restrictions ▼

Text filter: MWF 9:30

Room size filter: < ... >

Apply Close

Current Assignment of MA 137 Lec 1

Date: Full Term

Time: MWF 11:30a - 12:20p

Room: REC 227

Initial Assignment: MWF 11:30a - 12:20p REC 227

Room Locations: 1 (EE 005, EE 222, EE 236, LILY 2102, ...)

Time Locations: 10 (MWF 7:30a, MWF 8:30a, MWF 9:30a, MWF 10:30a, ...)

Minimal Room Size: 40

Required
 Strongly Preferred
 Preferred
 Neutral
 Discouraged
 Strongly Discouraged
 Prohibited

Conflict Table

2. Click on a Suggestion that includes this room assignment. (If any are listed)
3. Click on a Placement that includes this room assignment.

MWF 4:30p - 5:20p 19 (c19) ... 100 ...

Suggestions

Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins	Usl	Big	Dept	Subp	Pert
(all 21 possibilities up to 2 changes were considered, no suggestion found)															

Search Deeper

Placements

Score	Class	Date	Time	Room	Conf	Std	Tm	Rm	Dist	Ins
+16.5	MA 137 Lec 1	Full Term	MWF 11:30a → MWF 9:30a	REC 227	+3	+5	(c+5)	0	0	+4
	MA 138 Lec 1	Full Term	MWF 9:30a → <i>not-assigned</i>	REC 227 → <i>not-assigned</i>						
	MA 137 Lec 2	Full Term	MWF 12:30p → <i>not-assigned</i>	REC 227 → <i>not-assigned</i>						

(top 1 of 9 placements displayed)

You will then see the information about your choice in a new section of the **Suggestions** screen, called Selected Assignments. This section shows the selected assignment first and then describes its properties (such as student conflicts etc.). If you wish to proceed and really make this change to the timetable, click Assign. If you don't want to make this change, just closing the Suggestions window will be appropriate.

Although a number of options exist for making changes to time and room assignments, it is highly recommended that new users limit the changes they make to the possibilities displayed in the Suggestions section. These suggestions include a complete sequence of time and room changes necessary to insure that all classes remain assigned. If classes are left unassigned as the result of a change, a section called Conflicting Assignments is displayed right under Selected Assignments and informs you about the classes that needed to be unassigned so that your choice of time and room could be made possible. You can either leave the resolution of these problems for later (the classes will get to the Non-assigned list after you click Assign for this change, so you can access them through that list later), or you can resolve the problem by either:

1. Choosing a suggestion that solves it (the suggestions now include this conflicting class).
2. Clicking on the class that is not assigned and choosing some time and room for it the same way as for the first class.

Selected Assignments										
Class	Date	Time	Room	Std	Tm	Rm	Dist	Ins	Usl	Big Dept Subp
MA 137 Lec 1	FullTerm	MWF 11:30a → MWF 9:30a	REC 227	0 → 5 (c0 → 5)		-100 → -100	-100 → 0			
Conflicting Assignments										
Class	Date	Time	Room	Std	Tm	Rm	Dist	Ins	Usl	Big Dept Subp Pert
MA 137 Lec 2	FullTerm	MWF 12:30p → <i>not-assigned</i>	REC 227 → <i>not-assigned</i>			+100	+100			
MA 138 Lec 1	FullTerm	MWF 9:30a → <i>not-assigned</i>	REC 227 → <i>not-assigned</i>			+100	+4			
Not-assigned classes:		+3	(21 → 24)							
Student conflicts:		+5	(161 → 166)							
Committed student conflicts:		+5	(157 → 162)							
Distance student conflicts:		0	(0)							
Hard student conflicts:		0	(2)							
Time preferences:		0	(-538)							
Room preferences:		0	(-428)							
Distribution preferences:		+4	(-268 → -264)							
Back-to-back instructor preferences:		0	(0)							
Too big rooms:		0	(112)							
Useless half-hours:		0	(40)							
Department balancing penalty:		0	(0)							
Same subpart balancing penalty:		0	(0)							
Perturbation penalty:		+3.5	(0 → 3.5)							
Overall solution value:		+16.5	(-820.5 → -804)							
		2x	MA 137 Lec 1 MWF 9:30a - 10:20a REC 227	[committed]						
			EDCI 270 Lab 5 W 9:30a - 11:20a SC 277							
		2x	MA 137 Lec 1 MWF 9:30a - 10:20a REC 227	[committed]						
			HIST 152 Lec 5 MWF 9:30a - 10:20a PHYS 223							
		1x	MA 137 Lec 1 MWF 9:30a - 10:20a REC 227	[committed]						
			MA 153 Lec 1 MWF 9:30a - 10:20a MATH 175							
<input type="button" value="Assign"/>										

The Selected Assignments will display the whole history of these changes. None of the changes is really made to the timetable until you click Assign.

1x MA 137 Lec 1 MWF 9:30a - 10:20a REC 227 [committed]
 MA 153 Lec 1 MWF 9:30a - 10:20a MATH 175

Assign

Conflict Table

Time	Student Conflicts	Violated Distr. Constr.
MWF 7:30a - 8:20a	2 (c2)	100
MWF 8:30a - 9:20a	12 (c12)	100
MWF 9:30a - 10:20a	5 (c5)	100
MWF 10:30a - 11:20a	5 (c5)	100
MWF 11:30a - 12:20p	0	0
MWF 12:30p - 1:20p	25 (c25)	100
MWF 1:30p - 2:20p	9 (c8)	100
MWF 2:30p - 3:20p	8 (c8)	0
MWF 3:30p - 4:20p	6 (c5)	100
MWF 4:30p - 5:20p	19 (c19)	100

Suggestions

Score	Class	Date	Time	Room	Conf.	Std	Tm	Rm	Dist	Ins	Usr	Blg	Dept	Subp	Perf
+43.5	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227	+1 +25 (c+25)	0	0	+4	0	0	0	0	0	0	+10.5
	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 1:30p	REC 227											
+43.5	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 1:30p	REC 227	+1 +25 (c+25)	0	0	+4	0	0	0	0	0	0	+10.5
	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227											
+54.5	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227	+1 +36 (c+36)	0	0	+4	0	0	0	0	0	0	+10.5
	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 12:30p	REC 227											
+54.5	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 12:30p	REC 227	+1 +36 (c+36)	0	0	+4	0	0	0	0	0	0	+10.5
	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227											
+57.625	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227	+1 +39 (c+39)	+0.5	0	+4	0	0	0	0	0	0	+10.5
	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 4:30p	REC 227											
+57.625	MA 138 Lec 1	Full Term	MWF 9:30a → MWF 4:30p	REC 227	+1 +39 (c+39)	+0.5	0	+4	0	0	0	0	0	0	+10.5
	MA 137 Lec 2	Full Term	MWF 12:30p → MWF 11:30a	REC 227											

(all 70 possibilities up to 2 changes were considered, 6 suggestions displayed)

Search Deeper

Placements

Score	Class	Date	Time	Room	Conf.	Std	Tm	Rm	Dist	Ins	Usr	Blg	Dept	Subp	Perf
+16.5	MA 137 Lec 1	Full Term	MWF 11:30a → MWF 9:30a	REC 227	+3 +5 (c+5)	0	0	+4	0	0	0	0	0	0	+3.5
	MA 138 Lec 1	Full Term	MWF 9:30a → not-assigned	REC 227											
	MA 137 Lec 2	Full Term	MWF 12:30p → not-assigned	REC 227											

When you click Assign, the Suggestions window will automatically be closed. You need to click Refresh in the page from which you got to the Suggestions window to be able to see the changes that you have made. Otherwise you will only see the situation before the change (the page from which you came is not refreshed automatically).

Assigned Classes

Filter
 Simplified mode: **Apply** **Export PDF** **Refresh**

Class	Date	Time	Room	Instructor
MA 111 Lec 1	Full Term	MWF 4:30p - 5:20p	REC 302	
MA 111 Lec 2	Full Term	MWF 3:30p - 4:20p	REC 302	
MA 137 Lec 1	Full Term	MWF 11:30a - 12:20p	REC 227	
MA 137 Lec 2	Full Term	MWF 12:30p - 1:20p	REC 227	
MA 137 Lec 3	Full Term	MWF 1:30p - 2:20p	REC 227	
MA 138 Lec 1	Full Term	MWF 9:30a - 10:20a	REC 227	

7. Save the Timetable

Go back to the Solver screen.

1. Save the current timetable (down the screen) to the Best Timetable Found So Far by clicking on Save to Best.

The screenshot shows the Solver interface with the 'Current Timetable' section selected. The 'Current Timetable' label is circled in red. The 'Save To Best' button is also circled in red. The interface displays various statistics and preferences for the current timetable.

Category	Value
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	98.21% (2)
Too big rooms:	7.47% (29)
Useless half-hours:	0.14% (5 + 69)
Same subpart balancing penalty:	0.00
Time:	2.67 sec
Iteration:	2186
Memory usage:	189.46M
Speed:	817.81 it/s

Current Timetable

Category	Value
Assigned variables:	100.00% (97/97)
Overall solution value:	81.00
Time preferences:	30.80% (27.50)
Student conflicts:	91 [committed:91, distance:0, hard:0]
Room preferences:	92.86% (-52)
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	98.21% (2)
Too big rooms:	7.47% (29)
Useless half-hours:	0.14% (5 + 69)
Same subpart balancing penalty:	0.00
Time:	512.89 sec
Iteration:	350534
Memory usage:	204.61M
Speed:	683.45 it/s

2. Save this best timetable so that you can access it later – in the Best Timetable Found So Far part of the screen, click on Save as New.

The screenshot shows the Solver interface with the 'Best Timetable Found So Far' section selected. The 'Save As New' button is circled in red. The interface displays various statistics and preferences for the best timetable found so far.

Solver mode: Initial
When finished: No Action
Allow breaking of hard constraints:
Student final sectioning:
Owner: Psychology

Start Student Sectioning Reload Input Data Unload Export Solution Refresh

Best Timetable Found So Far

Category	Value
Assigned variables:	100.00% (97/97)
Overall solution value:	81.00
Time preferences:	30.80% (27.50)
Student conflicts:	91 [committed:91, distance:0, hard:0]
Room preferences:	92.86% (-52)
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	98.21% (2)
Too big rooms:	7.47% (29)
Useless half-hours:	0.14% (5 + 69)
Same subpart balancing penalty:	0.00
Time:	512.89 sec
Iteration:	350534
Memory usage:	260.14M
Speed:	683.45 it/s

- When you are done with this timetable, click Unload in the **Solver** screen to unload the timetable from the solver.

The screenshot shows the Solver application interface. On the left is a navigation tree with categories like Input Data, Timetables, and Solver. The main area is titled 'Solver' and shows the following details:

- Input data loaded: 10/18/06 10:27AM
- Status: Awaiting commands ...
- Solver configuration: Default
- Solver mode: [Dropdown]
- When finished: [Dropdown]
- Allow breaking of hard constraints: [Checkbox]
- Student final sectioning: [Checkbox]
- Owner: Psychology

At the bottom of the Solver section, there is a row of buttons: Start, Student Sectioning, Reload Input Data, Unload (circled in red), Export Solution, and Refresh.

Below the buttons is a section titled 'Best Timetable Found So Far' with the following statistics:

Assigned variables:	100.00% (97/97)
Overall solution value:	81.00
Time preferences:	30.80% (27.50)
Student conflicts:	91 [committed:91, distance:0, hard:0]
Room preferences:	92.86% (-52)
Distribution preferences:	100.00% (0)
Back-to-back instructor preferences:	98.21% (2)
Too big rooms:	7.47% (29)
Useless half-hours:	0.14% (5 + 69)
Same subpart balancing penalty:	0.00

At the bottom left, there is a 'Current User' section with the following information:

- Current User: Solver Status
- Owner: C. Stump as PSY
- Host: local
- Solver: Awaiting commands ...
- Phase:
- Progress:
- Version: 2.4.3

8. Work with the interactive solver

The “Interactive” configuration of the solver has the highest flexibility for user’s changes. The user can do almost anything in here, including putting classes to prohibited rooms at prohibited times.

8.1 Create a new timetable

1. Click on Timetables in the left hand side menu. That takes you to the **Timetables** screen. This screen has a list of your Saved Timetables (the list is empty if you haven’t saved any timetable yet).

The screenshot shows the 'Timetables' interface. On the left is a navigation menu with 'Timetables' selected. The main area displays a table of 'Saved Timetables' with columns: Created, Settings, Valid, Committed, Owner, Assign, Total, Time, Stud, Room, and Distr. Below the table, there is a 'Load into interactive solver:' label and a 'Configuration: Interactive' dropdown. A 'Load Empty Solution' button is circled in red.

Created	Settings	Valid	Committed	Owner	Assign	Total	Time	Stud	Room	Distr
09/14/06 03:23PM	Default	✓		MATH STAT	100.00%	-630.70	78.52%	9(d0,h5)	412185044.91%	1.44%
09/15/06 06:35PM	Default	✓		MATH STAT	100.00%	-634.00	80.45%	7(d0,h5)	85.17%	1.36%
09/18/06 03:54PM	Default	✓		MATH STAT	100.00%	-593.70	77.94%	14(d0,h10)	85.17%	1.24%
09/19/06 11:53AM	Default	✓		MATH STAT	100.00%	-599.75	73.09%	12(d0,h6)	90.55%	58.72%
09/19/06 02:22PM	Default	✓		MATH STAT	100.00%	-609.10	73.52%	13(d0,h7)	90.55%	59.63%
09/20/06 11:14AM	Default	✓		MATH STAT	100.00%	-595.25	72.87%	12(d0,h6)	90.55%	58.72%
09/20/06 12:08PM	Default	✓		MATH STAT	100.00%	-595.25	72.87%	12(d0,h6)	90.55%	58.72%
09/25/06 02:08PM	Interactive	✓		MATH STAT	100.00%	737.95	68.03%	10(d0,h6)	-369.05%	57.14%
10/27/06 02:02PM	Default	✓		MATH STAT	99.55%	563.95	75.77%	53(c0,d1,h7)	60.95%	59.82%

2. Under the list of Saved Timetables, click on the Load Empty Solution button at the end of the line which starts with “Load into interactive solver:”. The screen will change – a new section called Loaded Timetable will appear at the top of the Timetables screen.

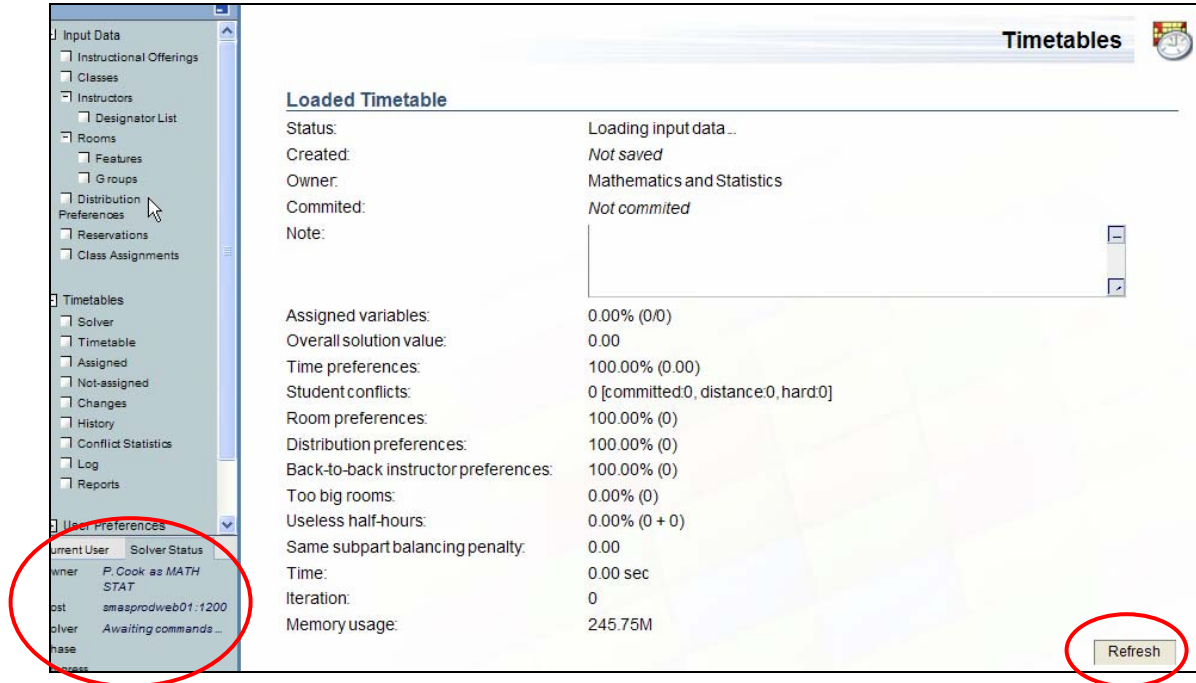
The screenshot shows the 'Timetables' interface after clicking 'Load Empty Solution'. The 'Loaded Timetable' section is circled in red. It displays details for the loaded timetable, including status, creation date, owner, and various preference settings.

Loaded Timetable

Status: Loading input data ...
 Created: Not saved
 Owner: Mathematics and Statistics
 Committed: Not committed
 Note:

Assigned variables: 0.00% (0/0)
 Overall solution value: 0.00
 Time preferences: 100.00% (0.00)
 Student conflicts: 0 [committed:0, distance:0, hard:0]
 Room preferences: 100.00% (0)
 Distribution preferences: 100.00% (0)
 Back-to-back instructor preferences: 100.00% (0)
 Too big rooms: 0.00% (0)
 Useless half-hours: 0.00% (0 + 0)
 Same subpart balancing penalty: 0.00
 Time: 0.00 sec
 Iteration: 0
 Memory usage: 31.61M

- Watch the status in the Solver Status window. When it says “Awaiting commands...”, click the Refresh button on the right hand side by the end of the Loaded Timetable section of the screen.



What is now available to you is a partial timetable. For classes for which you required a specific time and room (classes for which there is only one option), the solver assigned the required time and room. You can see those classes in the Assigned screen (click on Assigned in the left hand side corner). The other classes are listed in the Non-assigned screen (click on the Non-assigned in the left hand side menu to get there). You can click these classes one by one and assign times and rooms manually. See instructions in the “Make changes to the timetable” section of this manual.



When you are done making changes, save the timetable as described in 8.3.

8.2 Work with an existing timetable

First, you will need to load the existing timetable into the solver.

1. Click Timetables in the left hand side menu.
2. Click on the timetable that you would like to load. This timetable becomes the Selected Timetable in the upper part of the screen.

Timetables

Saved Timetables

Created	Settings	Valid	Committed	Owner	Assign	Total	Time	Stud	Room	Distr
09/14/06 03:23PM	Default	✓		MATH STAT	100.00%	-630.70	78.52%	9(d0,h5)	412185044.91%	1.44%
09/15/06 06:35PM	Default	✓		MATH STAT	100.00%	-634.00	80.45%	7(d0,h5)	85.17%	1.36%
09/18/06 03:54PM	Default	✓		MATH STAT	100.00%	-593.70	77.94%	14(d0,h10)	85.17%	1.24%
09/19/06 11:53AM	Default	✓		MATH STAT	100.00%	-599.75	73.09%	12(d0,h6)	90.55%	58.72%
09/19/06 02:22PM	Default	✓		MATH STAT	100.00%	-609.10	73.52%	13(d0,h7)	90.55%	59.63%
09/20/06 11:14AM	Default	✓		MATH STAT	100.00%	-595.25	72.87%	12(d0,h6)	90.55%	58.72%
09/20/06 12:08PM	Default	✓		MATH STAT	100.00%	-595.25	72.87%	12(d0,h6)	90.55%	58.72%
09/25/06 02:08PM	Interactive	✓		MATH STAT	100.00%	737.95	68.03%	10(d0,h6)	-369.05%	57.14%
10/27/06 02:02PM	Default	✓		MATH STAT	99.55%	563.95	75.77%	53(c0,d1,h7)	80.95%	59.82%

Load into interactive solver: Configuration:

3. In the line with “Load into interactive solver:” which is at the end of the Selected Timetable section, click on the Load button at the end of the line.

Selected Timetable - Mathematics and Statistics

Created: 09/14/06 03:23PM
 Owner: Mathematics and Statistics
 Valid:
 Committed: Not committed
 Note:

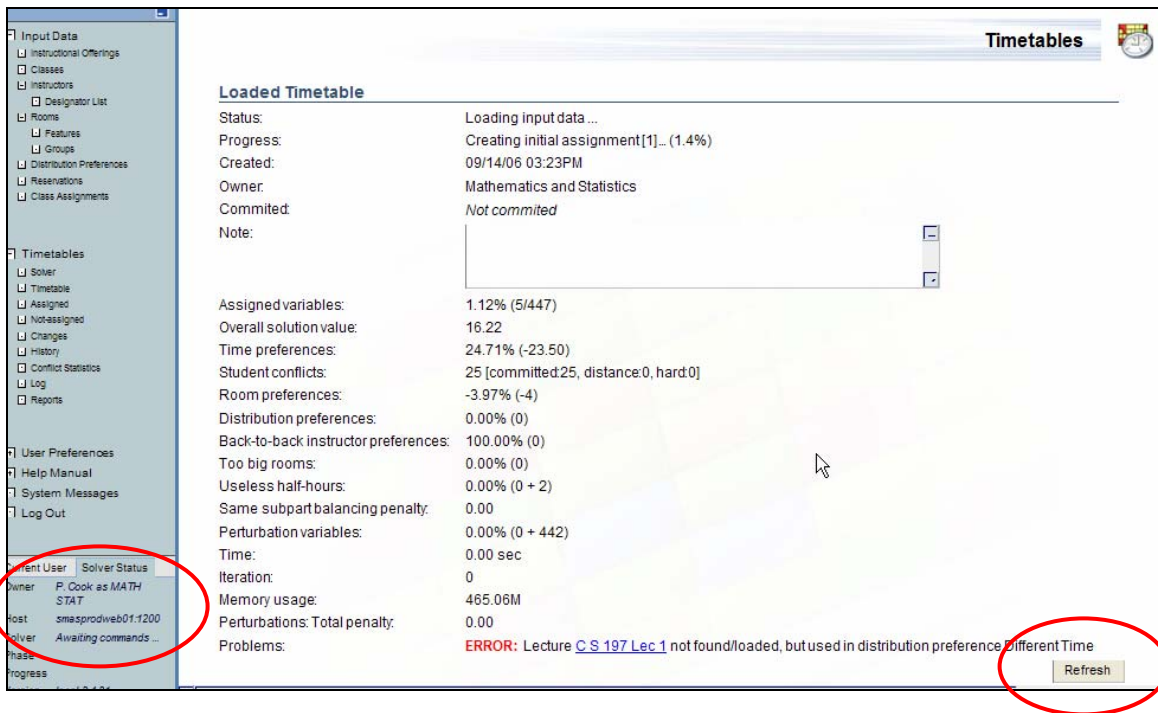
Assigned variables: 100.00% (446/446)
 Overall solution value: -630.70
 Time preferences: 78.52% (-1081.00)
 Student conflicts: 9 (distance:0, hard:5)
 Room preferences: 412185044.91% (-460)
 Distribution preferences: 1.44% (-280.0)
 Back-to-back instructor preferences: 96.00% (8)
 Too big rooms: 7.01% (125)
 Useless half-hours: 0.12% (9 + 38)
 Same subpart balancing penalty: 0.00
 Time: 2148.06 sec
 Iteration: 287620
 Memory usage: 800.60M
 Speed: 133.90 #/s

Problems:

WARNING: Class [STAT 515 Lec 1](#) has no available placement.
 WARNING: Class [STAT 590 Expr 1](#) has no time pattern selected.
 ERROR: Lecture [C S 197 Lec 1](#) not found/loaded, but used in distribution preference Different Time
 WARNING: Same room and overlapping time required:
[MA 161E Rec 2](#) — TTh 1:30p - 2:20p Full Term UNIV 117
[MA 161E Rec 1](#) (id:164668) — TTh 1:30p - 2:20p Full Term UNIV 117
 WARNING: Same room and overlapping time required:
[MA 161E Pso 2](#) — TTh 2:30p - 3:20p Full Term UNIV 117
[MA 161E Rec 1](#) (id:164668) — TTh 2:30p - 3:20p Full Term UNIV 117

Load into interactive solver: Configuration:

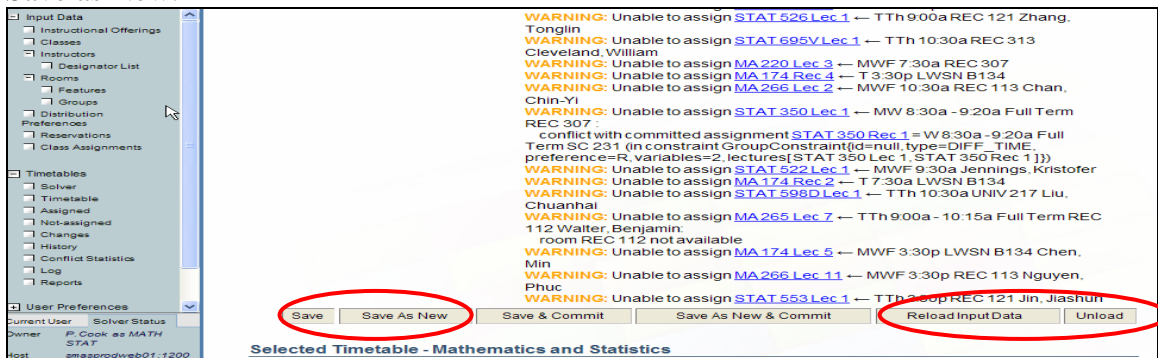
4. Watch the status in the Solver Status window. Click Refresh at the end of the Selected Timetable section when the status is “Awaiting commands...”



When the timetable is loaded, you can make any changes as described in the section “Make changes to the timetable.” You can even override required times/rooms in this interactive mode.

8.3 Save the timetable from interactive solver

When you are done making changes, save the timetable in the **Timetables** screen. You do it just by clicking Save as New in the Loaded Timetable section of the screen. (You can click Save if you just want to replace the timetable that you loaded into the interactive solver.) When the timetable is saved (you again see “Awaiting commands...” in the Solver Status window), click Refresh and then Unload on the same line where you found Save as New.

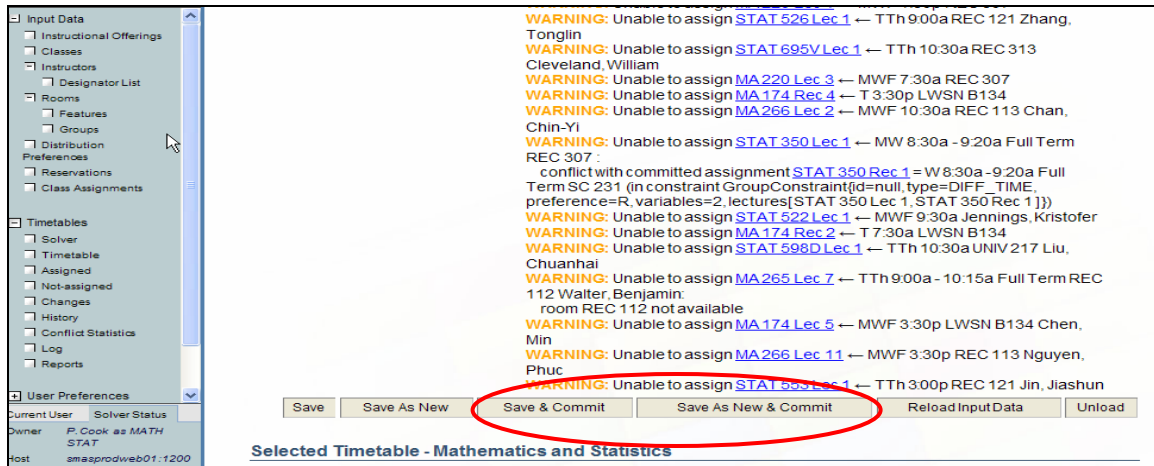


If you want to return to this timetable later, return to 8.2.

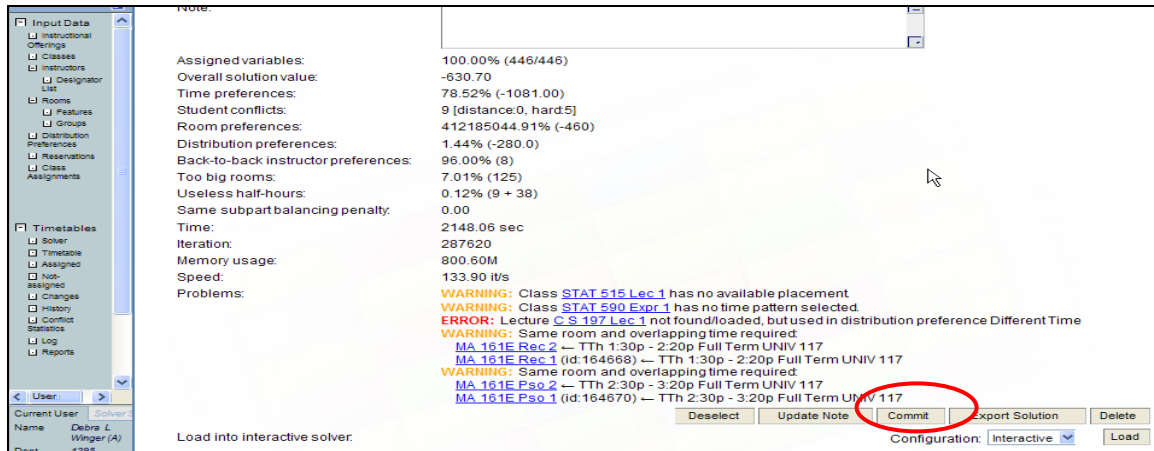
9. Commit a timetable

Committing is submitting your timetable to SMAS. By committing, you are saying that this is the timetable you want. Once you commit, the assigned times and rooms become visible to everybody else (the information can be viewed in the Class Assignments screen – this screen is accessed by clicking on the Class Assignments item in the left hand side menu). Other departments will see student conflicts between your and their classes. Even after you commit, you can make changes to your timetable and commit again until the deadline set by SMAS for departmental timetabling is reached. This should not happen very often.

If the timetable that you want to commit is loaded in the solver (any – default, interactive, ...), proceed as if you wanted to save it, except that instead of clicking “Save” or “Save as New” click “Save & Commit” or “Save as New & Commit”.



If the timetable that you want to commit is saved and you don't want to make any changes to it, go to the **Timetables** screen, click on the timetable you want to commit, and when it appears in the first part of the screen as the Selected Timetable, scroll to the first row of buttons and click Commit.



There is a small chance that the commit won't be successful – a reason would be that you share a room with another department and that department just committed a timetable that uses that room at the same time as your timetable uses it. Or, you share an instructor with another department and that other department wants him to teach at the same time as you do. If the commit didn't succeed, you can see what problems there are if you load the timetable again in the interactive mode. You are also welcome to contact SMAS and go through the problems together with one of their people.

The feedback for you that the timetable has been committed is the date and time in the “Committed” column in the appropriate line in the **Timetables** screen in your list of saved timetables.

The screenshot shows the 'Timetables' application window. On the left is a navigation tree with categories like 'Input Data', 'Timetables', and 'User'. The main area displays details for a selected timetable:

Selected Timetable - Mathematics and Statistics	
Created:	09/14/06 03:23PM
Owner:	Mathematics and Statistics
Valid:	<input type="checkbox"/>
Committed:	11/01/06 02:29PM
Note:	<input type="text"/>
Assigned variables:	100.00% (446/446)
Overall solution value:	-630.70
Time preferences:	78.52% (-1081.00)
Student conflicts:	9 [distance:0, hard5]
Room preferences:	412185044.91% (-460)
Distribution preferences:	1.44% (-280.0)
Back-to-back instructor preferences:	96.00% (8)
Too big rooms:	7.01% (125)
Useless half-hours:	0.12% (9 + 38)
Same subpart balancing penalty:	0.00
Time:	2148.06 sec
Iteration:	287620
Memory usage:	800.60M
Speed:	133.90 it/s
Problems:	<p>WARNING: Class STAT 515 Lec 1 has no available placement</p> <p>WARNING: Class STAT 590 Expr 1 has no time pattern selected.</p> <p>ERROR: Lecture CS 497 Lec 1 not found/loaded, but used in distribution preference Different Time</p>

The 'Committed' field is circled in red in the original image. At the bottom left, the 'User' section shows the current user is Debra L. Winger (A) from Dept 1395, with the role of Dept Sched Mgr.

10. Tips and Tricks

Exporting the solution

If you need to work with the timetable in other applications (e.g., Access, Excel), you can export the solution in the “comma separated values” (CSV) format. There are two options

1. Export the solution from the Solver (or Timetables) screen
 - Click Export Solution (when you have the right timetable loaded or selected)
 - In this case, you will only get the departmental timetable (without LLR or LAB assignments)
2. Export the solution from the Class Assignments screen
 - Set the filter so that Manager is “All”
 - Click Search
 - When the page has loaded, click Export Solution

Appendix A – List of warnings

Type	Message	Note
INFO	No student enrollments for offering O.	There are no last-like semester student enrollments for instructional offering O. Classes of this offering might require a special attention, since they will not create any student conflicts with other classes.
WARN	Class C has no available room(s) (class not loaded).	There are no available rooms for class C. This can, for instance, mean that there are no rooms that are not prohibited by the class preferences and that are of sufficient size.
WARN	Class C has no time pattern selected (class not loaded).	Class C does not have a time pattern selected, but it has a non-zero number of minutes per week.
WARN	Class C has no available time (class not loaded).	There are no available times for class C. This can, for instance, mean that all the times of the selected time pattern(s) are prohibited by the class preferences.
WARN	Class C has no available placement (class not loaded).	Class has available time(s) and room(s) but there is no valid combination (e.g., because of room sharing and/or instructor or room availability). Such a class is only loaded in the interactive mode of the solver.
WARN	Class C has no available placement (after enforcing consistency between the problem and committed solutions, class not loaded).	A reason for inconsistency (conflicting constraints & assignments) is provided as the following INFO message – check the solver log in this case. Such a class is only loaded in the interactive mode of the solver.
WARN	Unable to assign C <- Time Room (placement not valid)	Assignment from the loaded solution is no longer valid (given time/room became prohibited for some reason).
WARN	Unable to assign C <- Time Room : reason	Assignment from the loaded solution is no longer valid (because of some other assignment or a new constraint)
WARN	Class C has zero class limit.	Class has zero class limit. Such a class might require special attention since no students will be sectioned in it and therefore it will not create any student conflicts with other classes.
WARN	Same instructor and overlapping time required: C1 <- time1 room1, C2 <- time2 room2	Classes C1 and C2 are requiring same instructor and a single time each, but these times are overlapping (an instructor cannot teach two classes at the same time).
WARN	Same room and overlapping time required: C1 <- time1 room1, C2 <- time2 room2	Classes C1 and C2 are requiring a single time and a same room, but these times are overlapping (a room cannot accommodate two classes at the same time, unless there is a Can Share Room distribution constraint between these classes)
WARN	Class C requires an invalid placement time room : reason	Class C requires a single time and a single room, but the given time/room is not valid because of some other (committed) assignment.

WARN	Lecture C not found/loaded, but used in distribution preference P	Class C is used by a distribution preference P, but it was not loaded because of some other reason or because it is of different problem (that does not yet contain a committed solution).
WARN	Distribution preference P refers to less than two classes.	Distribution preference P contains only one class – it is required that each distribution constraint is defined between two or more classes.
WARN	Inconsistent course reservations for course C.	Course reservations of course offering C are inconsistently set on classes of the course offering C.
WARN	Cross-listed course C does not have any course reservation.	Cross-listed course offering C does not have any course reservation defined.
WARN	Total number of course reservations is below the offering limit for instructional offering O (total<limit).	Total number of course reservations for the instructional offering O is not equal to the appropriate instructional offering limit. It is below that limit.
WARN	Total number of course reservations exceeds the offering limit for instructional offering O (total>limit).	Total number of course reservations for the instructional offering O is not equal to the appropriate instructional offering limit. It is above that limit.
WARN	No reserved space for students of offering C.	Course reservation of course offering C is zero, but there are some last-like student enrollments for this offering in the database.
WARN	Class limit exceed for class C (nrStudents>classLimit)	Section algorithm enrolled more students into the class C than it is allowed by the class limit. Possible reasons: - inconsistent course reservations set on classes (e.g., reservation is for 50 students, but only one section of 25 is reserved), - total number of course reservations is not equal to offering limit, - configuration limit is smaller than total class limit of a scheduling subpart, - classes of mixed ownership in a subpart (warning can be ignored in this case)
WARN	Student S enrolled to invalid class C.	This can happen in the case of inconsistent course reservations (set on class level) -- there is no class the given student can be enrolled to.
FATAL	Unable to load input data, reason: exception	Do not continue, do not unload the solver, please contact SMAS in this case.