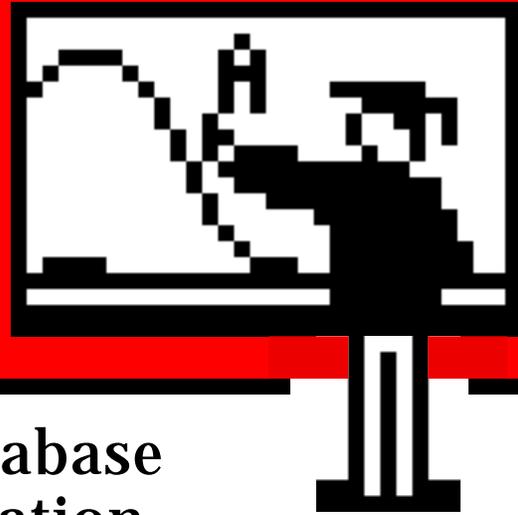


# MacRegistrar™



A Specialized Database  
for Course Information

J. Robert Cooke and E. Ted Sobel

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# MacRegistrar™

## A Specialized Database For Course Information



J. Robert Cooke and E. Ted Sobel  
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# Preface

We created MacRegistrar for teachers who enjoy teaching. Record keeping, especially for larger courses, can be burdensome. J. B. Bugliari, Dean of the University Faculty at Cornell University, realized that computers can provide meaningful relief in this situation and commissioned the creation of this program. University Registrar, Keith Ickes, and Director of Administrative Computing, Russ Vaught, have been actively involved and supportive in bringing MacRegistrar to the Faculty. Computing tools are valued at Cornell University.

This program and a machine-readable class list is being provided on request to each member of the Cornell faculty. Much redundant typing is eliminated, course administrative chores reduced, and an additional tool for analysis of performance made available.

MacRegistrar provides remarkably easy access to records for data entry, data manipulation including grade conversions, full annotation, report generation with text and graphical content, and export of term results to the Registrar in machine-readable form. Additional flexibility and power comes from the extensive export/import capabilities of MacRegistrar which permit you to use word processor, spreadsheet, database, and statistical and graphical tools as extensions to this specialized database.

MacRegistrar can be used with the Macintosh 512E, Macintosh Plus, Macintosh SE, and Macintosh II. Switcher and Multifinder are supported. We have fully exploited the established Macintosh User Interface to produce a remarkably intuitive and easy to use, but powerful, application. Macintosh users with knowledge of only one word processor can read the overview and the guided tour to become a user of MacRegistrar. Power users should read the remaining material, especially the discussion of the export/import capability. This interchange feature allows you to merge data from word processor files or from machine generated records such as attendance and test scores.

We expect MacRegistrar to be useful with courses having enrollments ranging from 2 to 2,600. Both numerical and non-numerical data can be stored. Since the Macintosh interface has been followed, user learning time should be minimal. The data structure provides particularly compact data storage so even large courses can be handled without sacrificing simplicity.

Enjoy!

JRC, ETS

October 1987  
Ithaca

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# **MacRegistrar™: A Specialized Database For Course Information**

## **Chapter 1 Overview of Capabilities**

MacRegistrar is a specialized database designed to simplify record keeping traditionally associated with teaching. It provides many rapid and useful additional techniques to record, analyze, and report the data without sacrificing flexibility. Chapter 1 provides an overview of program capabilities. Chapter 2 provides a guided tour of frequently used techniques; Chapter 3 describes the more specialized capabilities. Chapter 4 is a reference guide for all commands. The appendices provide technical details needed to customize MacRegistrar.

### ***MacRegistrar provides a framework for maintaining student records:***

- create class lists,
- update class lists,
- numerical and letter grade data entry,
- free-form note file,
- annotation of grades for special circumstances,
- review and print class summaries,
- create histograms and descriptive statistics,
- transfer data between MacRegistrar and statistical, graphical, spreadsheet, and database programs for additional analysis,
- convenient automatic calculation and manual adjustment of term grades, and
- manual and machine-readable transfer of term results to the Registrar.

### ***MacRegistrar characteristics:***

- handles even the largest courses (up to 2,600 students),
- uses variable length records for compact files,
- user-defined fields and formats,
- user-defined column headings,
- convenient manual and automatic backup,
- open-ended usage with other applications,
- requires 128K ROM (Mac 512KE or larger),
- adheres to Macintosh User Interface,
- supports ImageWriter and LaserWriter, and
- works with Switcher and Multifinder.

## **Summary of Steps**

### **1. Create Course File of Student Records**

Small Courses: Create new course file (Course Information, Password);  
Create student records (New Record, enter student names and other student information)

Large Courses: Create new course file from machine-readable Registrar file (Import From Registrar, Password); add miscellaneous student information as desired.

### **2. Define Fields and Enter Grades**

Create user-defined data fields for grades and term results (Change Headings, New Global Items, Format, Average Format, Grade Format).

Small: Enter grades throughout term (Search, Next, Save)

Large: Enter grades throughout term (Import from Text files, Save).

### **3. Optional Steps**

Examine records (Search, Delete Record, Field Info, Assign Comment, Create Graph, About Student, Archives, etc.); sort and print summaries (Rank, Sort, Print Sorted Lists, Fonts); print all or selected student records (Print Student Record, Fonts); post class lists using Internal ID.

Small: Update class lists via keyboard

Large: Update class list using machine-readable Registrar file (Import, Archives); transfer data to other applications for analysis.

### **4. Term Grades**

Calculate term grade (About Student, Show Template, Drop Lowest, Weights, Calc. Average, Calc Grade); print and distribute term summaries for student verification; post term summary using Internal Student Identification (Print Sorted Lists); print archival copy (Print Sorted Lists or Print Student Records).

Small: Send printed results to Registrar

Large: Send terms results to Registrar in machine-readable form (Export to Registrar).

## 1.1 Data Entry and Storage

Fig 1.1 depicts the initial template of a typical student record. You can include up to 2,500 records in a single course file.

Intro to Computing in AE									
Name:		CUID:			SSN:		TA:		
IntID:	Cl:	Col:	Lec:	Lab:	Sec:	Credit:	GrOpt:		
No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average	
1									0.0
2									Grade  Students 1
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

Fig 1.1 Student record format

The top portion of the screen contains the student information supplied by the Registrar—course name, student name, identification number (CUID), social security number (SSN), student's class (Cl), student's college (Col), lecture number (Lec), lab number (Lab), and section number (Sec); the number of credits (Credit); and the grading option (GrOpt). You provide the teaching assistant, section leader, paper grader, etc. (TA), and the internal, course-specific identification number (IntID), which is generated automatically. The information from the Registrar can be entered by keyboard or read from a computer file.

The remainder of the screen displays the information you enter during the term. The data is organized into six user-named columns of an arbitrary number of rows. Since initially only 14 rows appear (Fig 1.1) the vertical scroll bar at the left is inactive.

Only those grade entry fields (shaded in the large region at the bottom left of the screen in Fig. 1.2) which you select from the columns will accept data and be stored on disk; the choice of fields need not necessarily be the same for every student although that typically is the case. Initially, only one field in each column is active. You can add fields just below the last field in a column.

Fields for calculated values, e.g., class ranks, weighted average, and course letter grade, are located at the bottom right of the screen. You can edit these fields also. The scroll bar located at the extreme bottom right corner of the screen provides one means of paging through the collection of student records. In addition, command keys allow you to view the first, last, next, and previous records of the ordered list. You can perform random searches via a menu of student names or by typing the initial letter or letters in a student's name or identification number.

You can add a descriptive note for each grade entry field in the template (Fig 1.2). For example, you may wish to indicate the pages or topics covered for each entry. This description is the same for a given field on every student record. In addition, you can associate comments with up to five fields in each student record; in Fig 1.2 at the bottom of the **Field Info** window we have tagged the highlighted (boldface) grade as a makeup grade. HW4 appears in boldface and also has an associated comment.

File Edit View Record Scores Special Windows

AE151

Name: Dough, John      CUID: 306446    SSN:      TR: jrc  
 IntID: 21883    Cl: 1    Col: 2    Lec:    Lab:    Sec: 1    Credit: 2    GrOpt:

No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average
1	<b>92</b>	8.0	55	.....	70	80	34	<b>0.0</b>
2	96	7.5						<b>Grade</b>
3	100	18.5						<b>0.0</b>
4	<b>88</b>	11						<b>Students</b>
5	93							<b>48</b>
6	100							
7	.....							
8	.....							
9	.....							
10	<b>Field Info</b>							
11	pp 10-44							
12	Absent makeup							
13								
14	.....							

Student

Fig 1.2 Field info and comments

Data entry follows the Macintosh user interface standards familiar to all Macintosh users. Use the mouse to select a field (i.e., make a field appear with white characters on a black background, indicating it is ready to accept input). The usual word processor editing capabilities apply here.

If you wish to add a new record, select **New** from the **Record** menu or press command R to save the current record to disk and to place a blank record template on the screen.

Free-form text (Fig 1.3) may also be associated with each student's record. Use the scroll bar to select a record. If you add or delete student records, click **Update** to make the list in this scroll window consistent. The **Print** option allows you to print all text records or just those which are not empty.

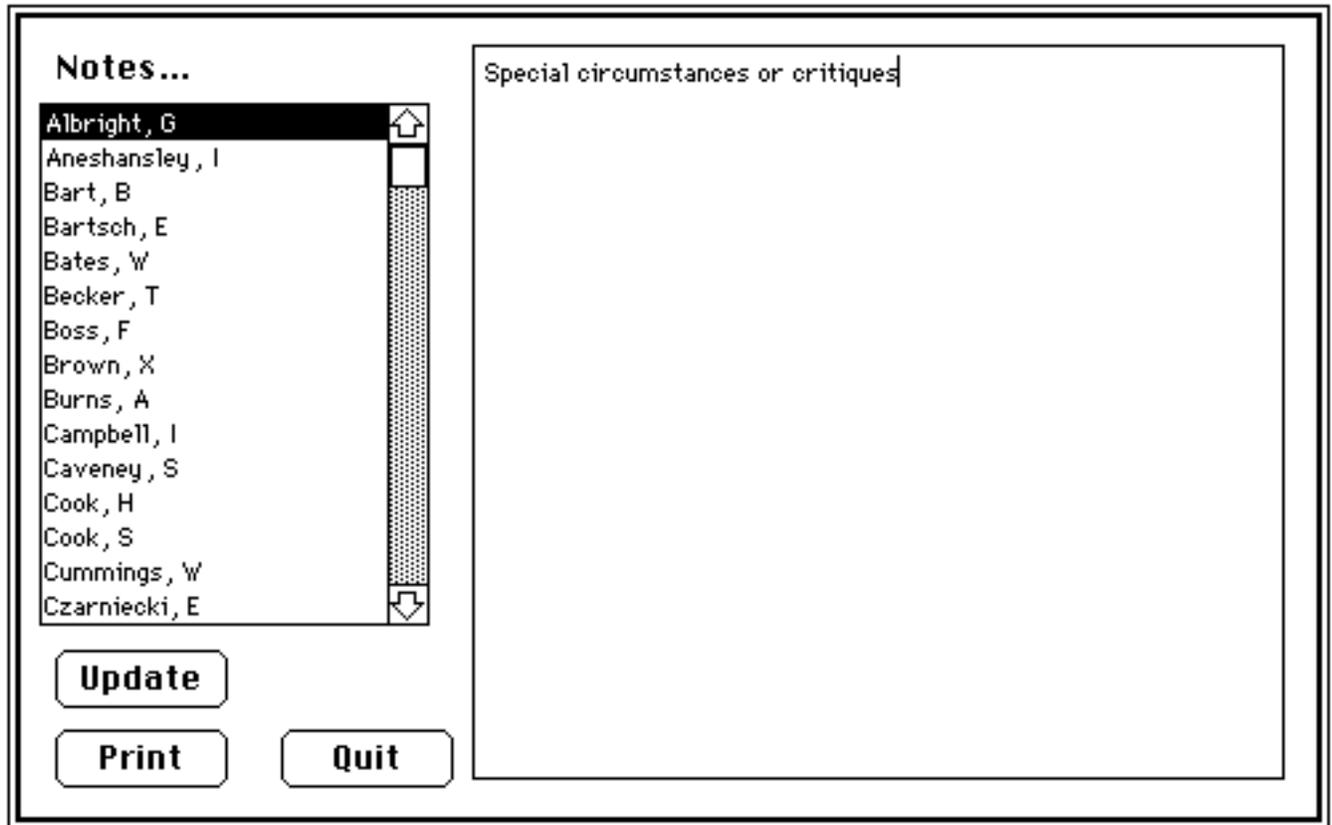


Fig 1.3 Free-form notes for each record

## 1.2 Data Manipulation and Output

In subsequent sections we present the techniques for calculating class ranks, weighted averages, and final letter grades. You can route text and graphical output to the screen, to a printer, or to a file.

There are five principal categories of MacRegistrar output:

- 1) A composite of all information in each record for each student (Fig 1.1) for student verification or for archival purposes.
- 2) Free-form notes (Fig 1.3) for each student.
- 3) A subset of the fields from each record, displayed in a one-line-per-student format (Fig 1.4), and sorted for summary purposes such as posting of grades and for reviewing trends.
- 4) Standard text files (Fig 1.5) which you can manipulate in a word processor or by other standard applications or by a program which you create.
- 5) Graphical and statistical results (Fig 1.6 and 1.7).

Sorted List			
Name	Hw 1	Hw 2	
Albright, G	67	67	↑
Aneshansley, I	77	86	
Bart, B	61	51	
Bartsch, E	95	55	
Bates, W	64	95	
Becker, T	84	78	
Boss, F	52	69	
Brown, X	59	50	
Burns, A	65	71	
Campbell, I	68	55	
Caveney, S	57	89	
Cook, H	95	79	
Cook, S	68	52	
Cummings, W	58	75	
Czarniecki, E	65	86	
Czarniecki, S	94	75	↓

Fig 1.4 Sorted list of selected fields

```

Albright, G           307446 058784598 1 02 01 01 01 0200 L
Aneshansley, I       310066 907645354 1 03 02 02 02 0200 E
Bart, B               311957 564654565 2 04 03 04 04 0200 L
Bartsch, E           301814 864654521 3 02 01 06 06 0200 L

```

Fig 1.5 Exported text files

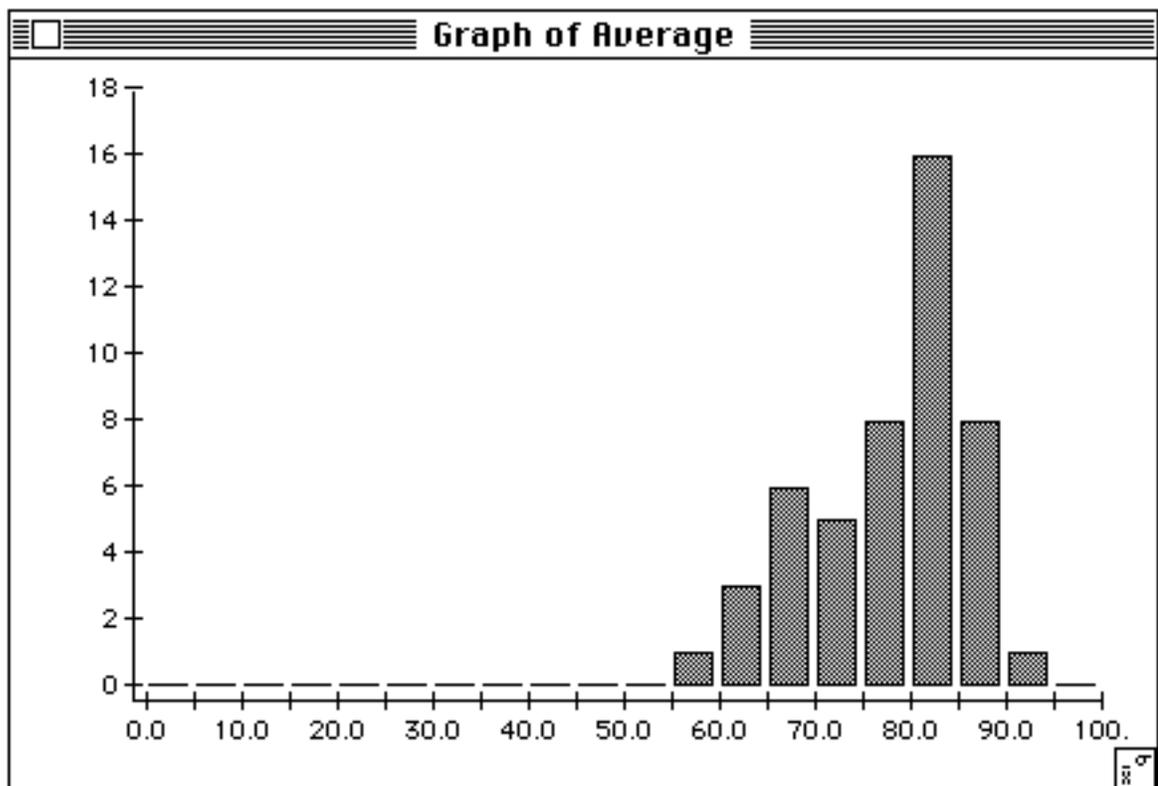


Fig 1.6 Graphical output

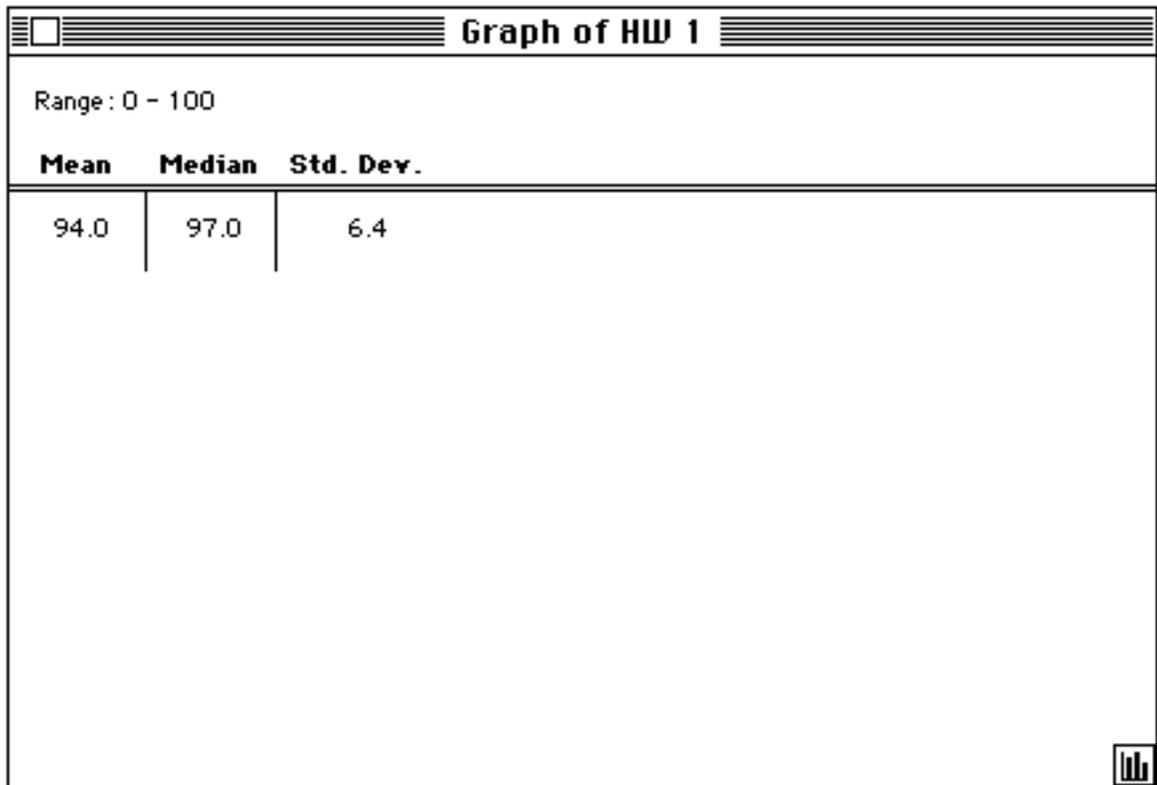


Fig 1.7 Summary values

### 1.3 Pull-Down Menus

The menu bar across the top of Fig 1.1 lists the pull-down menu options and provides a concise clue to the usage of MacRegistrar.

In general, the sequence of usage is from left to right along the menu bar.

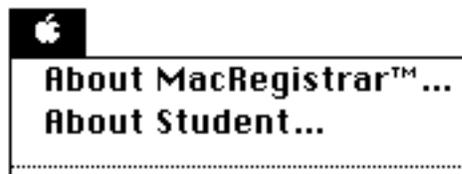


Fig 1.8 Apple menu

The menu for desk accessories is always first on the menu bar; the first item always provides information about the application. Here the copyright notice and authors are acknowledged.

concepts: J. Robert Cooke & E. Ted Sobel



Programming: E. Ted Sobel  
Manual: J. Robert Cooke & E. Ted Sobel

Fig 1.9 Copyright notice and credits

The second entry provides access to free-form text notes for each student (Fig 1.3).

As is customary, the **File** menu (Fig 1.10) provides access to the disk file system. Use this menu to create a new course file, open any of the existing course files, close an open course file, import data from another application, export data to a text file for another application using a user-defined format, specify the manner of the database usage, and print student records and sorted lists. According to the convention, **Quit** the application is the last entry.

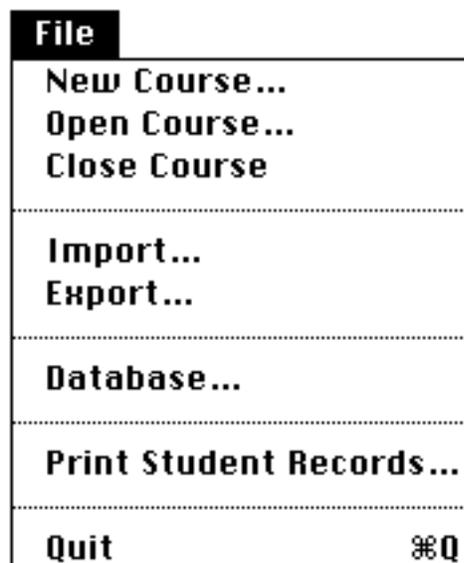


Fig 1.10 File menu

The import/export capability is a particularly important and powerful feature. You can export data to a statistical application such as DataDesk™, to a spreadsheet such as Excel™, to a graphics program such as Cricket Graph™, or to any other application which allows standard ASCII text file input. The clipboard, of course, can also be used to transfer information.

This import/export feature also makes the program open-ended. For example, if we have not included your favorite algorithm for computing the weighted average, simply export the data to your own Pascal, FORTRAN, C, or other application to handle this transformation and then import the results.

The **Edit** menu (Fig 1.11) contains the customary cut, copy, paste, and clear commands. In addition, you can extend these commands to perform the same operation simultaneously for the same grade field of all records. The undo command applies to most operations.

The program maintains an index for rapid retrieval of records. If you are a fast typist, disable the **Auto Sort** option until you have entered all records.

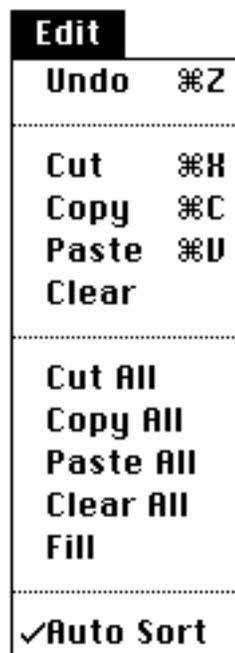


Fig 1.11 Edit menu

Use the **View** menu (Fig 1.12) to select the order of viewing records when you scroll through the class list—either alphabetically by student or by student identification number. If you select a field before scrolling, the cursor maintains correct placement for input. You can restrict either of these listings by limiting the list to specific subsets—e.g., teaching or section leader, class, college, lecture, lab, or section.

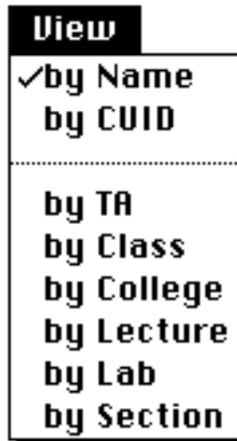


Fig 1.12 View menu

Create, delete, and search in an arbitrary order for student records using the **Record** menu (Fig 1.13). To retrieve records in index order (by name or by ID) use this menu or the command key equivalents.

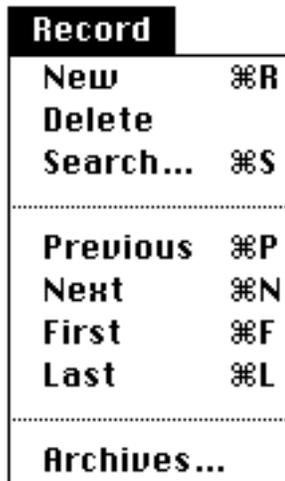


Fig 1.13 Record menu

Using the **Archives...** command, you can recover or review deleted records. Similarly, when you update your class list using files supplied by the Registrar or when you import scores from a text file created by a word processor or by a machine scoring device, MacRegistrar forms an archive file. When MacRegistrar cannot make a unique match due to a misspelled name or a mismatched identification number, it sends the suspect record to an exception file. You can retrieve, modify, or permanently purge exception file records.



Fig 1.14 Scores menu

To add new items (grade fields) at the end of any column of a record, select the last field in a column and use **New Item** of the **Scores** menu (Fig 1.14). You can also select a field at the bottom of a column and then delete it with the **Delete Item** command. Global commands apply to all existing records. If you later add students, problems in scoring may result unless **New Global Items** is applied to the added records.

The **Drop Lowest...** option permits you to drop a specified number of the lowest grades in each category when the program computes the weighted average. If you have allowed extra graded items, you can include only a specified number of the best entries in each column using the **Keep Best...** option.

Use **Letter Grades...** to associate a numerical range of scores with each of the permitted letter grades. A graphic interface facilitates this process. MacRegistrar will automatically translate numerical grades if you reformat a field.

**Show Template...** displays a composite of all fields which have been created. Each of the fields used to store grades or calculated values can be formatted with this command. Use the remaining options under **Scores** to format the field values. You can set the format for individually selected fields or for entire columns. You can use either integer or real numbers with one decimal place; letter grades can be either A+, A, A-, B+, ...F or S/U or any two characters. The computed Average field can be either integer or decimal. The final grade can be either a numerical or letter grade. You can edit the grade you calculate using the **Special** menu.



Fig 1.15 Special menu

The **Special** menu (Fig 1.15) controls the manipulation of the data—sorting, ranking, and weighted averages, including tabular and graphical output. Create customized reports by selecting the fields and their order. You can sort the output using user-selected columns such as name, identification number, rank, and weighted average fields.

This menu also includes various housekeeping chores—assigning comments for fields, changing data column headings, password and course information, as well as automatically generating a course-specific student identification number (IntID in Fig 1.1) which allows you to publicly post scores without violating student confidentiality rights.

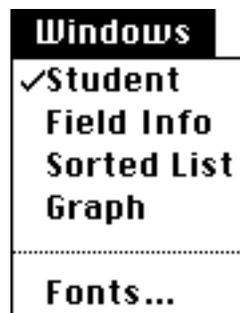


Fig 1.16 Windows menu

Use the **Windows** menu (Fig 1.16) to bring the desired window to the front, or, if active, remove it from the screen. The student template (Fig 1.2) is referred to as **Student**. Check the **Field Info** option (Fig 1.16) to display information about each field you select (Fig 1.2). **Sorted List** brings to the foreground the sorted list, provided you have created one using the **Special** menu. **Graph** brings the graphical output to the foreground if any exists. Set the font you want to use in the displays (except for the Student record screen) and printed output using the **Fonts...** option.

For experienced Macintosh users this brief overview is probably sufficient background to use MacRegistrar satisfactorily. Many additional features are described in the Reference chapter. However, less experienced Macintosh users should follow the examples in Chapter 2 for a detailed tour. Additional techniques which you will need to fully utilize all of the features appear in Chapter 3.

### **A Word About Data Security**

We recommend that you protect your data by making frequent backups. At frequent intervals when working with large files use the Save command on the File menu to make a precautionary backup. When you close a course file, MacRegistrar automatically makes a backup copy; if you wish to suppress this action, press the Option key when you select the Quit command on the File menu (Option-Quit).

Always close a file before leaving MacRegistrar; never simply turn the power off, as this will surely corrupt your files. If you should have a power failure while a course file is open, the backup file can be substituted for the corrupted file.

Printing a copy of the just-entered grades using the Sort command of the Special menu and the Print Sorted Lists... of the File menu provides extra protection. However, routinely keep a backup of the main file on a separate diskette. Diskette failures are very rare, but do occur.

## Chapter 2

### A Guided Tour of MacRegistrar

In this chapter we lead you through an examination of a sample data file **Intro to Agr Engr** (Fig. 2.1) included on the **MacRegistrar** distribution disk.



Fig 2.1 MacRegistrar application and data file icons

**Note:** In this manual we assume that you know how to use a Macintosh word processor and are familiar with the associated Macintosh conventions.

#### Before you begin

- **Make a copy of the distribution disk. Store the original and work only with the copy.**

If the copy becomes damaged or otherwise unusable, you can make additional copies from the uncorrupted original. Use the procedures described in your Macintosh user's guide to duplicate the original disk. If you are using a hard disk, create a MacRegistrar folder, then copy the **MacRegistrar**, **Intro to Agr Engr**, **Intro to Agr Engr.Notes**, and the **MacRegistrar ReadMe** files into the folder.

**Note:** Only archival copies are permitted by U.S. copyright law. Refer to the **About MacRegistrar™** notice in the **Apple** menu for ordering information if others wish to obtain a copy.

In the following instructions we assume that you are using the working copy in an internal disk drive. Let's assume that the computer has been powered down.

- Place the working copy of MacRegistrar in the internal drive and turn on the power switch.

After the **Welcome to Macintosh** message is replaced by the desktop,

- Double-click on the distribution disk icon, and

you should see the following (and possibly some additional files):



Fig 2.2 Distribution disk window

### **Load A Course File**

- Double click on the icon of the demo course file, **Intro to Agr Engr**.

This command activates MacRegistrar and loads the demo course file.



Fig 2.3 File menu

Alternatively, you could have clicked on the MacRegistrar icon to activate the application. Then you would have dragged to **Open Course...** on the **File** menu (Fig. 2.3), and released the mouse button. When the list of files appeared, you could have either clicked on **Intro to Agr Engr** and then on the **Open** button or just double-clicked on **Intro to Agr Engr** to bring the first record of hypothetical data to the screen.

Note: If you wish to create a new course file, close this course using **Close Course** of the **File** menu and then select **New Course**. MacRegistrar prompts you to name the new course, to provide additional descriptive information, and, optionally, to provide a password.

Intro to Agr Engr									
Name: Albright, G			CUID: 307446		SSN:		TA: PS		
IntID: 21883		Cl: 1	Col: 2	Lec:	Lab:	Sec: 1	Credit: 2	GrOpt:	
No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average	
1	67	52	████████	████████	70	66	64	64.8	
2	67	6.5						Grade	
3	65	27.6						C	
4	73	10						Students	
5	54							88	
6	87								
7									
8									
9									
10									
11									
12									
13									
14								Student	

Fig 2.4 A student record

**Modify fields in this record.**

Note: The data contained in Fig. 2.4 is called a 'record'; the individual entries in a student record are called 'fields'.

- Click in a grade "field" , e.g., Quiz 4, using the mouse.

10

A rectangle appears around the grade field, and the entry appears in white on a black background. You have now selected the field and can edit it.

- Type a new grade to replace the original value.

20

- Click outside the field to make the box disappear.

Alternatively, you can also position the flashing cursor between two characters and then backspace to remove characters to the left of the cursor, or you can also drag across text to select characters for replacement just as you would with a word processor.

<b>Edit</b>	
<b>Undo</b>	⌘Z
<hr/>	
<b>Cut</b>	⌘H
<b>Copy</b>	⌘C
<b>Paste</b>	⌘U
<b>Clear</b>	
<hr/>	
<b>Cut All</b>	
<b>Copy All</b>	
<b>Paste All</b>	
<b>Clear All</b>	
<b>Fill</b>	
<hr/>	
<input checked="" type="checkbox"/> <b>Auto Sort</b>	

Fig 2.5 Edit menu

You can modify any of the fields in this manner. The **Cut**, **Copy**, **Paste**, and **Clear** commands under the **Edit** menu (Fig. 2.5) work just as you would expect from your word processor experience. The companion commands **Cut All**, **Copy All**, **Paste All**, and **Clear All** work exactly the same but apply to the same field in every student record in the course file, not just the visible record.

*Suppose you wish to add another quiz grade.*

- Click on the last **Quiz** field to select the last entry in that column (shown here with its original value, Fig. 2.6).

<b>Quiz</b>
52
6.5
27.6
10

Fig 2.6 Select last entry in a column to activate **New Item** command

- Pull-down the **Scores** menu (Fig. 2.7) with the mouse and drag to **New Item** before you release the mouse button.



Fig 2.7 Scores menu

Notice that the **Scores** menu lists an equivalent keyboard command for this same action (Command I).

This illustrates the flexibility of the student record format; you can add or remove fields at the end of a column at any time.

**Format a Field**

- Pull-down the **Scores** menu with the mouse and drag to **Format...** before you release the mouse button to obtain the Format dialog (Fig. 2.8).

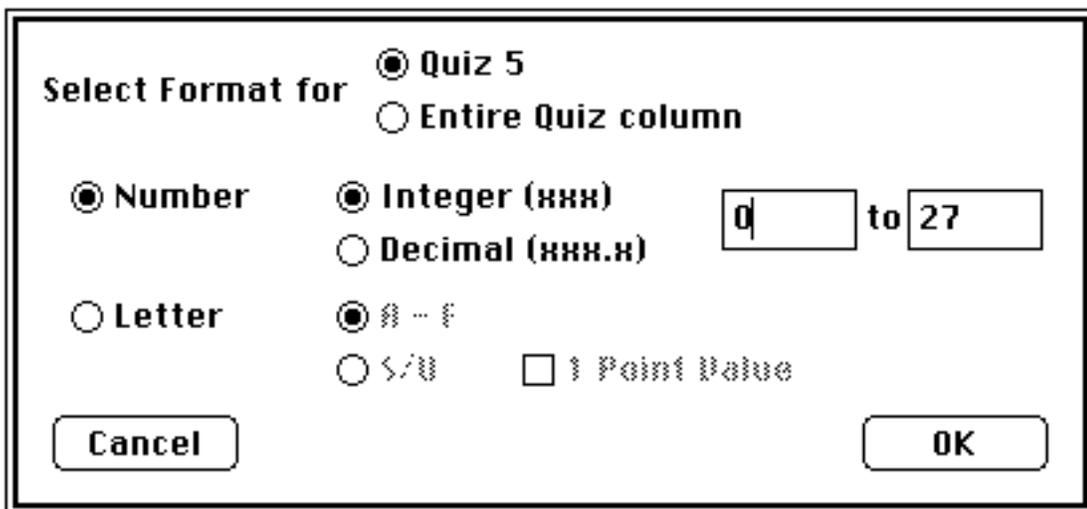


Fig 2.8 Format... command

The format of this new field is the same as the one just above it. To specify the format:

- Click on **Decimal**.

- Set the numerical range at 0.0 to 100.0.
- Click **OK**.
- Click in the new field and type a value.

If any data already exists in this field, MacRegistrar gives you an opportunity to erase or to convert automatically the existing data to conform to the new format. The program translates the numerical entries to letter grades as specified by the **Letter Grades** translation table established using the **Scores** menu.

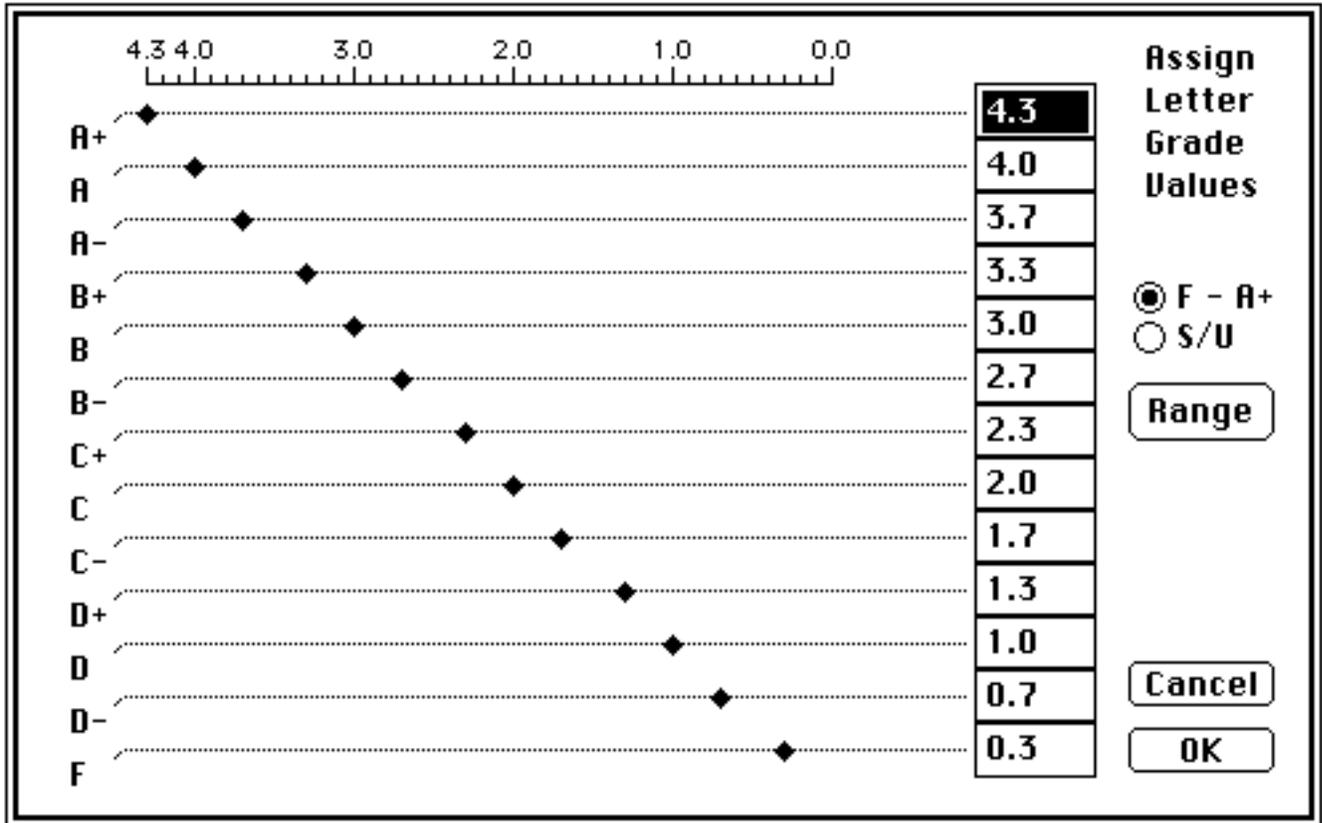


Fig 2.9 Letter Grades translation table

***Remove a field***

To remove the field that you just added:

- If that field is not still selected, select it now, then
- Pull-down the **Scores** menu with the mouse and drag to **Delete Item** before you release the mouse button.

Quiz
52
6.5
27.6
10
██████████

Fig 2.10 Delete Item example

You can remove only the last field in a column. However, you can repeatedly remove the last field until only one field in a column remains.

**Examine the next record.**

- Click once on the right arrow at the bottom right corner of the screen (Fig. 2.11).



Fig 2.11 Record scroll bar

The next record appears momentarily. Clicking in the gray area to the right of the box in the scroll bar advances ten records, just as if you had clicked the arrow ten times. Drag the box to a new location to scroll even faster.

Keyboard equivalents to **Previous**, **Next**, **First**, and **Last** (command P, command N, command F, and command L) on the **Record** menu also allow you to choose the record you wish to see.

Record	
New	⌘R
Delete	
Search...	⌘S
-----	
Previous	⌘P
Next	⌘N
First	⌘F
Last	⌘L
-----	
Archives...	

Fig 2.12 Record menu

Table 2.1 Keyboard commands

Command	Action
Q	Quit
Z	Undo
K	Cut
V	Paste
R	New Record
S	Select
P	Previous
N	Next
F	First
L	Last
I	New Item
M	Format

**Scroll Filter.**

If your class has meaningful subdivisions of TA, Class, College, Lecture, Lab, or Section, you can limit the scrolling to each of the categories within these fields.

- Pull-down the **View** menu with the mouse and drag to **Section** before you release the mouse button.

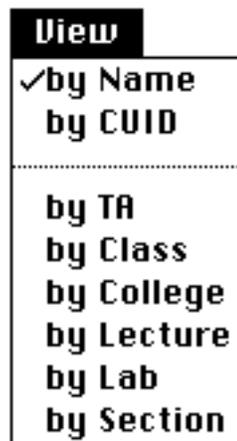


Fig 2.13 View menu

MacRegistrar asks you to approve the sorting of the file by this grouping (Fig. 2.14).

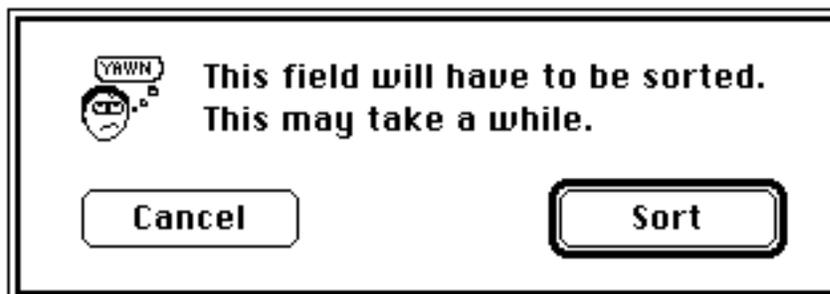


Fig 2.14 Sort confirmation message

- Click on the Sort button.

Note: If a large number of records were to be sorted, a progress indicator would also appear.

- Examine the View menu to verify that **Section** is outlined indicating the existence of an index for quick access.

The dot to the left of **Section** means that this is also the index in use.

Note: MacRegistrar can store this index with your course file, even after you close the file. Any addition or deletion of records destroys the index, and the outlining on the **Section** option of the menu disappears.

Also note the presence of a double-headed scroll arrow near the record scroll bar (Fig. 2.15). The text on the shaft of the arrow also indicates that the **Section** index is active.

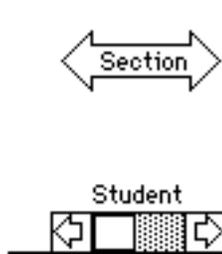


Fig 2.15 Scroll filter selector

When you click on the student scroll bar while this filter is active, only student records from the current section appear.

- Click on the right-hand end of this scroll arrow to select the next sub-category within Section.

Note that the displayed record shifts to show a record from Section 2. Repeated clicking of either arrow head causes the subcategory to change in a cycle. If you wish to see all categories listed at once:

- Click on the shaft of the arrow.

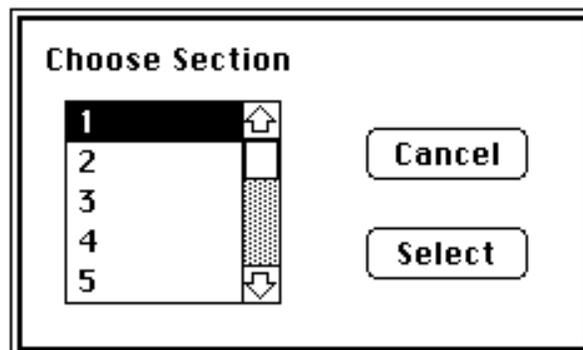


Fig 2.16 Subcategory selection

A menu of subcategories appears (Fig. 2.16):

- Use the scroll bar to examine the entire menu list.
- Click to select a category.
- Click on **Select** to choose one.

Note: The last two actions can be combined into a double-click.

When you scroll through the list of records using **Previous**, **Next**, **First**, **Last**, MacRegistrar now presents only those records which meet the subcategory you just established.

- Click again on **Section** in the **View** menu (Fig 2.13) to remove the filter.

Note: You can retrieve student records on the basis of CUID number. When you select by **CUID** on the **View** menu, then **Previous**, **Next**, **First**, and **Last** refer to the CUID numerical ordering of the index.

You can locate records in any order using the **Search** option of the **Record** menu. Command S is the keyboard equivalent for this command.

#### **Select an arbitrary record.**

- Pull-down the **Record** menu with the mouse and drag to **Search...** before you release the mouse button (Fig. 2.17).

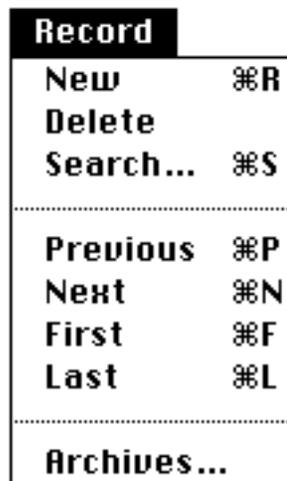


Fig 2.17 Record menu

The three dots after **Search...** indicate that you must supply additional information to complete the command. Once more you have several alternatives.

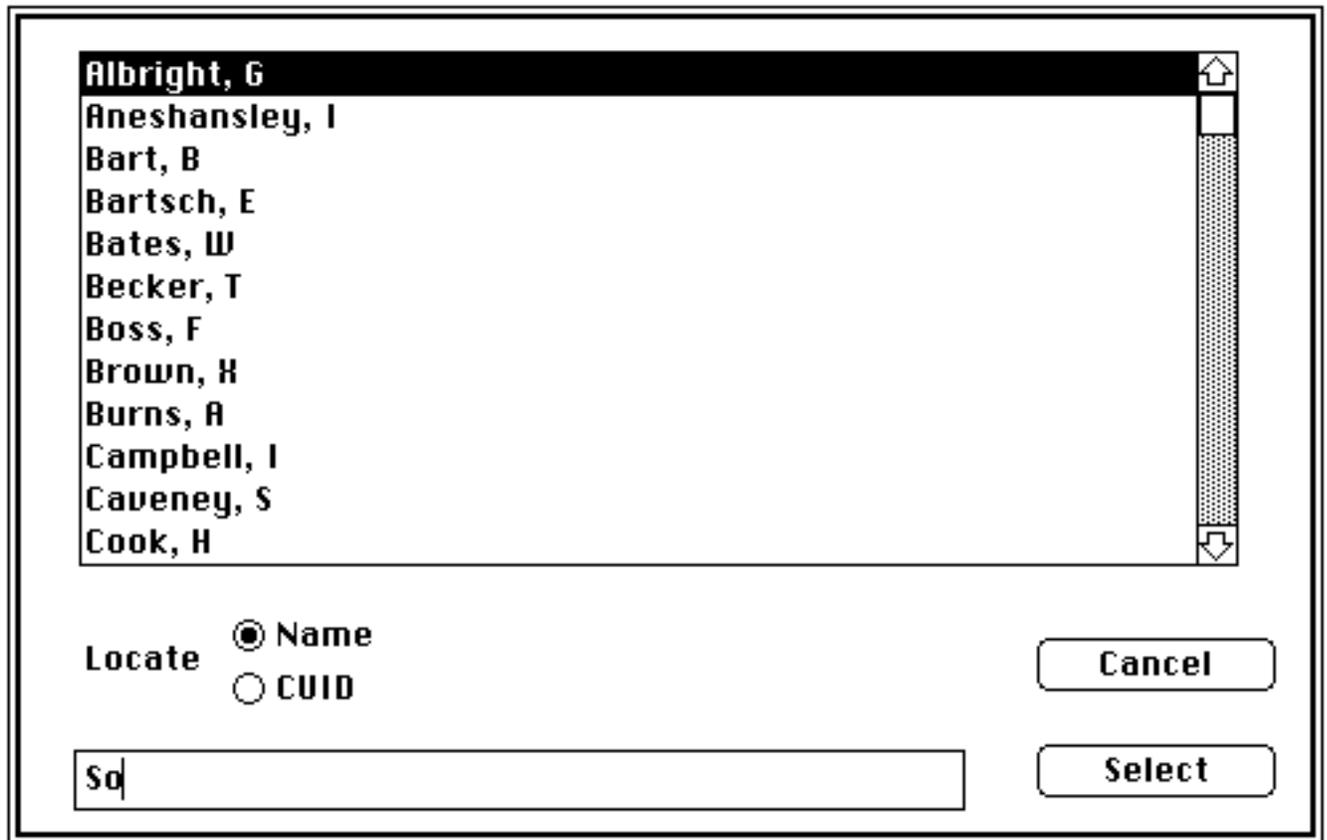


Fig 2.18 Selection window

- Type **So** and press *Return*.

Note: *Return* accepts keyboard entries; **Select** accepts scroll bar entries.

- Double-click on **Sobel, O** to select that record.

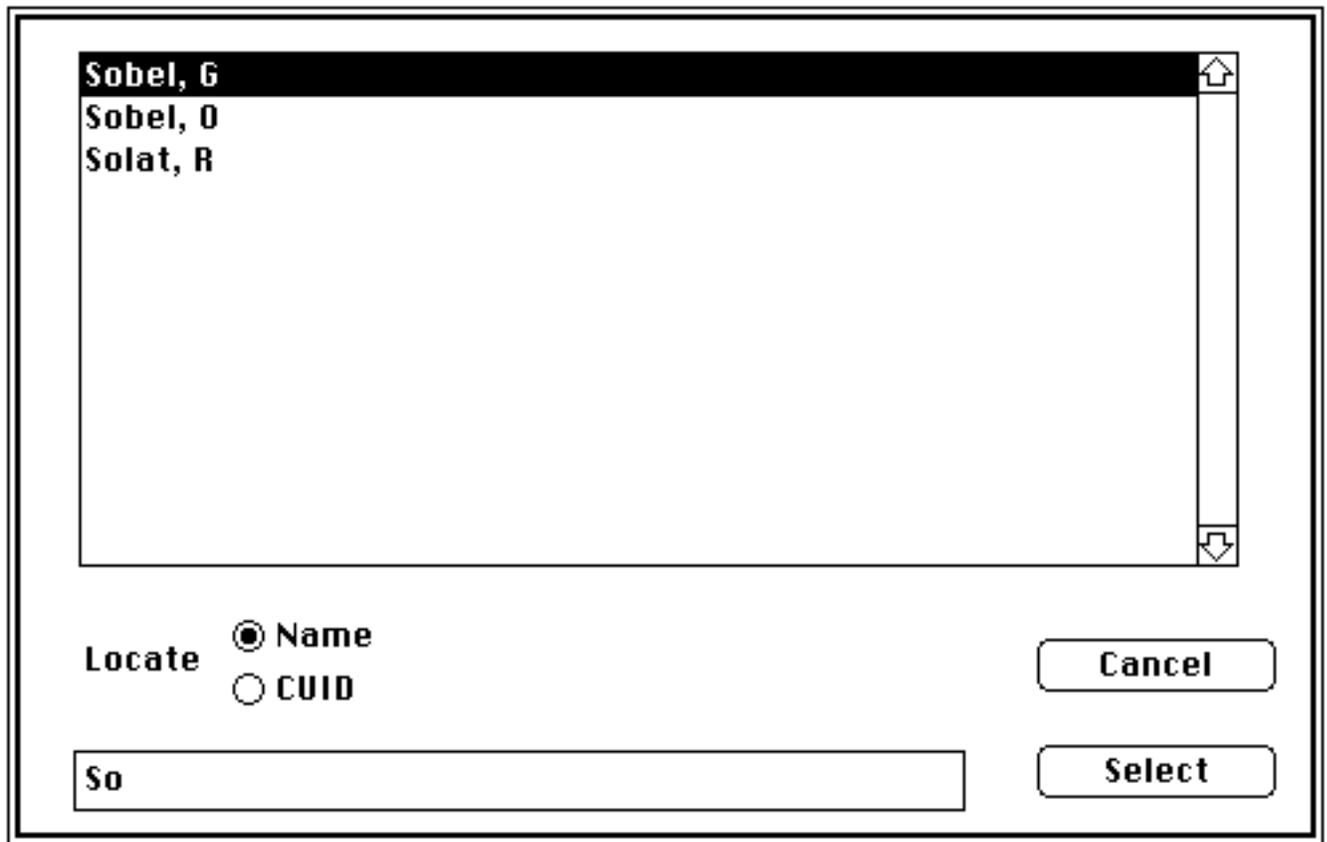


Fig 2.19 Filtered list of names

Note: If you type enough characters to uniquely locate a record, MacRegistrar bypasses the above screen.

Alternatively, you could have clicked on **Sobel, O** and then on **Select**.

***Just for practice locate another record using another technique.***

- Type command S to obtain the menu of names.
- Use the scroll bar at the right to find the name of the student whose record you wish to retrieve, e.g., **Speicher, M.**

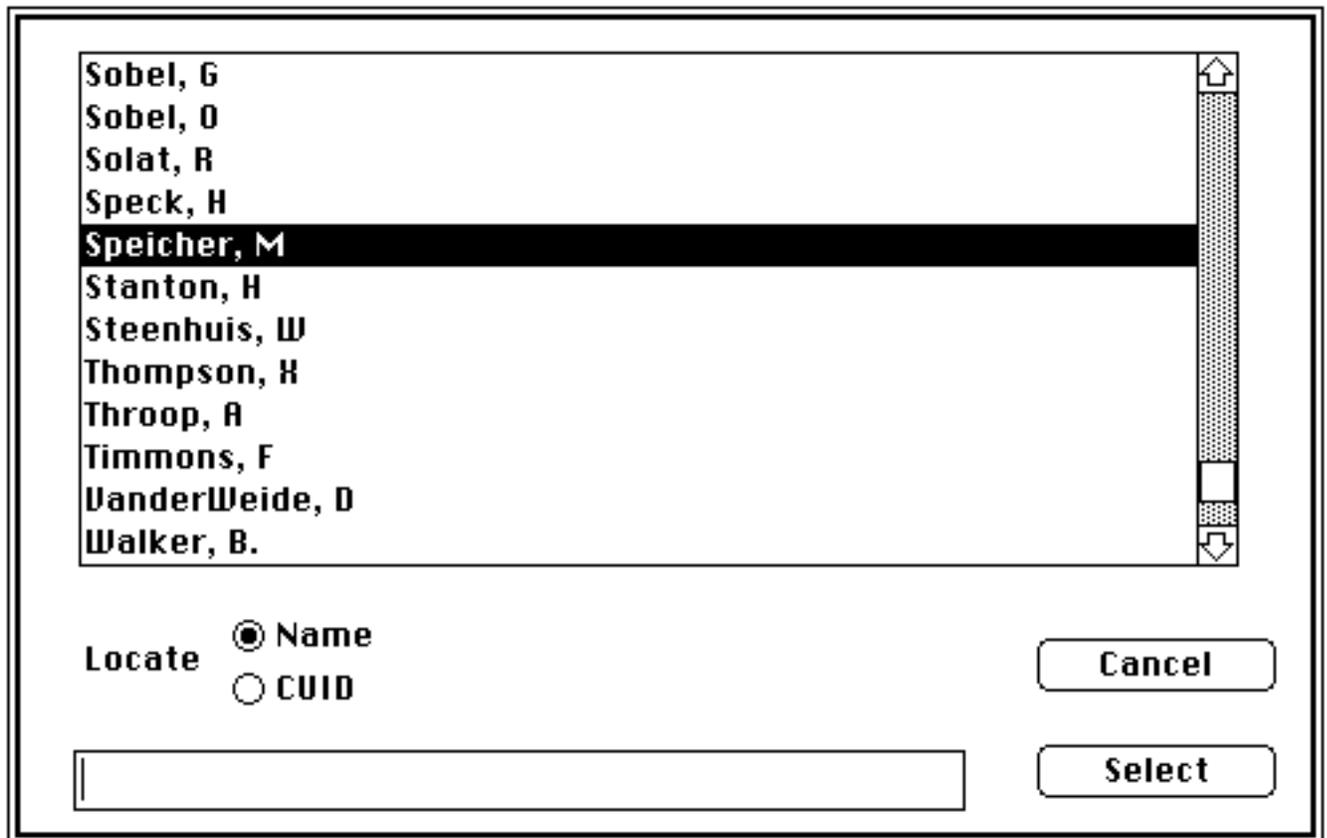


Fig 2.20 Scroll and double-click to select

- Double-click on the desired name when it comes into view to retrieve the record.

Notice that the cursor remains in the same field as you select different records. This expedites the grade entry process.

Note: Use **New** (command R) under **Record** to add an additional student record; **Delete** (intentionally without a keyboard equivalent) removes records. Try it.

Note: MacRegistrar saves deleted records in a delete file. You can retrieve or permanently remove them using **Archives...** of the **Record** menu.

If you are a fast typist:

- Turn off the automatic indexing by dragging to **Auto Sort** in **Edit**.

Remember to re-activate the indexing when you have entered all records.

Notice that two fields (**Lab** and **Paper**) are represented by grey rectangles. These fields are currently available but contain no data.

**Assume that “Project” is a better description of an assignment than “Paper”. Rename the “Paper” column, calling it “Project”**

- Pull-down the **Special** menu with the mouse and drag to **Change Headings...** before you release the mouse button (Fig. 2.21).



Fig 2.21 Special menu

- Click in the rectangle at row 4 after the **r** in **Paper** (Fig. 2.22), backspace to delete this heading, and then enter the new heading (Fig. 2.23).

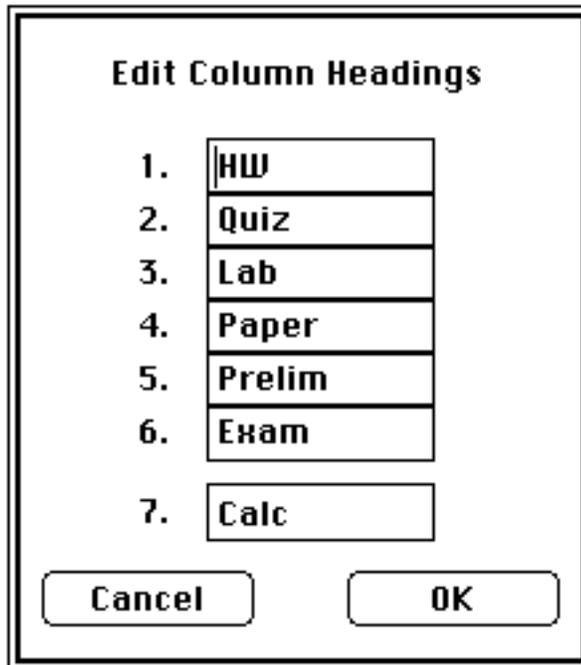


Fig 2.22 Change column headings

3.	Lab
4.	Project
5.	Prelim

Fig 2.23 Edit heading

Note: You can use the dragging technique to select the entire contents of this entry. Once you have selected the entry, any typing deletes the current contents.

- Click **OK** when you have satisfactorily made your change or click on **Cancel** if you change your mind.

### ***Saving data***

**Note: MacRegistrar uses a combination of disk-based and RAM-based storage. File saving is automatic as soon as you perform an operation. However, MacRegistrar does not write the end-of-file markers and the resource map until you close the course file. The course file size can exceed RAM limitations but cannot exceed 2,600 records.**

**ALWAYS close the file before you turn the power off.**

### ***Examine the other Windows.***

So far we have been examining the contents of complete records. The **Windows** menu (Fig. 2.24) provides three other views of the data.

Suppose you wish to attach a note to each field to remind you of the material covered and the date of the exercise.

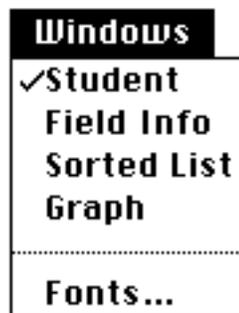


Fig 2.24 Windows menu

### ***Commentary***

- Pull-down the **Windows** menu with the mouse and drag to **Field Info** before you release the mouse button.

A movable, but not re-sizable, window appears (Fig. 2.25).

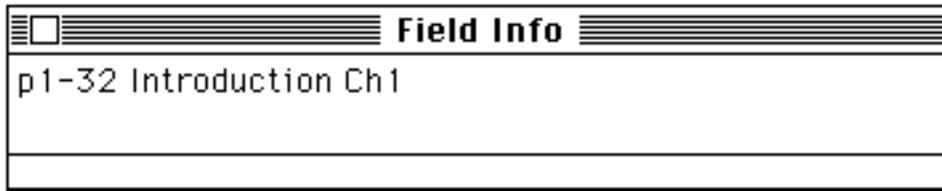


Fig 2.25 **Field Info** window

- Place the arrow cursor on the ruled title bar of the **Field Info** window.
- Drag (keep the mouse button pressed while moving the cursor) the window to the bottom of the screen to avoid masking the top of the **Student** window.
- Click on a grade field, e.g., HW 1, and the **Field Info** window behaves as a word processor window.
- Type an identifying message, e.g., 'p1-32 Introduction Ch1'.
- Click in any other field to repeat this process.

Anytime you click on a field when the **Field Info** window is visible, the message you entered appears.

- Click in the small square box at the top left of the **Field Info** window to close this window. Alternatively, again select **Field Info** from the **Windows** menu to move this window from view.

MacRegistrar allows an additional level of annotation. You can enter up to five (5) stock messages that you can assign to grade fields. This number should be sufficient for most situations; the number was deliberately kept small in order to preserve the compact file structure.

- Pull-down the **Special** menu (Fig. 2.26) with the mouse and drag to **Assign Comment...** before you release the mouse button.



Fig 2.26 Special menu

- Assign messages to these entries, e.g., illness, University travel, religious holiday, excused, optional project (Fig. 2.27).

You can use these messages with any record in the course file. Once you have used an item, any subsequent changes apply to all of the records, not just the current record.

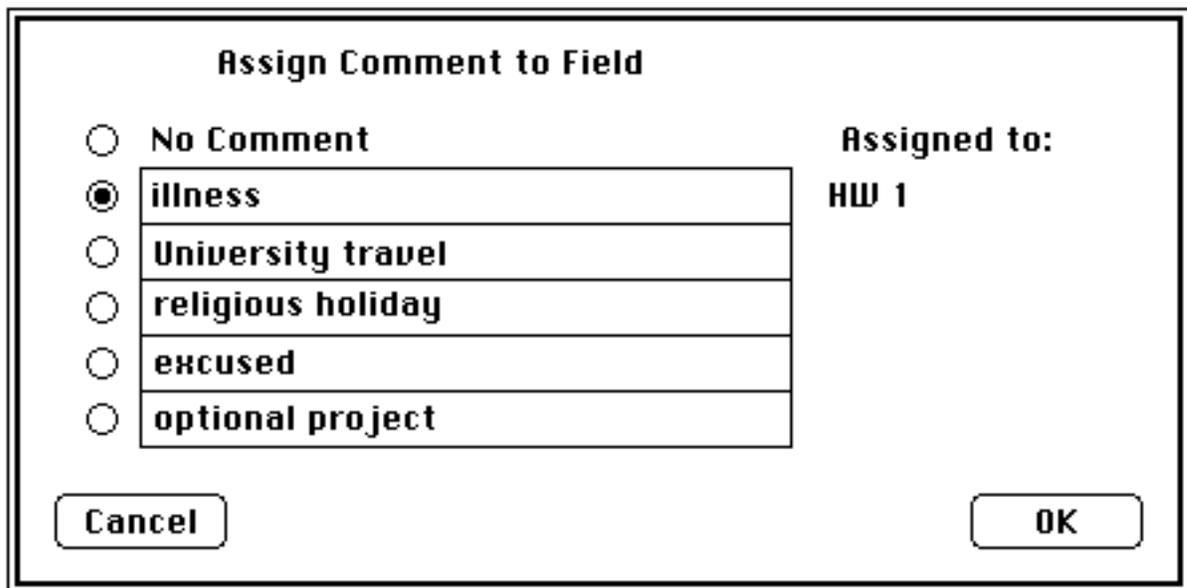


Fig 2.27 Assignment of comment choices

- Click **OK** when finished.

***Assign comments to two fields of the current record.***

- Click on HW 1 (You must click in a field to enable the following procedure.)
- Pull-down the **Special** menu (Fig. 2.26) with the mouse and drag to **Assign Comment...** before you release the mouse button.
- Click on the radio button adjacent to the appropriate message.

Note: You can select only one of a set of radio buttons, just as the push-buttons on a car radio allow the selection of only one station at a time.

- Click **OK** to close the Comment window.

*Let's examine the results of your efforts.*

With the HW 1 field still selected,

- Pull-down the **Windows** menu (Fig. 2.28) with the mouse and drag to **Field Info** before you release the mouse button.

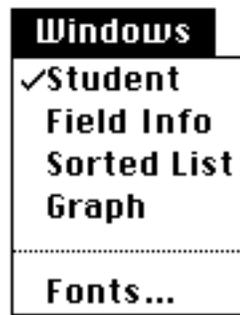


Fig 2.28 Windows menu

If necessary, move the **Field Info** window to a non-used part of the screen. The bottom line of the **Field Info** window now displays the comment.

- Click outside the **Field Info** window to de-select the grade field with which this message is associated.

Notice that **HW 1** now appears in boldface type (Fig. 2.29) to indicate that a comment has been associated with this field. You can tag up to five (5) such fields in each student record with one of these stock messages.

	No.	HW	Quiz
↑	1	<b>67</b>	52
	2	67	6.5

Fig 2.29 Boldface indication of commented entry

- Click the close box of the **Field Info** window.

**You can save detailed commentary on each record.**

- Pull-down the **Apple** menu (Fig. 2.30) with the mouse and drag to **About Student...** before you release the mouse button.

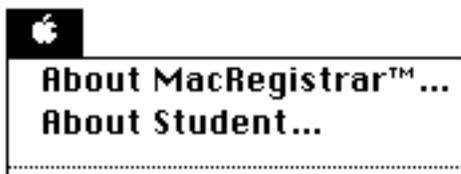


Fig 2.30 Free-form text **About Student...** where records can be stored

Use the scroll box to access the free-form text you create for each student. Critiques of essays or special circumstances can be noted here (Fig. 2.31). This information can be reviewed when the course grade is being assigned.

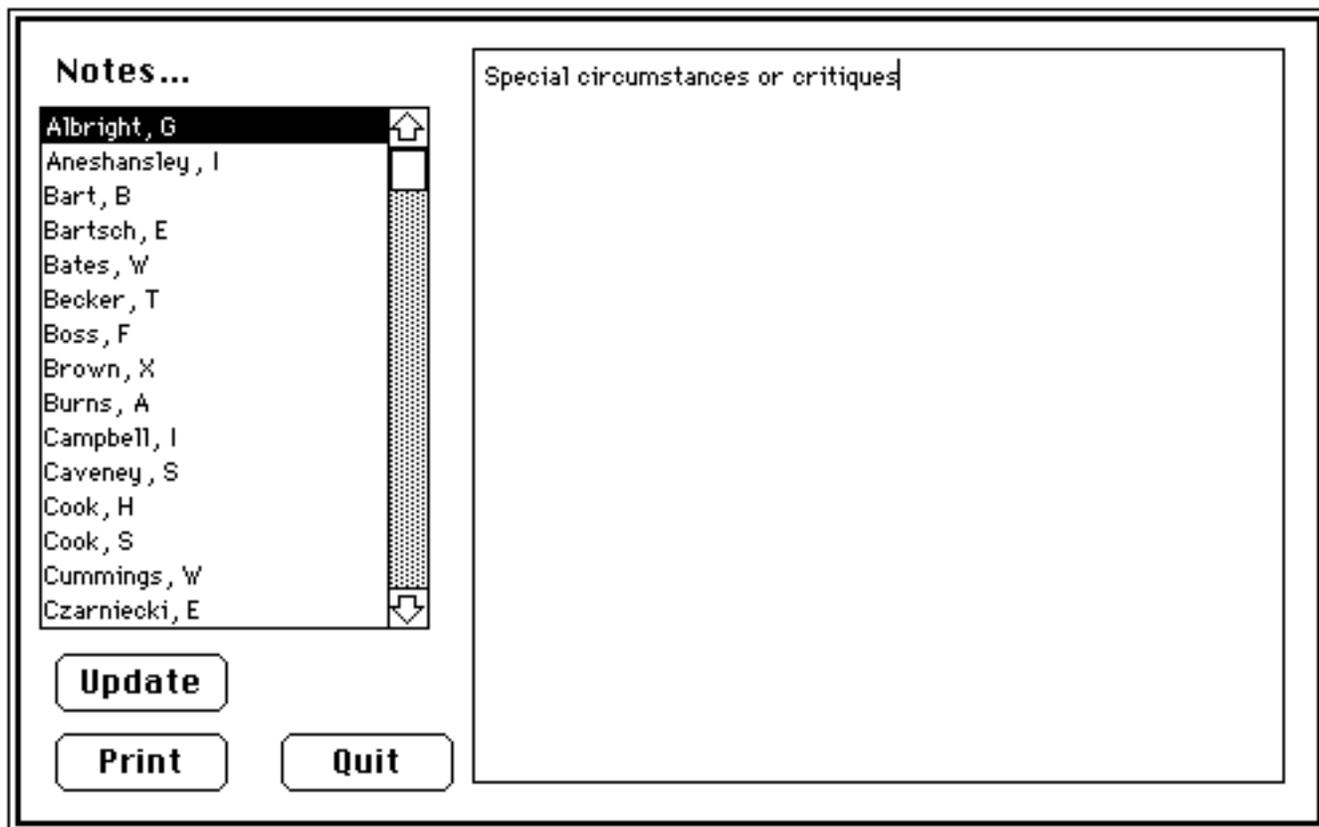


Fig 2.31 Text, (e.g., paper critiques, special circumstances) can be filed

**Interesting and meaningful patterns often emerge from the data if viewed appropriately. Let's look at some sorted lists.**

- Pull-down the **Special** menu with the mouse and drag to **Sort...** before you release the mouse button.

To assist in the selection of the fields for listing and sorting, the following screen appears (Fig. 2.32):

**Select Fields For Listing and Sorting**

Name:  CUID:  SSN:  TA:

IntID:  Cl:  Col:  Lec:  Lab:  Sec:  Credit:  GrOpt:

No.	HW	Quiz	Lab	Project	Prelim	Exam	Rank	Average
1	<input type="checkbox"/>							
2	<input type="checkbox"/>	<input type="checkbox"/>						
3	<input type="checkbox"/>	<input type="checkbox"/>						Grade
4	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>						Students
6	<input type="checkbox"/>	<input type="checkbox"/>						88
7								
8								
9								
10								<input checked="" type="radio"/> List
11								<input type="radio"/> Sort
12								<input type="button" value="Cancel"/>
13								<input type="button" value="OK"/>
14								

Fig 2.32 Window for selection of fields and sorting order

To display sorted lists, select the fields you want to appear on the screen and then select the fields you want to sort.

**Select the fields to appear in the report**

At the bottom right of the above figure (Fig. 2.32), List appears as the default.

- Click in the fields (Fig. 2.33) to designate the left-to-right ordering of the fields you wish to list on each line of the output sent to the screen.

The line length appears across the top of the screen. If you include more fields than the screen can display, the small arrows at the top-right corner of the screen permit you to see the entire list. Of course the actual sorted list requires the use of the horizontal scroll bar, too. You may wish to have the student name appear near the right of the screen so that you can see the identifying name after the scroll.

Note: To change the order of the fields in the list, simply drag the outline of a field until it coincides with the field you wish to swap. To de-select a field, simply select it again.

Name		HW 1	HW 2						
<b>Select Fields For Listing and Sorting</b>									
Name:	<input type="text" value="1"/>	CUID:	<input type="text"/>	SSN:	<input type="text"/>	TA:	<input type="text"/>		
IntID:	<input type="text"/>	Cl:	<input type="text"/>	Col:	<input type="text"/>	Lec:	<input type="text"/>	Lab:	<input type="text"/>
		Sec:	<input type="text"/>	Credit:	<input type="text"/>	GrOpt:	<input type="text"/>		
No.	HW	Quiz	Lab	Project	Prelim	Exam	Rank	Average	
1	<input type="text" value="2"/>	<input type="text"/>							
2	<input type="text" value="3"/>	<input type="text"/>							
3	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Grade	
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	
5	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	Students	
6	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	88	
7	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
8	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
9	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		
10	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="radio"/> List	
11	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="radio"/> Sort	
12	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="Cancel"/>	
13	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="OK"/>	
14	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>		

Fig 2.33 Indicator of field ordering and display width (top line)

After you have finalized the choice of fields and their sequence in the output row:

**Specify the sort order for one or more fields**

- Click on **Sort** just below **List** (Fig. 2.33).

If you wish to sort by **Section** and have the **Names** appear in alphabetical order within each section:

- Click on **Section**.
- Click on **Name**.

Note: **By Name** is the default so the last step really isn't necessary in this instance. If you sort by 2 fields, you are actually sorting by 3 since **By Name** is always defaulted.

Normally, you select the sort fields from among those you included in the listing. To change your selection of fields, click on the field a second time. You can also change the ordering of the selected fields by dragging.

- Click **OK** when you are ready to perform the sort (Fig. 2.34) or click **Cancel** to abort.

Sorted List			
Name	HW 1	HW 2	
Albright, G	67	67	↑
Aneshansley, I	77	86	
Bart, B	61	51	
Bartsch, E	95	55	
Bates, W	64	95	
Becker, T	84	78	
Boss, F	52	69	
Brown, X	59	50	
Burns, A	65	71	
Campbell, I	68	55	
Caveney, S	57	89	
Cook, H	95	79	
Cook, S	68	52	
Cummings, W	58	75	
Czarniecki, E	65	86	
Czarniecki, S	94	75	
Datta, F	79	86	
Ditmars, H	68	50	
Donohoe, B	76	61	
Duclos, N	95	81	
Etheridge, R	97	66	
Fabian, F	57	68	↓

Fig 2.34 Sorted list window

Note: Use the **Windows** menu to view the various windows. If a portion of the **Student** window is visible, you can also switch windows by clicking within the window you wish to bring to the foreground.

**Calculate class rank**

In addition to the use of a sorted listing of grades, you can produce class ranks—an additional piece of information which is often of interest to students.

- Pull-down the **Special** menu with the mouse and drag to **Rank...** before you release the mouse button.



**A graphical view of the data is often useful, as are the descriptive statistics—mean and standard deviation.**

- Pull-down the **Special** menu with the mouse and drag to **Create Graph...** before you release the mouse button. A screen similar to Fig. 2.35 appears.
- Select a field you want to plot in histogram form, e.g, HW 1.
- Click **OK**.

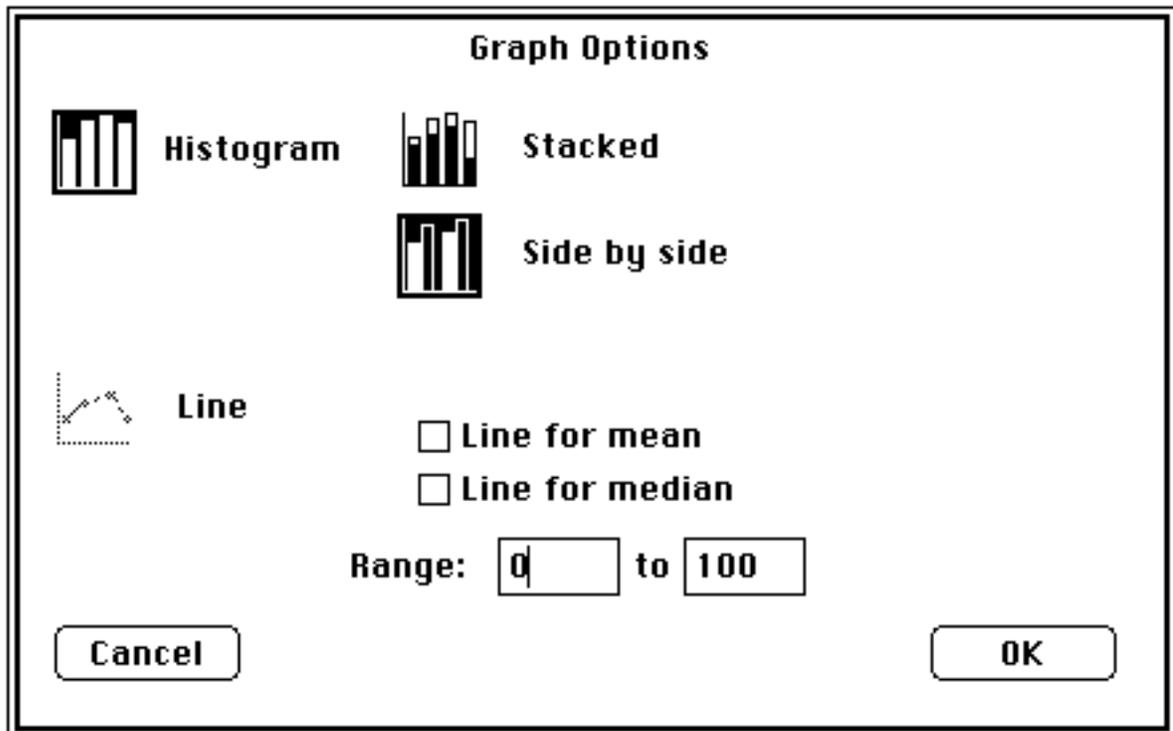


Fig 2.37 Graph options

- Accept the Histogram default by clicking **OK**.

If you also select one of the student information categories such as Class, College, Lecture, Lab, or Section, then the histogram type selection (Stacked or Side by Side) is relevant.

**Suppose you wish to compare the performance on HW 1 of the freshmen and the seniors in the class.**

- Click on **HW 1**.
- Click on **Cl**.
- Click on **OK**.

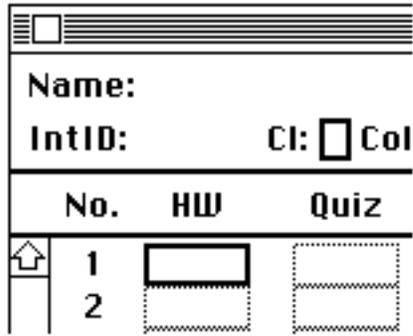


Fig 2.38 Select histogram comparisons

The **Choose** window with a scroll bar appears at the right of the **Graph Options** window.

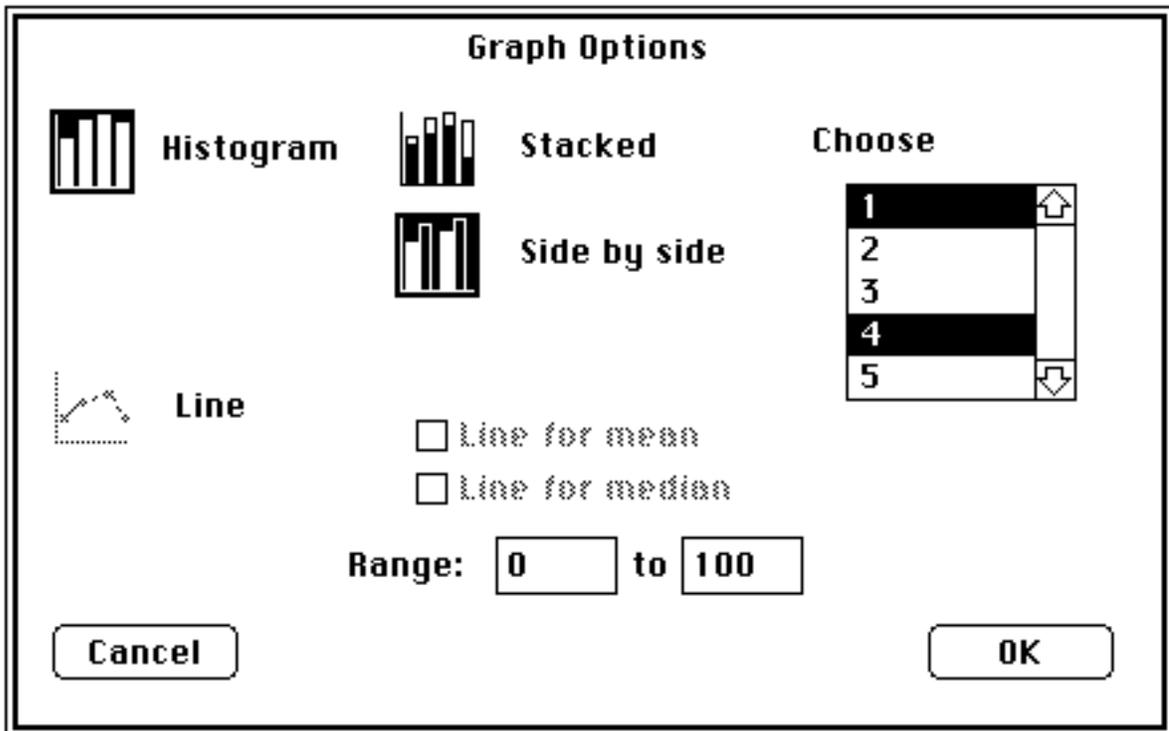


Fig 2.39 Select class comparisons

- Click on 1.
- Command-click on 4.
- Click **OK**.

**Note:** Click to select a single entry. Command-click allows you to select any arbitrary, i.e., disjoint, combination of items; shift-click allows you to select a contiguous range. You can place up to six (6) subclassifications on a single histogram.

**Note:** If you select more than six, the first six are used; if you select none, then the first in the listing is used.

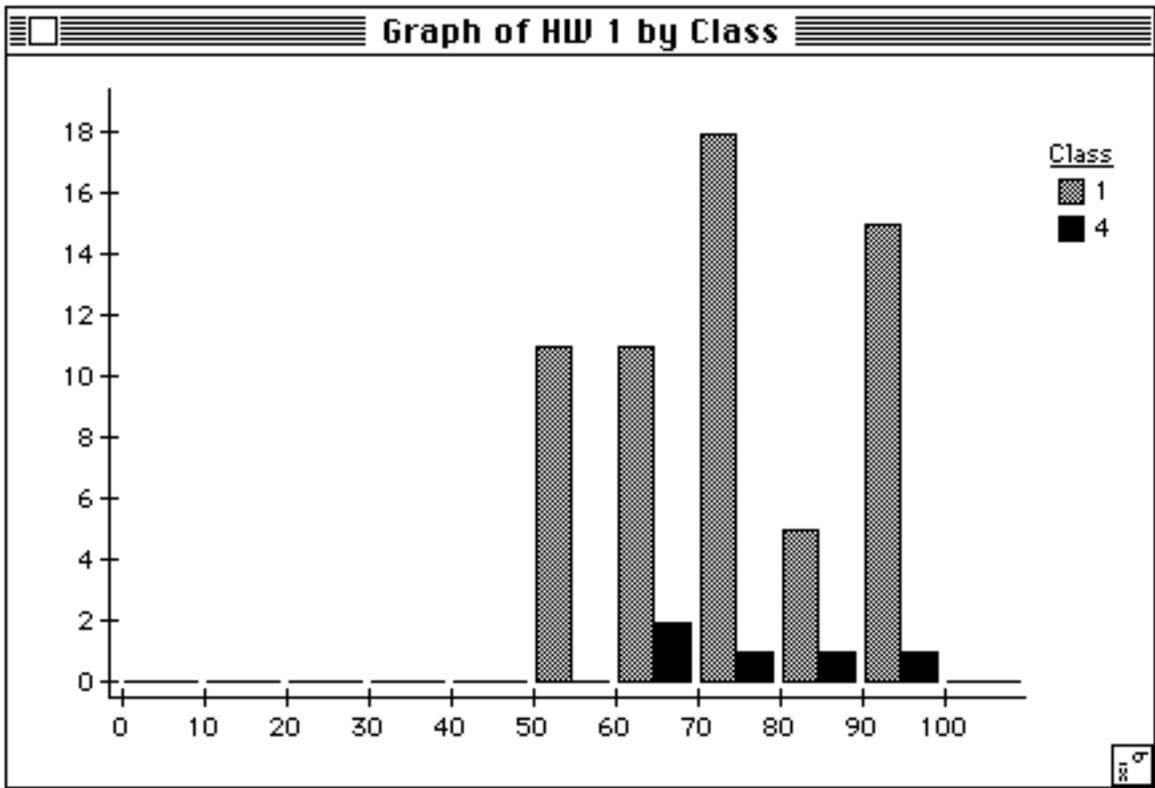


Fig 2.40 Histogram for freshmen and senior scores

You can use **Graph Options** to change the form of the plot.

You can compare scores assigned by different paper graders.

Descriptive statistics are also available if you click on the icon at the bottom right corner of the histogram (Fig. 2.40).

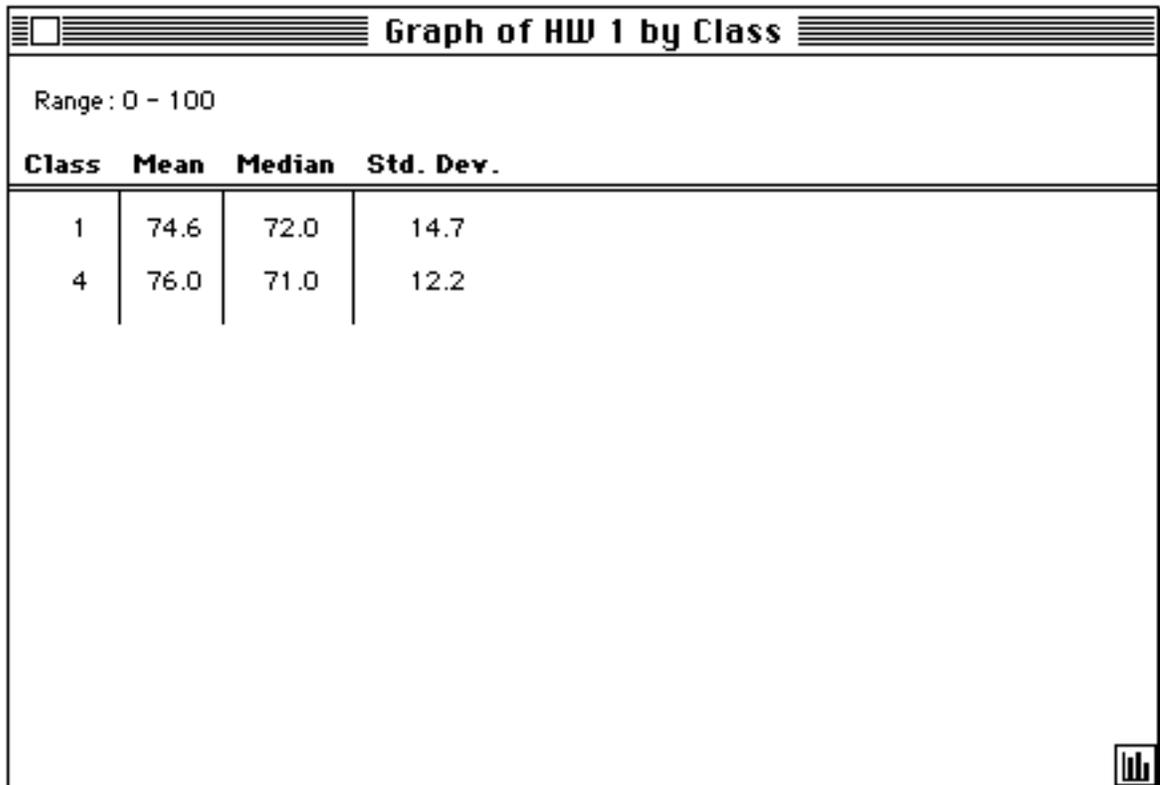


Fig 2.41 Descriptive statistics for Fig 2.40 histogram

### ***Term grades***

***Eventually you will assign a single figure of merit to characterize the student's term performance.***

Two fields have been reserved at the right of the Student screen (Fig 2.1) for the Course **Average** and for the Course **Grade**. In order to compute these values, you may need some additional commands. For example:

- Format grade fields
- Format the average field
- Format the final grade field
- Drops of lowest grades
- Set data ranges for individual grade fields
- Select weighting scheme for combining grades
- Matching numerical ranges with letter grades.

This last operation can involve a highly individualized process which often is not described explicitly or publicly. MacRegistrar supports a very flexible process.

### ***Format fields***

- Select a field, e.g., Quiz 4 (Fig. 2.4)

- Pull-down the **Scores** menu (Fig. 2.42) with the mouse and drag the cursor to **Format...** before you release the mouse button.



Fig 2.42 Format commands

You can also use *command-M*. A window for the specification of the field format appears (Fig. 2.43).

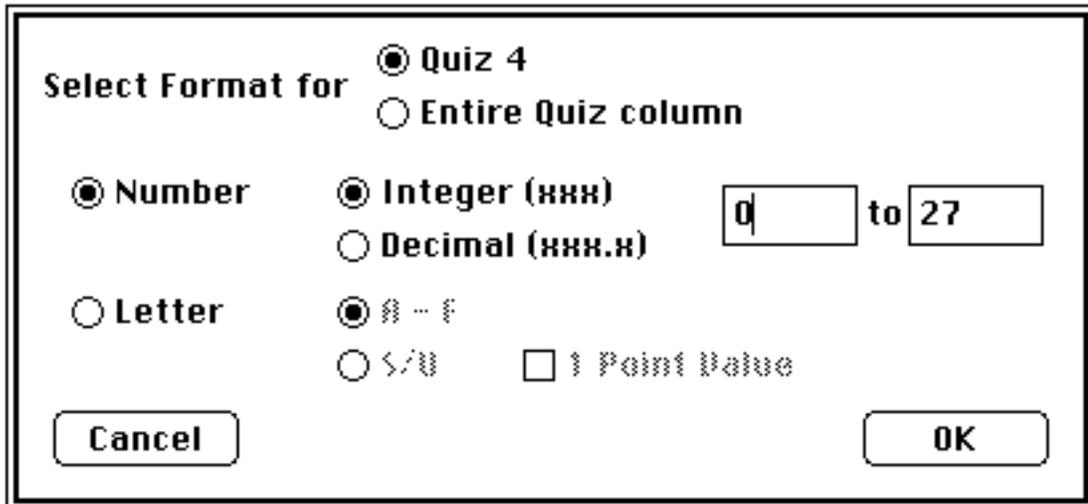


Fig 2.43 Select score format

Entries can be numbers or letters. In the case of Quiz 4, note that the field is an integer field having a range of 0 to 27. You need not record individual entries as a decimal fraction.

If you have already stored scores in the field you just selected, any change in the format can result in incompatibility. Therefore, the program asks whether it should convert (according to the relationship described in **Letter Grades...** of **Scores**) or erase the data, or whether it should abandon the proposed change (Fig. 2.44). The changes may be irreversible; therefore, think before you proceed.

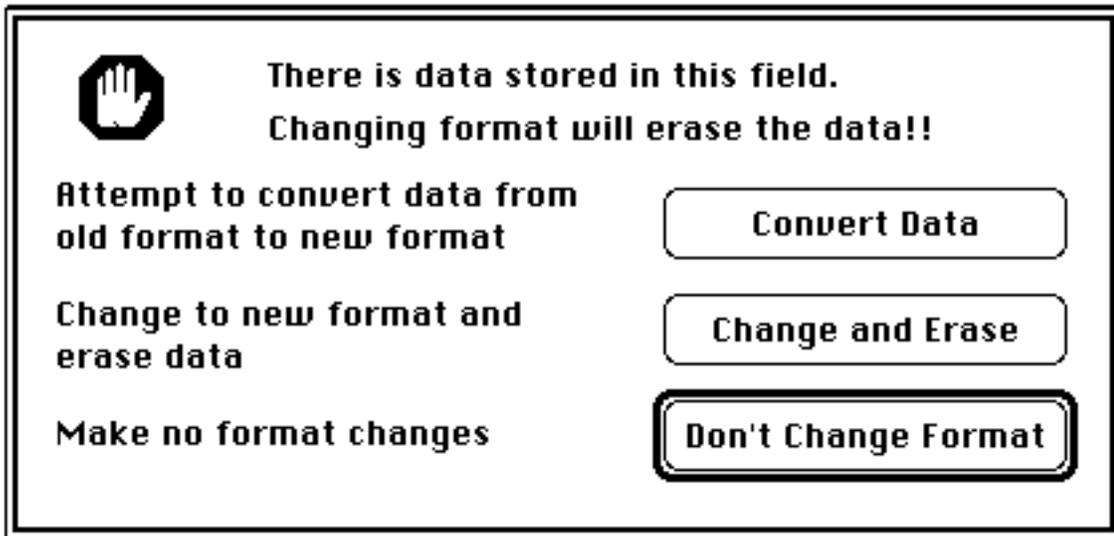


Fig 2.44 Conversion of existing score

### 2. *Average Format* (Fig 2.42)

You must format the field reserved to receive the weighted average result. Since the Average field is permanently designated, you need not select a field before you select this command.

- Pull-down the **Scores** menu with the mouse and drag to **Average Format...** before releasing the mouse button.

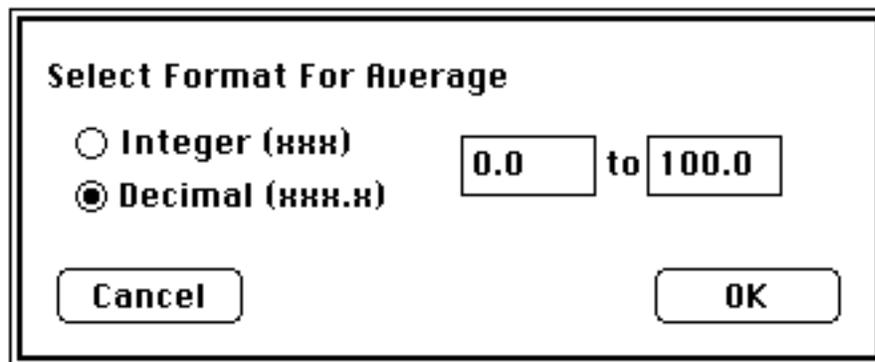


Fig 2.45 Format the weighted average field

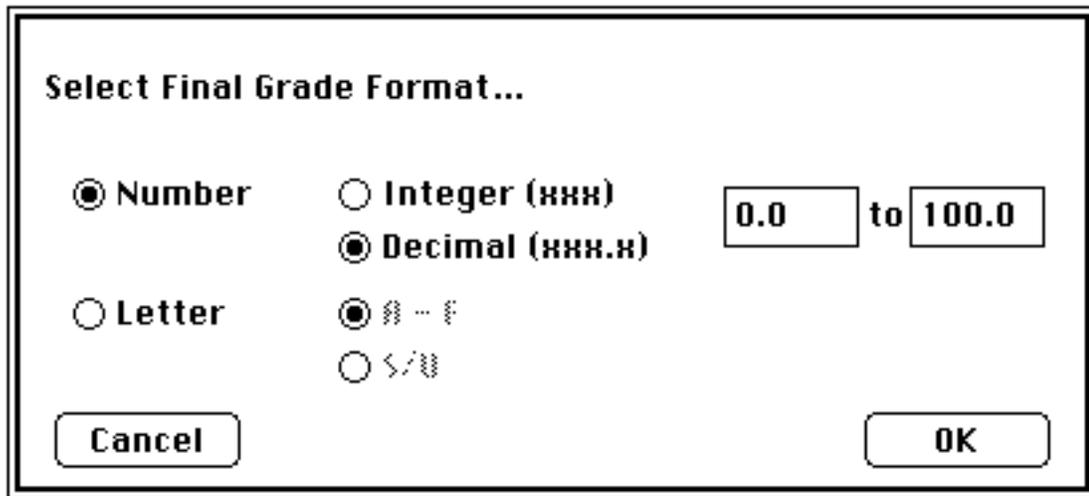
The average field must be numerical and is usually decimal. If you have used letter grades during the term, you will probably set the range as 0.0 to 4.3, where 4.3 corresponds to an A+. If you have used numerical scores, you will probably set the range as 0.0 to 100.0.

### 3. *Grade Format...* (Fig 2.42)

The final course Grade also has a reserved field which you must format. Suppose you intend to report a letter grade. Then,

- Click **Letter** and indicate whether only A-F or only S/U.

If “L” appears in the **GrOpt** field in the student information section of the screen and you have selected Letter grades, MacRegistrar uses the S/U option for that record, over-riding the general designation.

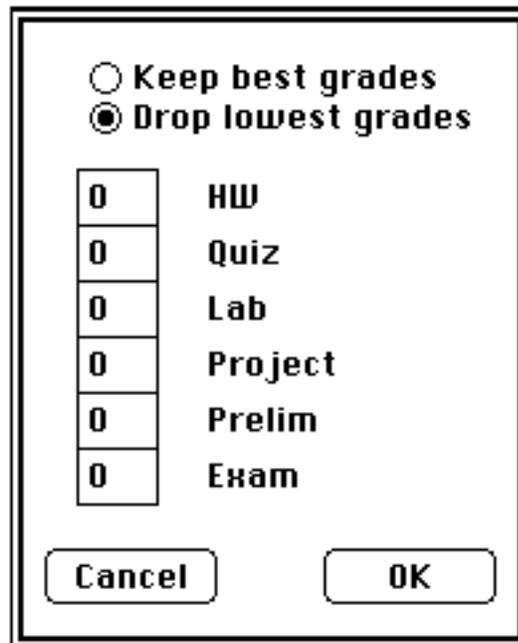


The dialog box is titled "Select Final Grade Format...". It contains several radio button options: "Number" (selected), "Integer (xxx)", "Decimal (xxx.x)", "Letter", "# - F", and "S/U". To the right of the "Integer" and "Decimal" options are two input boxes containing "0.0" and "100.0" respectively, with the word "to" between them. At the bottom left is a "Cancel" button and at the bottom right is an "OK" button.

Fig 2.46 Assign final course grade format

#### 4. Drop Lowest...(Fig 2.42)

- Pull-down the **Scores** menu with the mouse and drag to **Drop Lowest...** before you release the mouse button.



The dialog box is titled "Drop Lowest...". It has two radio button options: "Keep best grades" and "Drop lowest grades" (selected). Below these are six rows, each with a text input box containing "0" and a label: "HW", "Quiz", "Lab", "Project", "Prelim", and "Exam". At the bottom are "Cancel" and "OK" buttons.

Fig 2.47 Selection of grades to be included

This option allows you to exclude certain scores from the weighted average calculation. Dropping the lowest score in a given category is probably the most common such adjustment. You can apply this condition to any of the categories. Perhaps more useful in the generalized environment of MacRegistrar is the *Keep best grades* option. Let's accept the default of dropping no scores.

- Click **OK** to accept your choices.

Let's turn our attention to finding a composite score for the course.



Fig 2.48 Assign weights, calculate course average, etc.

5. **Weights...**(Fig 2.48)

- Pull-down the **Special** menu with the mouse and drag to **Weights...** before you release the mouse button.

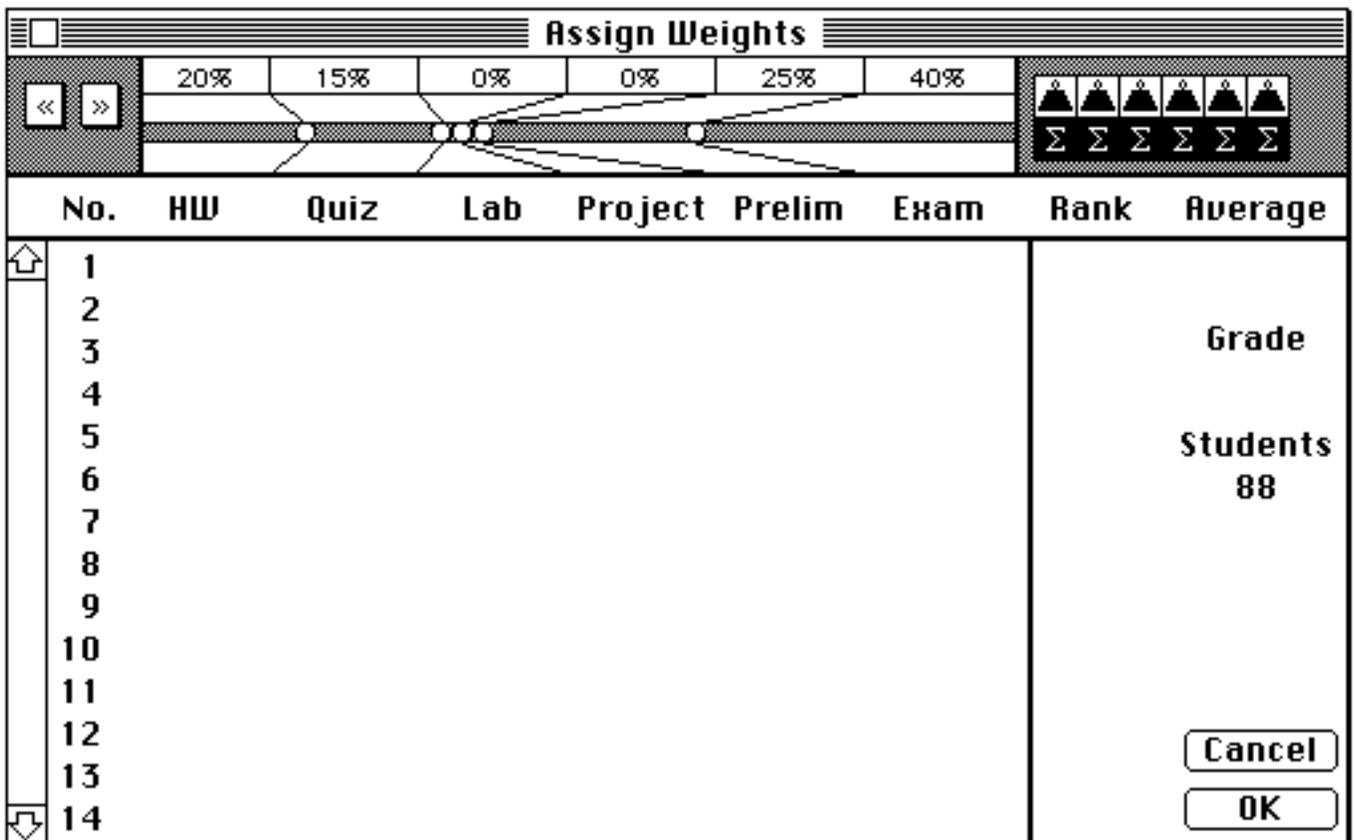


Fig 2.49 Weights window

We have implemented two different weighting schemes. The traditional scheme assigns percentages of the average score derived from each category, i.e., column. Let's review the first and defer the second to the Reference chapter. The details of the algorithm are also presented in the Reference chapter.

If not already selected:

- Click on the six capital sigmas at the top right of the screen to enable this option.
- Assign weights to each column by dragging the white circular dots at the top of the screen.

The percentage allocation always appears at the top of the screen and readjusts as you drag the control points. They always total 100%. The arrow heads at the top left permit you to initialize the control points at either end before you begin making assignments.

- Click the right most of the two arrow heads.

Now assign the weights:

HW 10% ; Quiz 20%; Lab 0% ; Project 0%; Prelim 40%; Final 30%

No.	HW	Quiz	Lab	Paper	Project	Exam	Rank	Average
1								
2								
3							Grade	
4								
5							Students	
6							88	
7								
8								
9								
10								
11								
12								
13								
14								

Fig 2.50 Assign weights for each column

- Click OK

6. **Calculate Average...**(Fig 2.48)

- Pull-down the **Special** menu with the mouse and drag to **Calc. Average...** before you release the mouse button.

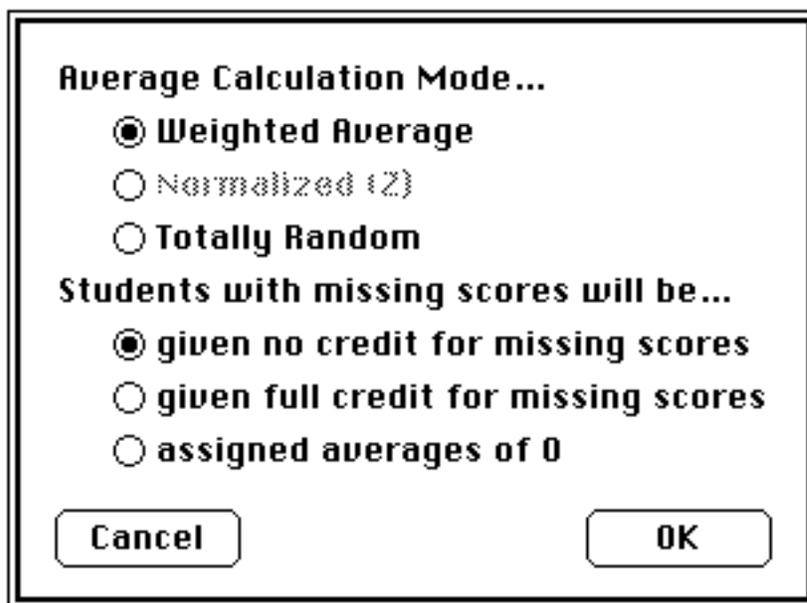


Fig 2.51 Select averaging technique

Again, at this step several options are available. Let's use the defaults, **Weighted Average** and **no credit for missing scores**.

If you use the last option MacRegistrar assigns a *zero* course average for any student records that do not have scores for all of the expected fields or, for whatever reason, cannot be computed. The program ignores a column having zero weight. See the **Reference** chapter for a discussion of the other options.

- Click **OK** to initialize the calculation.

#### 7. **Calc. Grade...**(Fig 2.48)

- Pull-down the **Special** menu (Fig 2.48) with the mouse and drag to **Calc. Grade...** before you release the mouse button.



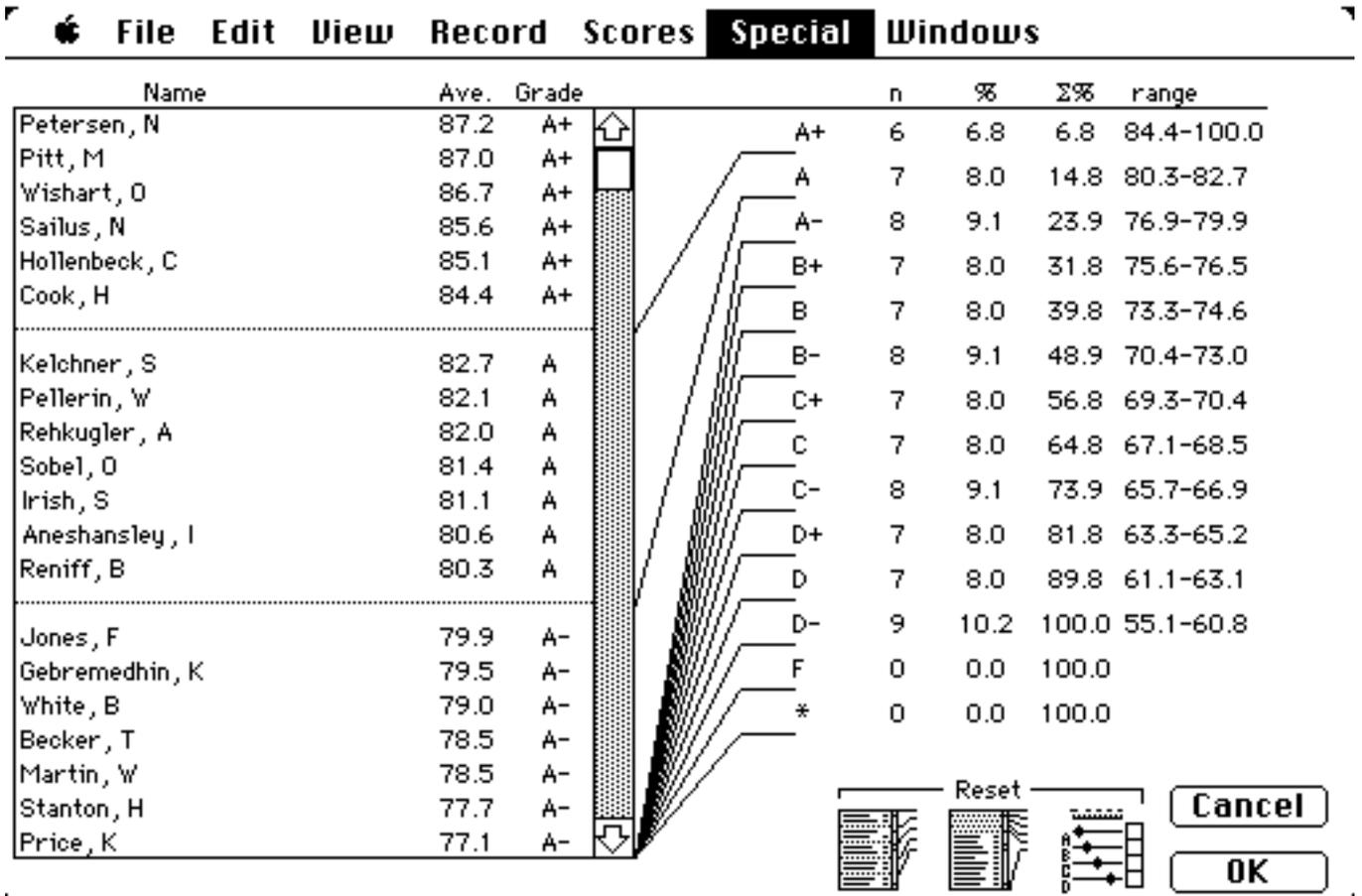


Fig 2.54 Uniform initial distribution

To assign grade ranges:

- Drag the A+ division line (the topmost line) to the lower end of the A+ range, e.g., after Wishart.

File Edit View Record Scores **Special** Windows

Name	Ave.	Grade	n	%	Σ%	range
Petersen, N	87.2	A+	6	6.8	6.8	84.4-100.0
Pitt, M	87.0	A+	7	8.0	14.8	80.3-82.7
Wishart, O	86.7	A+	8	9.1	23.9	76.9-79.9
Sailus, N	85.6	A+	7	8.0	31.8	75.6-76.5
Hollenbeck, C	85.1	A+	7	8.0	39.8	73.3-74.6
Cook, H	84.4	A+	8	9.1	48.9	70.4-73.0
Kelchner, S	82.7	A	7	8.0	56.8	69.3-70.4
Pellerin, W	82.1	A	7	8.0	64.8	67.1-68.5
Rehugler, A	82.0	A	8	9.1	73.9	65.7-66.9
Sobel, O	81.4	A	7	8.0	81.8	63.3-65.2
Irish, S	81.1	A	7	8.0	89.8	61.1-63.1
Aneshansley, I	80.6	A	9	10.2	100.0	55.1-60.8
Reniff, B	80.3	A	0	0.0	100.0	
Jones, F	79.9	A-	0	0.0	100.0	
Gebremedhin, K	79.5	A-				
White, B	79.0	A-				
Becker, T	78.5	A-				
Martin, W	78.5	A-				
Stanton, H	77.7	A-				
Price, K	77.1	A-				

Fig 2.55 Adjust lower limit for A+

The next score below the cutoff for the A range (79.9) is quite close. A review of the details of the Jones record might influence the choice of the cutoff.

- Double-click on *Jones, F* to retrieve that record.

Irish, S	81.1	A
Aneshansley, I	80.6	A
Reniff, B	80.3	A
Jones, F	79.9	A-
Gebremedhin, K	79.5	A-

Fig 2.56 Double-click to review the details of a record

Intro to Agr Engr								
Name: Jones, F			CUID: 297512		SSN:	TA: CM		
IntID: 11958		Cl: 1	Col: 2	Lec:	Lab:	Sec: 2	Credit: 2	GrOpt:
No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average
1	52	61	██████	██████	81	92	3	79.9
2	96	9.1						
3	94	23.0						
4	57	25						
5	59							
6	54							
7								
8								
9								
10								
11								
12								
13								
14								

**OK**

Fig 2.57 Student record review

Click **OK** when you wish to return to the grade assignment window.

Due to some extenuating circumstances, e.g., a two-week medical leave which resulted in an abnormally low grade, you may wish to move the *Jones* grade higher.

- Drag *Jones* to the space between *Irish* and *Aneshansley*.

Rehkugler, A	82.0	A
Irish, S	81.1	A
Aneshansley, i	80.8	A
Reniff, B	80.3	A
<b>Jones, F</b>	<b>79.9</b>	<b>A</b>
Gebremedhin, K	79.5	A-

Fig 2.58 The ordered list can be altered by dragging

The program now readjusts the list order *and* grade assignment as follows:

Sobel, O	81.4	A
Irish, S	81.1	A
Jones, F	79.9	A
Aneshansley, I	80.6	A
Reniff, B	80.3	A
<hr/>		
Gebremedhin, K	79.5	A-
White, B	79.0	A-

Fig 2.59 The revised partial list

Manipulate the list until you are satisfied.

### ***Output to Printer and to Files.***

So far in this demo all output has been routed to the screen. We have implemented two other possibilities — output to a printer and output to a file. You will find a printer invaluable for producing archival records, for preserving a backup, for analysis of trends, for producing communications to the students, as well as for the important verification of your input.

### ***Prepare the printer.***

Verify that your printer is properly prepared before you advance to the following section. If you are using a LaserWriter, use the **Control Panel** of the **Apple** menu to verify that AppleTalk is connected. Then use **Chooser**, also on the **Apple** menu, to properly route the output to the LaserWriter or ImageWriter printer.

#### *1. Print Individual Student Records.*

- Activate the **Student** window (**Windows** menu) if not already active.
- Pull-down the **File** menu (Fig 2.3) with the mouse and drag to **Print Student Records...** before you release the mouse button.

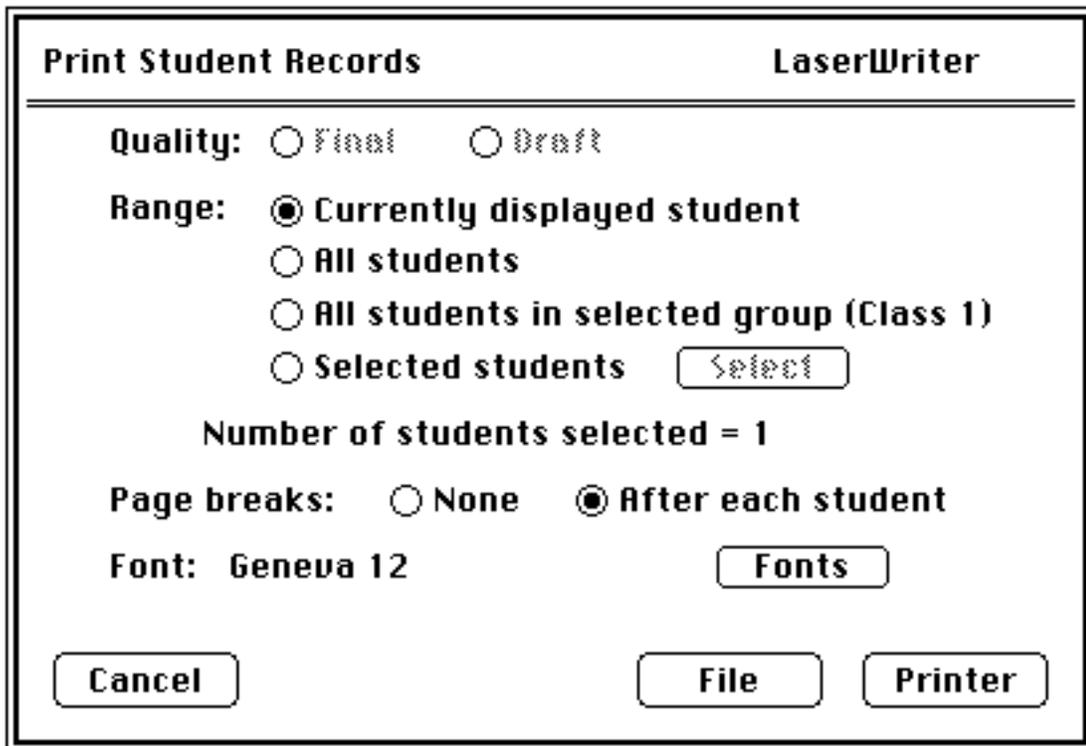


Figure 2.60 Output menu

- Select Final or Draft quality if you are using an ImageWriter.
- Specify the range of records you want to print:
  - The currently displayed record
  - All students
  - All students in a selected group
  - Selected students.

If one of the subdivisions (TA, Class, College, Lecture, Lab, or Section) in the **View** menu has a dot preceding it, then MacRegistrar enables the **All students in a selected group** option, and the subdivision selected by the Arrow scroll becomes available for printing.

If you choose the **Selected students** option, you can select any combination of records you want to print. As with the **Select** option of the Record menu, you can either:

identify a single record by typing part of the name and pressing *return* or by scrolling the desired name into view and clicking on it

select a contiguous group of names using the technique above to select the first name in the list, scroll until the last name in the desired group is visible, and then shift-click on it to designate the entire range

select a discontinuous group using the technique above to choose the first name, scroll until the next desired name is visible, and then command-click to add it to the developing list

- Click **OK** when your selections are complete.

Except for specifying the placement of page breaks and the font and font size, MacRegistrar automatically formats the records for you.

- Click on **Fonts** to select the font and font size for the output.

Note: The font sizes in the system file appear in the middle column. MacRegistrar generates other sizes when you enter them in the third column box.

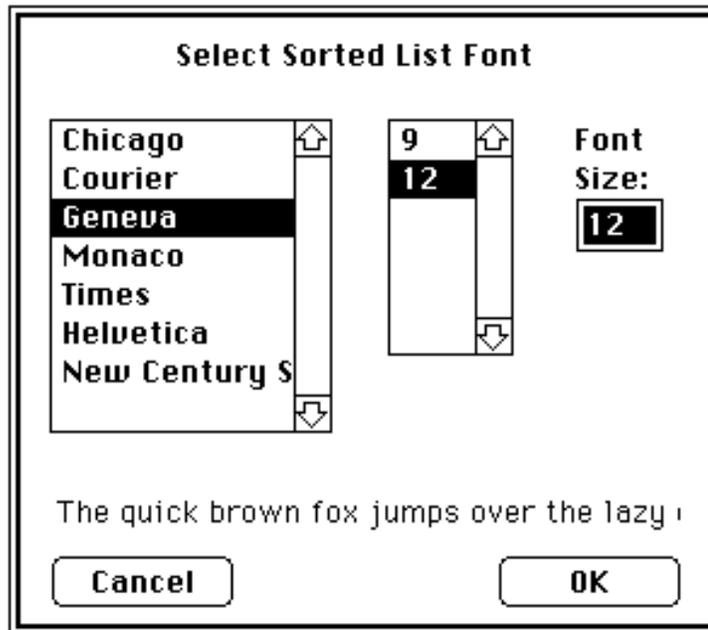


Fig 2.61 Font and font size selection

- Click **OK** to return to the print window.

Finally, you can now send the record(s) to the printer or to a PICT file.

Either:

- Click **Printer** or Click **File**.

MacRegistrar automatically names the file which you can edit and print using MacDraw.

Note: Because MacDraw allows a limited number of fonts in a PICT file, we have also attached a PICT resource to the file which you can retrieve with a resource editor (ID=128).

## 2. Print Sorted Lists.

If you have selected a sorted list in the **Windows** menu and prepared it as described earlier (Fig 2.32), you can send that sorted output to the printer or to a file. Create a sorted list now, if one is not already available, and then:

- Pull-down the **File** menu with the mouse and drag to **Print Sorted List...** before you release the mouse button.



Fig 2.62 Modified File menu

Note that the name of this menu item has changed to reflect its current usage.

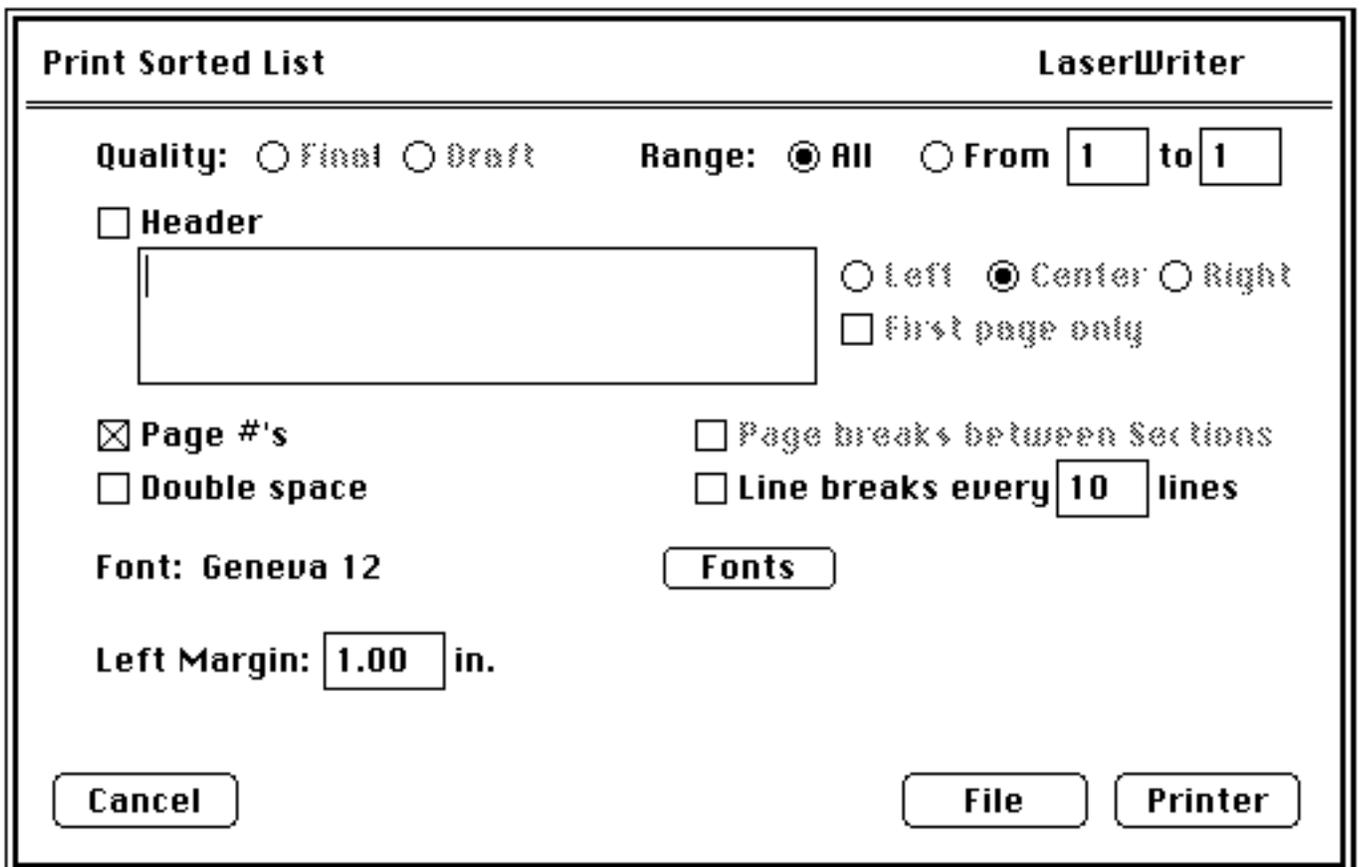


Fig 2.63 Print/file sorted lists

***Describe the output you wish to print now.***

As before, you can specify the print quality if you are using an ImageWriter. You can also specify the range and add automatic page numbers.

- Click on the **Page Numbers** box.

You can add a header to each page.

- Click on the **Header box** and supply a header.

The header can be **left**, **center**, or **right** justified and can be printed on just the first page or on the top of every page.

- Select **page breaks** after every 10 lines.

If you had sorted by section, you could add page breaks between sections.

You can change the font or font size.

- Click on **Fonts** and make your choices.
- Click **OK** to return to the Print menu.

Finally, if you wish to maintain a **left binding margin**, e.g., for a 3 ring binder, assign a left margin. If you need multiple pages per line, a message appears on the screen.

You can either:

- Click **Printer** or Click **File**.

**Note:** If the required output width exceeds a standard page (e.g., choice of many fields or a larger font size), the program automatically produces a multiple page width to preserve the requested information. It labels the leftmost page A and the next group of columns page B, etc. The top of the screen indicates the layout. If you need multiple pages per line, you can elect to have **Name**, **CUID**, or both repeated on each page.

**Note:** This option also allows you to produce an archival copy of your records which you can use in future years, even if you use a different computer.

### ***Export/Import*** (Fig 2.62)

Many users may not need the Export/Import capability; therefore, this section may be optional reading.

#### 1. *To the Registrar.*

The most common operation is the export of the term results to the Registrar via diskette (or telecommunication). We assume that you have already computed the term Grade field, have made any necessary manual adjustments to the automatic conversion, and have printed a copy.

- Pull-down the **File** menu (Fig 2.62) with the mouse and drag to **Export...** before you release the mouse button.

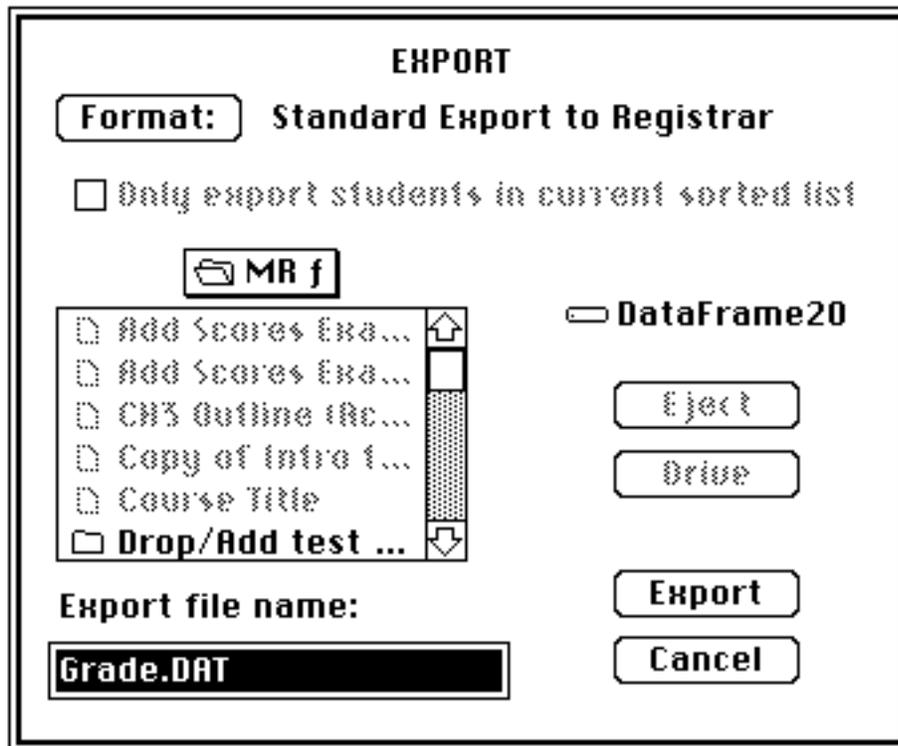


Fig 2.64 Export choices

The Export menu allows you to choose or create an export format and to name the Export file. We will examine and then use both defaults.

We could just accept both defaults by clicking on **Export**; however, examine the procedures briefly.

- Click on the **Format** button.



Fig 2.65 Select, edit, or create export format

At this point let's examine the **Standard Export to Registrar** file.

- Click on **Edit**.

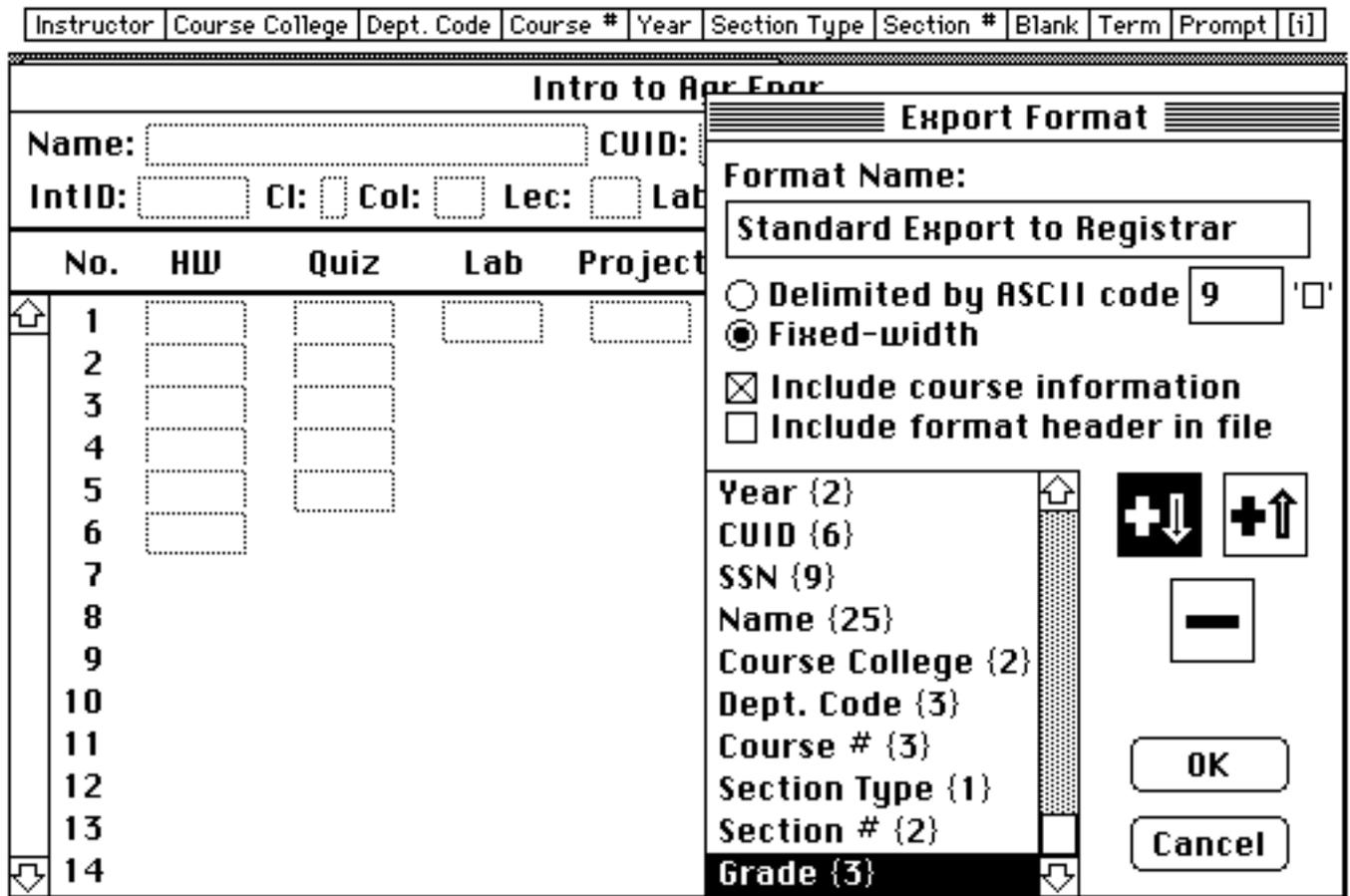


Fig 2.66 Edit export format

Let's examine, but not change, the contents of this movable window. You can edit the title of the format name. MacRegistrar can produce fixed width and variable width fields. The database fields appear in the scrollable window and show the widths in braces. The **Include course information** box has been checked.

- Click **Cancel** to abort the edit process.

With the **Standard Export to Registrar** title highlighted:

- Click on **Select**.

You have now returned to the original export window (Fig 2.64). Let's accept the default name for the export file.

- Click on **Export**.

MacRegistrar has created a text file. You can use any word processor which reads a standard ASCII text file to review this file. Do not tamper with the spacing in the file. Follow reasonable security precautions to assure the integrity of this file.

**Export to Excel, DataDesk, Cricket Graph or to a Pascal or FORTRAN program and then Import the data after modification by one of these programs.**

Suppose we wish to export the six homework grades for study in another program.

- Pull-down the **File** menu with the mouse and drag to **Export...** before you release the mouse button.

The window of Fig 2.64 appears.

We must create an export format, therefore:

- Click on **Format**.

The Select Export Format window appears.

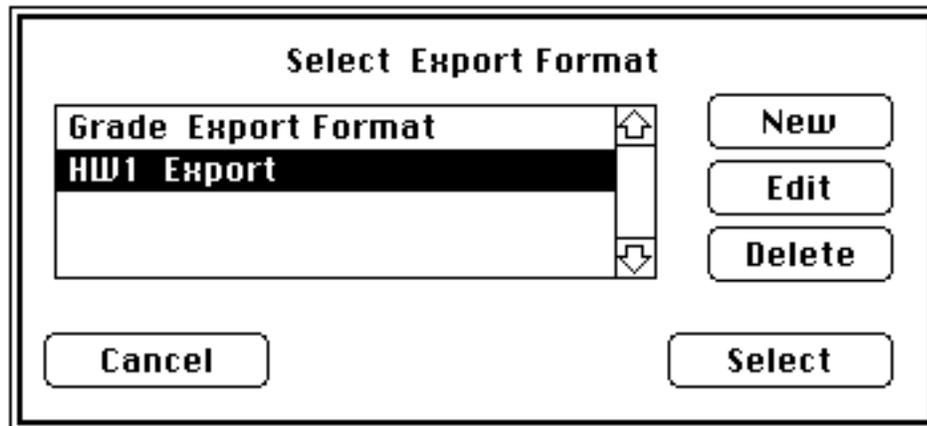


Fig 2.67 Select, edit or create the export format

- Click on **New**.

A default name appears. Edit this name if you wish. In this file we wish to have variable length fields separated by horizontal tabs (ASCII HT). The default delimiter is the desired character but examine the assignment procedure anyway.

- Click on the hollow rectangle to the right of the ASCII code box.

A table of the ASCII set appears.

NUL	DLE		0	@	P	`	p
SOH	DC1	!	1	A	Q	a	q
STX	DC2	"	2	B	R	b	r
ETX	DC3	#	3	C	S	c	s
EOT	DC4	\$	4	D	T	d	t
ENQ	NAK	%	5	E	U	e	u
ACK	SYN	&	6	F	V	f	v
BEL	ETB	'	7	G	W	g	w
BS	CAN	(	8	H	X	h	x
<b>HT</b>	EM	)	9	I	Y	i	y
LF	SUB	*	:	J	Z	j	z
VT	ESC	+	;	K	[	k	{
FF	FS	,	<	L	\	l	
CR	GS	-	=	M	]	m	}
SO	RS	.	>	N	^	n	~
SI	US	/	?	O	_	o	

Fig 2.68 Select field delimiter

- Click on a character to select it, **HT** in this case.

The ASCII window closed automatically.

The remaining two check boxes allow you to include format headers and course information (Instructor, Course Name, Section, etc.) at the beginning of the file. Let's omit these pieces of information.

Next you must select the fields you wish to include in the export file. If the Export Format window obscures some of the fields of interest, drag it to a different location.

Note: You **MUST** include either the student Name or CUID in the export file if you intend to subsequently import some of the file. Also, you must have put at least the Name field in an export format to activate the **OK** button.

- Click on each field in the desired ordering for the file.

Name  
 HW 1  
 HW 2  
 HW 3  
 HW 4  
 HW 5  
 HW 6

The list appears in the scroll menu.

Note: To remove any field from the list, select its name and click the minus icon. The icon with the up arrow allows you to add field names before a currently selected field. The icon with the down arrow allows you to add field names after a currently selected field.

- Click **OK**.

This creates a format with the default name. Next you must choose this format:

- Click on **Select** to accept this format.
- Assign a file name for the export file.
- Click **Export**.



Fig 2.69 Export status report

The student window becomes active again when you have completed the data export.

Note you may wish to use a word processor, e.g., MacWrite or Word 3.0 to examine the export text file. For WriteNow, use the Translate program first.

This export file can be read directly by Excel without any special preparation. We leave that as an exercise for you.

### ***Import.***

In preparation for the next exercise destroy the contents of the homework fields so that when MacRegistrar has completed the import, you can be satisfied that you have mastered the process.

- Assign 0 to HW 1 of the current student record.
- Pull-down the **File** menu with the mouse and drag to **Fill** before you release the mouse button.

This sets HW 1 to zero on every record in the course file.

With the field still selected:

- Pull-down the **Edit** menu with the mouse and drag to **Copy All** before you release the mouse button.

This makes a copy of this field on every record.

- Select in turn each of the remaining HW fields.
- Pull-down the **Edit** menu with the mouse and drag to **Paste All** before you release the mouse button.

MacRegistrar has now erased all homework information. You can begin the import process.

- Pull-down the **File** menu with the mouse and drag to **Import...** before you release the mouse button.

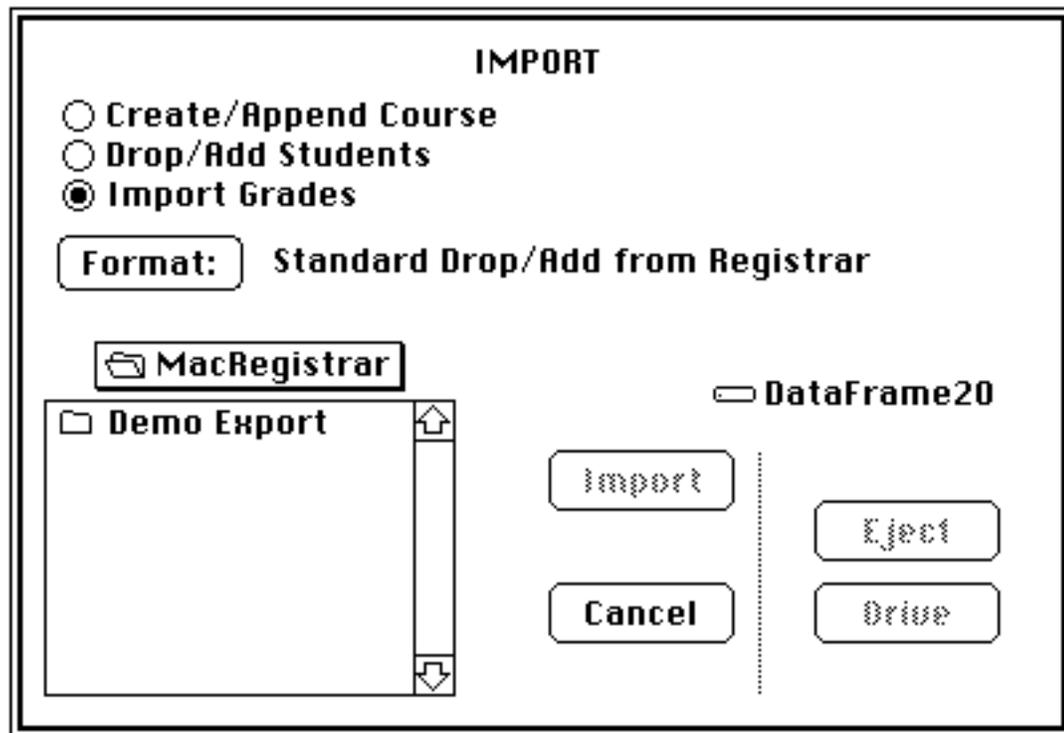


Fig 2.70 Import options

Data import has three basic categories:

- Create/Append Course
- Drop/Add Students
- Import Grades

Create/Append imports the student data included at the top of the student screen. No grade information is included. This is the form of the data file received from the Registrar before the term begins. Drop/Add Students updates data in your course files using the Registrar-supplied update file. Import Grades is applicable in the present exercise; we wish to restore the data exported in the previous exercise.

- Click on **Import Grades** to select the option.
- Click on **Format** to select an import format.

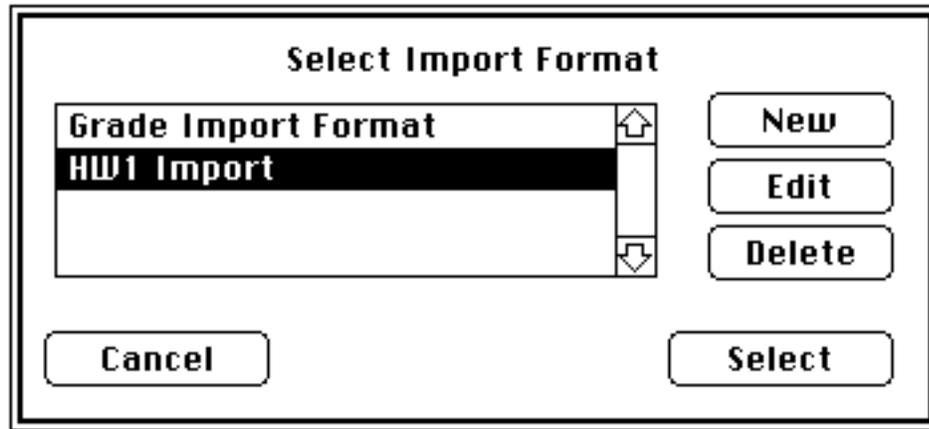


Fig 2.71 Select import format

- Click on **New** to customize a format.

MacRegistrar assigns a default name; modify it if you wish. Since the export field delimiter was the ASCII 9 character, choose that here. Also since MacRegistrar did not export the course information and format header, they should not be checked here.

- Select the same fields in the same order you selected them in the export exercise.
- Click **OK**.

When the Select Import Format window returns:

- Click on **Select**.

The final step is to select the data file used to store the exported data.

- Click on the name of the format you just created.
- Click on **Import**.

The import notice provides a progress report on the number of records imported so far.

### ***Miscellaneous Operations.***

The **Special** menu has three additional operations:

Change **Password...**  
Change **Course Info...**  
Generate **IDs.**

- Pull-down the **Special** menu with the mouse and drag to **Change Password...** before you release the mouse button.

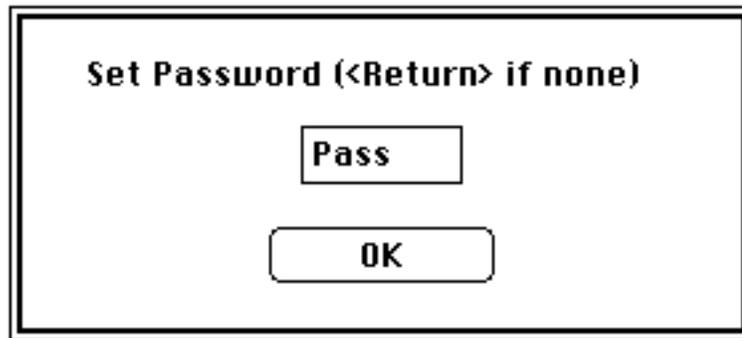


Fig 2.72 Assign a course file password

You can enter a secret password to thwart casual inspection of your course files, but you *MUST* remember the password if you wish to use the files again. The best protection, of course, is to secure physically your floppy or hard disk files. Your password should be an easily remembered code, but not one which will be obvious to an intruder.

- Pull-down the **Special** menu with the mouse and drag to **Change Course Info...** before you release the mouse button.

A dialog box titled "Course Information" with a double-line border. It contains several text input fields and two buttons. The fields are: "Instructor's Name" with "Cooke, J. Robert"; "Course Name" with "Intro to Agr Engr"; "Course College" with "CAL S"; "Course Department" with "Agr Engr"; "Course Number" with "100"; and "Notes" with "Fall 87". At the bottom left is a "Cancel" button and at the bottom right is an "OK" button.

Fig 2.73 Course information

Edit any of the fields you wish to change.

Note: If MacRegistrar imported the class list from the Registrar as a text file, the college, department, and course number codes will appear to the right of the corresponding text fields. The text fields may contain useful alphanumeric information, but MacRegistrar uses the corresponding numerical codes imported with the Registrar's file during export to the Registrar. Therefore, you cannot edit these codes within the program. If you entered the class list, MacRegistrar requests these identifying codes during the export process.

- Click **OK**.
- Pull down the **Edit** menu with the mouse and drag to **Generate IDs** before you release the mouse button.

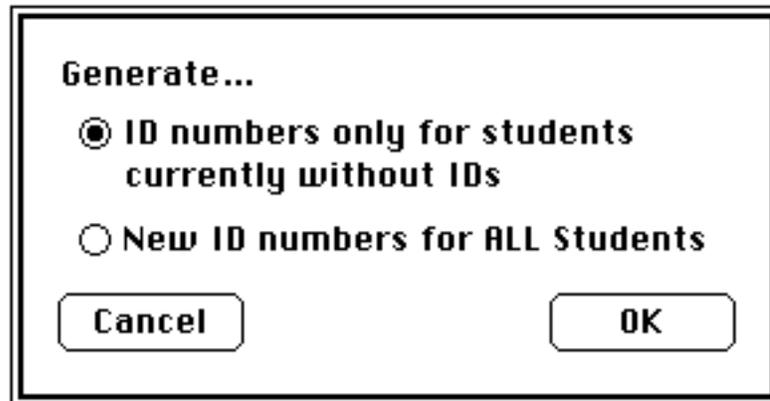


Fig 2.74 Generate internal identification numbers

Normally, you perform this operation just before you intend to post the first set of confidential scores. You can generate nonrepeated IDs later for new additions to the class without destroying the original set of numbers.

- Click **OK** to accept the default generation process and maintain any existing numbers in the **IntID** field.

### **Closure.**

This completes the guided tour of MacRegistrar features. Refer to the following chapters if you require a more detailed review of the features.

To complete this exercise:

- Pull-down the **File** menu with the mouse and drag to **Close Course** before you release the mouse button.
- Pull-down the **File** menu with the mouse and drag to **Quit** before you release the mouse button.

To terminate the session:

- Pull-down the **Special** menu of the Finder with the mouse and drag to **Shut Down** before you release the mouse button.

The disk ejects and the system powers down. Develop the habit of securely storing your program and data disks.

**Do that now.**

## Chapter 3    **Advanced Techniques**

In the preceding chapter you used an existing course file to examine the most frequently used features of MacRegistrar. This chapter includes several important but less frequently used techniques. You will learn to transfer a class list text file supplied by the University Registrar into MR to create a course file and to transfer the course file from MR into a text file and then into general tools such as Excel, Cricket Graph, and DataDesk. You will also learn to update your class list at the end of the drop/add period and to export final grades to the Registrar at the end of the term.

In the final section the versatile grading algorithm built into MR is detailed. For the ultimate level of flexibility and generality, we have included an outline of a Pascal program to compute a weighted average as a shell for you to customize.

### 3.1 Import Class List From Registrar

To create course files manually, use the **New** command of the **Record** menu, then keyboard entry. However, MR offers a significantly more convenient process for larger courses. In this section we assume that your class list is a machine readable text file. Now, let's transform such a text file into the specialized, compressed format used by MacRegistrar.

Suppose your class list is in a fixed field width format as follows:

```
Cooke, J. Robert
02
02
100
Albright, G      307446 058784598 1 02 01 01 01 0200 L
Aneshansley, I   310066 907645354 1 03 02 02 02 0200 E
Bart, B          311957 564654565 2 04 03 04 04 0200 L
Bartsch, E       301814 864654521 3 02 01 06 06 0200 L
Bates, W         284216 986565624 1 01 02 03 03 0200 L
  (more)
```

Fig 3.1 Registrar import file displayed with variable width characters

Only a few records of the text file AGEN100.F87 supplied on the distribution disk appear above. When you load this file into your word processor, the fixed width fields appear to be improperly aligned. Select the entire document and change from the variable character width Geneva font to a monospaced font such as Monaco or Courier. Then the alignment of the fixed width columns becomes apparent.

```
Cooke, J. Robert
02
02
100
Albright, G      307446 058784598 1 02 01 01 01 0200 L
Aneshansley, I   310066 907645354 1 03 02 02 02 0200 E
Bart, B          311957 564654565 2 04 03 04 04 0200 L
Bartsch, E       301814 864654521 3 02 01 06 06 0200 L
Bates, W         284216 986565624 1 01 02 03 03 0200 L
  (more)
```

Fig 3.2 Registrar import file displayed with fixed width characters

The first four lines give the instructor name, a two digit college code, a two digit department code, and a three digit course number. Collectively these are referred to as the "Course Information" fields. When establishing the import file format below, you must select "Include Course Information" (Fig 3.9). The remainder of the file consists of student records. In this example the data for each student enrolled in the course is a record consisting of ten fixed-width fields, *each* separated by a *space*. Fig 3.3 gives the field sizes.

<u>Field</u>	<u>Length</u>	<u>Description</u>
Name	25	Last name, comma, first name
CUID	6	Student's identification number
SSN	9	Social Security Number
Class code	1	Student's class number
College code	2	Student's College number
Lecture code	2	Lecture code number
Lab code	2	Laboratory code number
Section code	2	Section code number
Credits	4	Number of credits*
Grade option code	1	Letter or S/U**

\* In this example 0200 designates 02.00 credits with the decimal omitted.  
 \*\* L= letter grade, E= S/U exclusively, O=optional (becomes L or E)

Fig 3.3 Format of Registrar Import File (AGEN100.F87)

Note: Narrow settings of the left and right margin can produce line wrap.

**Import the example data file AGEN100.F87.**

With the MR disk in the drive,

- Double-click the MR icon.



Fig 3.4

You need not use *New Course...* to create a new course file because the required information will be obtained from the AGEN100.F87 file.

- Choose *Import...* from the **File** menu.



Fig 3.5 File menu

The Import window (Fig 3.6) appears. Since you wish to create a course file, you can use the default choice (Create/Append Course). This option adds new records to the end of a course file; in this instance no previous records are in the file.

Note: The second and third options are discussed in subsequent examples.

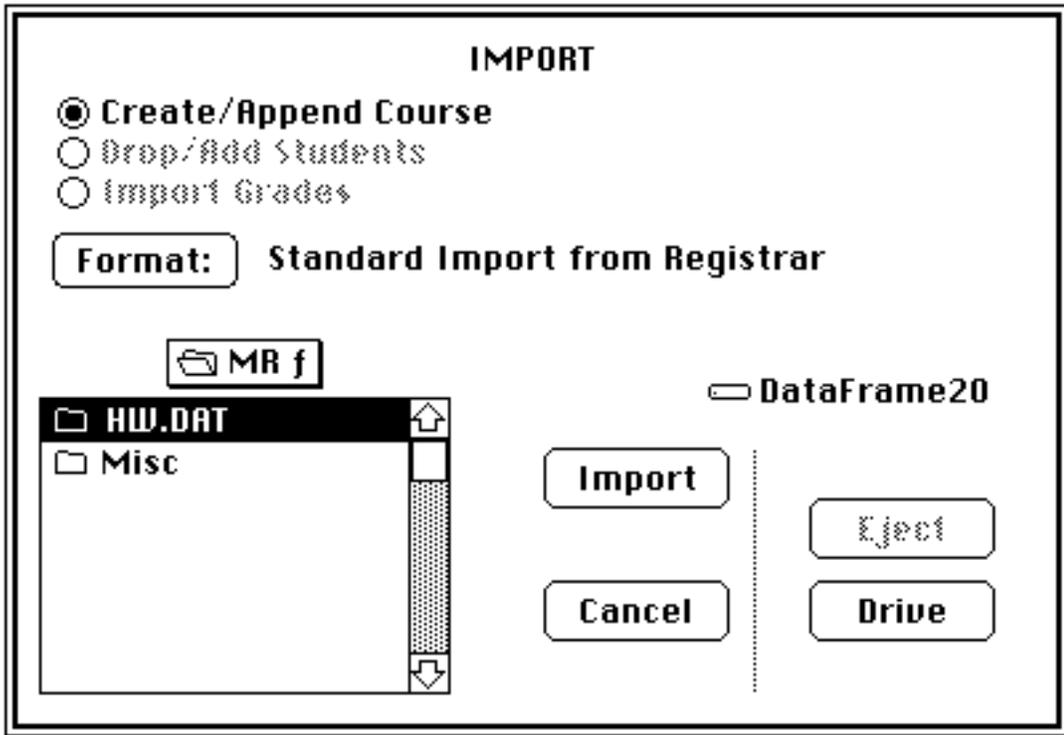


Fig 3.6 Import Window

The Format defaults to **Standard Import from Registrar** and corresponds to the format of the data file in Figure 3.2.

**Format:** Standard Import from Registrar

Fig 3.7 Format button

- Click on the **Format** button to review the format.

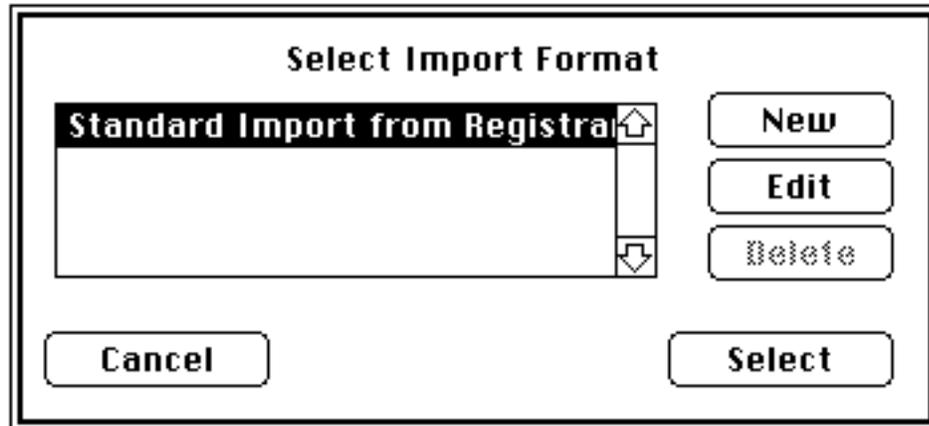


Fig 3.8 Select Import Format window

From this menu you can create a new format, edit an existing format, or delete a format. In this instance, just examine the existing format which already corresponds to the format of the file AGEN100.F87.

- Click on **Edit**.

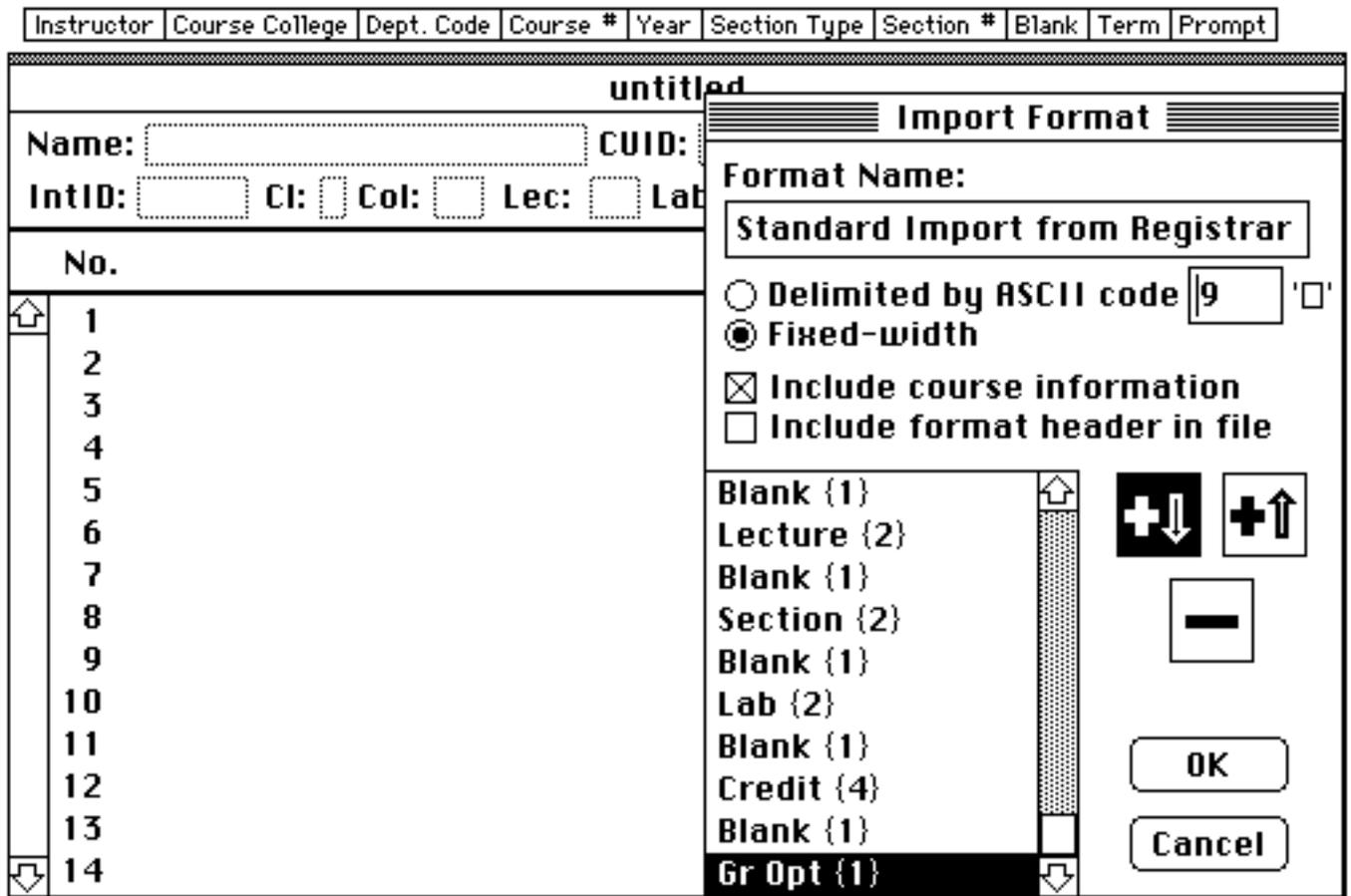


Fig 3.9 Import format window

The background screen shows the student record template. The movable Import Format window is superimposed on the template. The format name appears in the first field. Make no changes now, but note that the name could be edited.

Fixed width field input is the default. In other words, each field of input data must have the specified number of characters. [“Delimited by ASCII code” allows variable length fields and is described in the export example which follows.] The **Include Course Information** box has been selected; this sets the format to include the first four lines of the AGEN100.F87 file. The **Include Format Header** is not required here and is discussed later in this chapter.

- Scroll the window to review the file format.

Make no changes to the format now, just note that you can add fields before or after a selected entry, and you can delete them. To add a field to the list, simply click in that field of the student record template; if a desired field is not visible, move the Import Format window by dragging the title bar.

- Click **OK** when you are ready to return to the Select Import Format window.

Note: Any formats you define are saved as part of the MacRegistrar application for later use. Consequently, the MR application must *not* be locked.

The Select Import Format window (Fig 3.8) returns to view and you must now choose a format. The just-examined format is the default; therefore, you need only:

- Click **Select**.

MR now returns you to the Import window (Fig 3.6). The final step to initiate data importing is the selection of the data file. Use the customary techniques to select the drive, folder, and specific data file. In this example select the sample file AGEN100.F87.

- Click **Import**.

The importing process can be lengthy as a result of the data checking process we included. The **Importing...** window indicates progress.

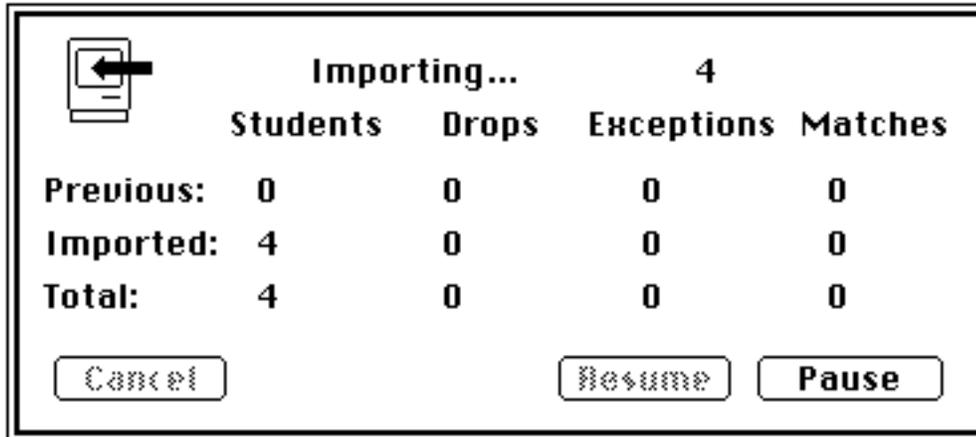


Fig 3.10 Importing status window

If necessary, you can interrupt the data transfer process and then either resume or abort the process.

If the data file does not conform *exactly* to the import format, the process aborts automatically. Use the Show Markers, Show Space, or similar options in your word processor to check conformity of the file. Extra characters cause a format mismatch. We recommend that you use your word processor to verify that MR read all records.

Note: To use WriteNow you must first translate the data file into text format using the Translator and then open the file by WriteNow. To return to text format, use the Translator again. Word 3.0 reads text files directly; for output you must use Save As... and select the Text file output option. Word 3.0 has convenient pre-set tabs. MacWrite also reads a text file; select the first option (carriage return for end of paragraph). Save your modified file in text format.

When the import process terminates normally, MR automatically opens the course file just loaded; and the file is ready for use. You must supply the TA (teaching assistant, paper grader, etc.) name. As you scroll through the file making this addition, the cursor automatically retains correct placement in the TA field. MR automatically fills the **IntId** field using the **Generate ID's...** command in the **Special** menu. The internal identification numbers are course specific and can be used to post test scores without violating the student's right to confidentiality. If you subsequently add additional students to the class list, you can preserve any previously generated and used IntId numbers.

## 3.2 Export of Data

MR is open ended, allowing you to transfer data back and forth between MR and other applications. For example, if our course grade calculation scheme does not encompass your favorite algorithm, simply export the data as a text file, perform the calculation using another application or even one you have written, save the results (including the student name or CUID) in a text file, and import the results. An outline of such a Pascal program is included in section 3.8.

In this section we outline the first of these steps—exporting data.

Let's use Intro to Agr Engr, the sample course file distributed with MR, and export the student name and the six homework scores.

- Use **Open Course...** in the **File** menu to access Intro To Agr Engr.

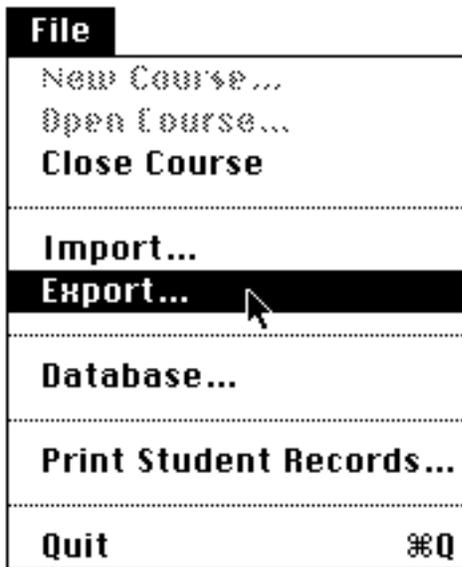


Fig 3.11 Export command

- Select **Export...** for the **File** Menu.

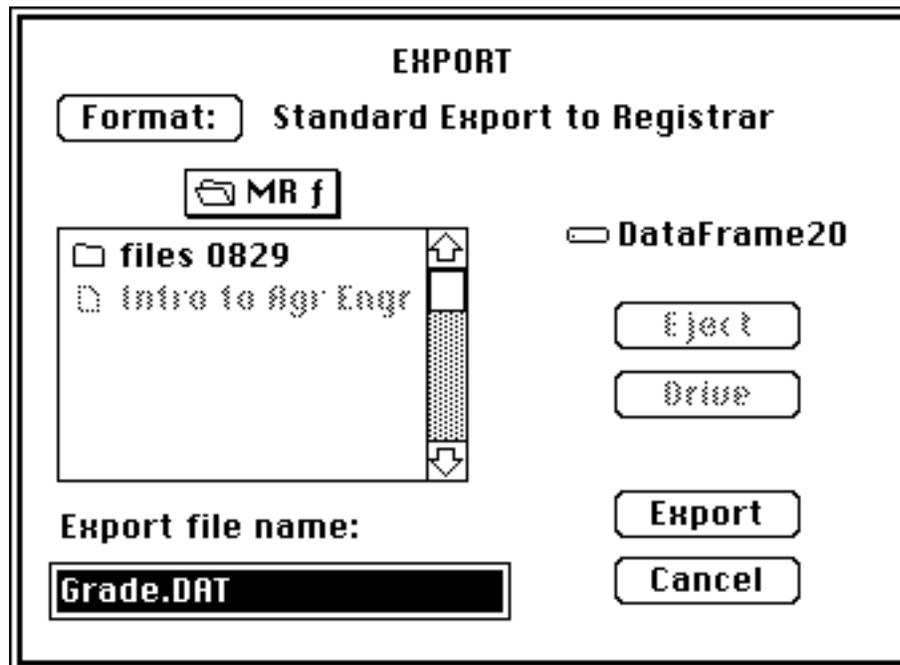


Fig 3.12 The Export window

The default options for the Export window have been set to export the term results to the Registrar. We will return to this window later; however, at the moment we want to export the homework scores.

- Click the **Format** button.

The Select Export Format window appears.



Fig 3.13 The Select Export Format Window

- Click **New** to define the export format.

Instructor	Course College	Dept. Code	Course #	Year	Section Type	Section #	Blank	Term	Prompt	[i]
<b>Intro To App Eng</b>										
Name: <input type="text"/>					CUID: <input type="text"/>					
IntID: <input type="text"/>		CI: <input type="checkbox"/>	Col: <input type="checkbox"/>	Lec: <input type="checkbox"/>	Lab: <input type="checkbox"/>					
No.	HW	Quiz	Lab	Paper						
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>						
2	<input type="text"/>	<input type="text"/>								
3	<input type="text"/>	<input type="text"/>								
4	<input type="text"/>	<input type="text"/>								
5	<input type="text"/>									
6	<input type="text"/>									
7										
8										
9										
10										
11										
12										
13										
14										

### Export Format

Format Name:

Delimited by ASCII code  ' '
   
 Fixed-width

Include course information
   
 Include format header in file

Fig 3.14 The Export Format Window

- Assign a name to the format you are creating, e.g., Export Format 1.
- Click **Delimited by ASCII code**.

This means that field will be separated by the ASCII character specified. If you forget the ASCII codes, click on the character enclosed in apostrophes.

Select Delimiter							
NUL	DLE		0	@	P	`	p
SOH	DC1	!	1	A	Q	a	q
STX	DC2	"	2	B	R	b	r
ETX	DC3	#	3	C	S	c	s
EOT	DC4	\$	4	D	T	d	t
ENQ	NAK	%	5	E	U	e	u
ACK	SYN	&	6	F	V	f	v
BEL	ETB	'	7	G	W	g	w
BS	CAN	(	8	H	X	h	x
<b>HT</b>	EM	)	9	I	Y	i	y
LF	SUB	*	:	J	Z	j	z
VT	ESC	+	;	K	[	k	{
FF	FS	,	<	L	\	l	
CR	GS	-	=	M	]	m	}
SO	RS	.	>	N	^	n	~
SI	US	/	?	O	_	o	

Fig 3.15 Select Delimiter Window

- Click on *HT* for the horizontal tab character, used by many applications such as Excel, Cricket Graph, and DataDesk.

MR then returns you to the previous window.

- Leave **Include course info** and **Include format header in file** unchecked (Fig 3.14).
- Select the desired fields by clicking (Fig 3.14).

Note: You must include student name or CUID if you wish to subsequently import the data or some derived values.

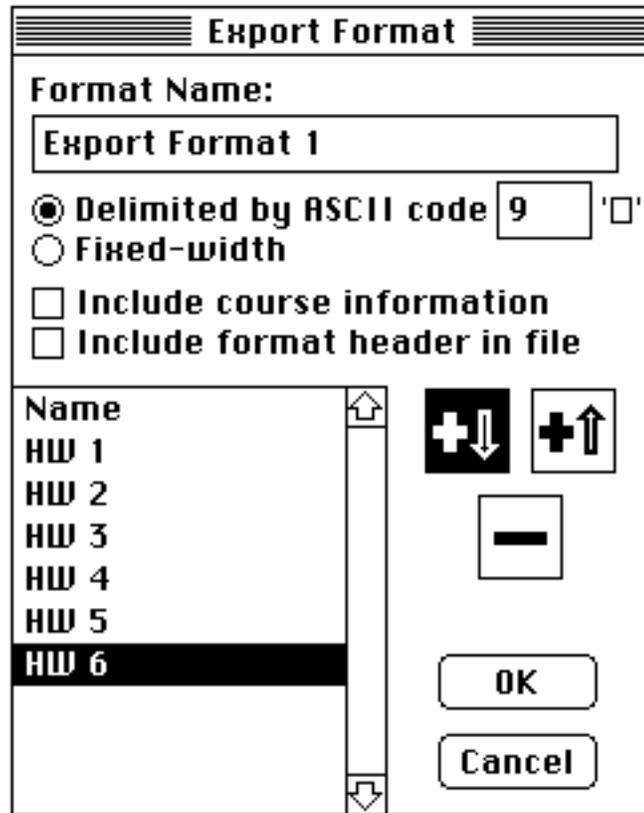


Fig 3.16 Format Window again

- Click **OK**.

The just created format is the default now.

- Click **Select** (Fig 3.17).

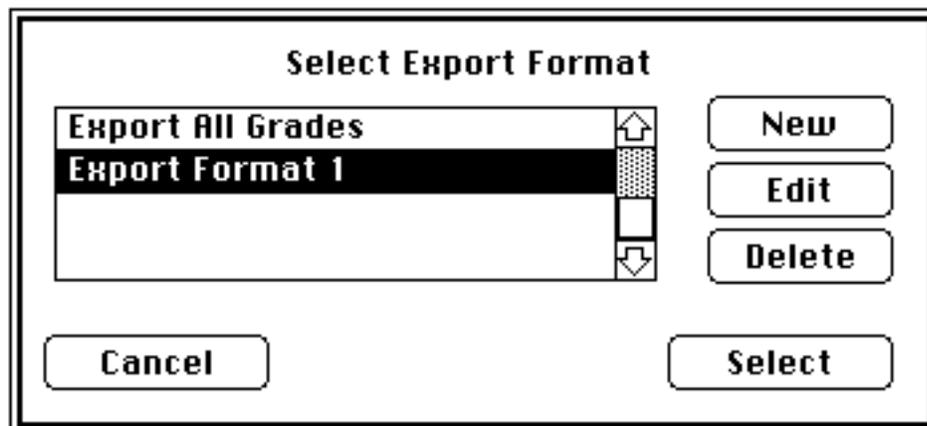


Fig 3.17 Select Export Format window again

Finally, name the text file that will receive the exported data.

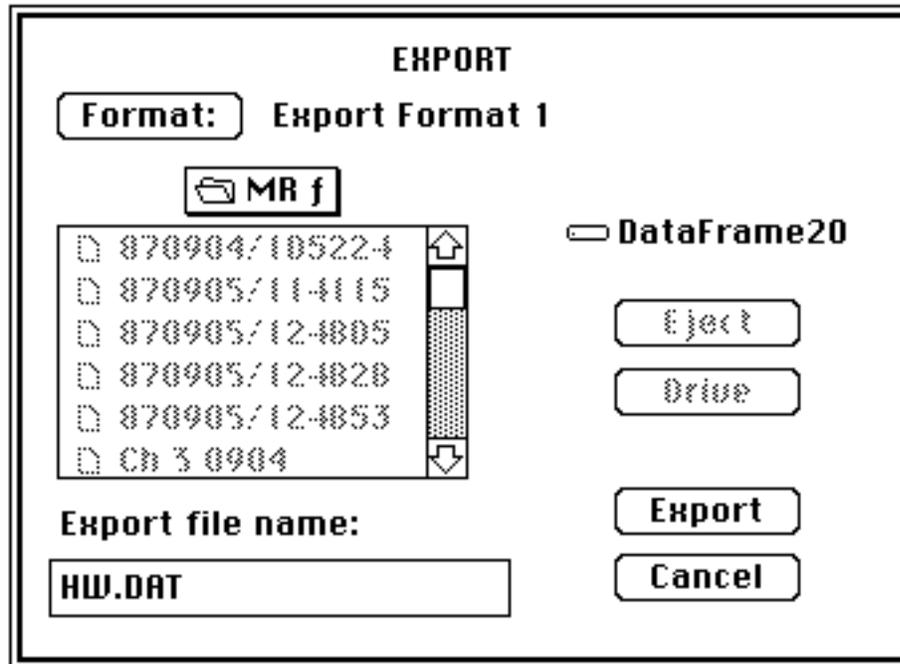


Fig 3.18 Export Window again

- Name the file HW.DAT and click **Export**.

MR now transfers the data into a text file HW.DAT.



Fig 3.19 Data export status window

You have just created a text file named HW.DAT which can be read by your word processor as well as by other applications. You may need to set tab stops to obtain one-student-record-per-line formatting. As established in the export format, a tab character separates each column (field) and a carriage return separates each row (record) .

Note: To use WriteNow, you must first use the Translator to convert from text to the WriteNow file structure.

```
Albright, G 67 67 65 65 54 87
Aneshansley, I 77 86 71 71 83 93
Bart, B 61 51 98 98 76 57
Bartsch, E 95 55 100 100 78 63
Bates, W 64 95 80 80 66 72
Becker, T 84 78 92 92 58 98
Boss, F 52 69 90 90 56 76
Brown, X 59 50 82 82 71 68
Burns, A 65 71 59 59 52 97
    (and more)
```

**Fig 3.20** Text file contents

We will use this file in subsequent exercises.

### **3.3 Import Data Into Excel**

If you have not created the text file HW.DAT in section 3.2, return to that section now to prepare the file for Excel.



**Fig 3.21** Excel icon

- Double click on the Excel icon to open a worksheet.

File Edit Formula Format Data Options Macro Window

A1 Albright, G

Worksheet1

HW.DAT

	A	B	C	D	E	F
1	Albright, G	67	67	65	65	5
2	Aneshansley, I	77	86	71	71	8
3	Bart, B	61	51	98	98	7
4	Bartsch, E	95	55	100	100	7
5	Bates, W	64	95	80	80	6
6	Becker, T	84	78	92	92	5
7	Boss, F	52	69	90	90	5
8	Brown, X	59	50	82	82	7
9	Burns, A	65	71	59	59	5
10	Campbell, I	68	55	64	64	7
11	Caveney, S	57	89	97	97	8
12	Cook, H	95	79	94	94	5
13	Cook, S	68	52	62	62	9
14	Cummings, W	58	75	93	93	9
15	Czarniecki, E	65	86	59	59	8
16	Czarniecki, S	94	75	80	80	8
17	Datta, F	79	86	96	96	8
18	Ditmars, H	68	50	95	95	7

Fig 3.22 Excel Worksheet

- Open the data file HW.DAT.



Fig 3.23 Open the text file

- Select the folder containing the file.

- Select the text data file HW.DAT.

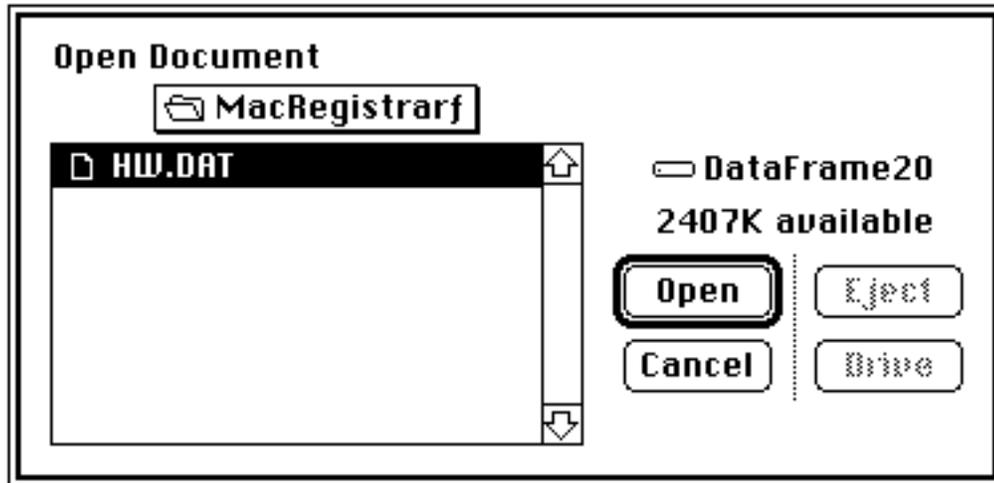


Fig 3.24 Select the text file

MR stores the data in rows and columns. You can resize the columns as desired. With narrower columns you can see all six data columns.

File Edit Formula Format Data Options Macro Window

A1      Albright, G

Worksheet1						
HW.DAT						
	A	B	C	D	E	F
1	Albright, G	67	67	65	65	5
2	Aneshansley, I	77	86	71	71	8
3	Bart, B	61	51	98	98	7
4	Bartsch, E	95	55	100	100	7
5	Bates, W	64	95	80	80	6
6	Becker, T	84	78	92	92	5
7	Boss, F	52	69	90	90	5
8	Brown, X	59	50	82	82	7
9	Burns, A	65	71	59	59	5
10	Campbell, I	68	55	64	64	7
11	Caveney, S	57	89	97	97	8
12	Cook, H	95	79	94	94	5
13	Cook, S	68	52	62	62	9
14	Cummings, W	58	75	93	93	9
15	Czarniecki, E	65	86	59	59	8
16	Czarniecki, S	94	75	80	80	8
17	Datta, F	79	86	96	96	8
18	Ditmars, H	68	50	95	95	7

Fig 3.25 Worksheet with HW data.

A spreadsheet program is especially useful in carrying out specialized computations for weighted average. Let's use column H to sum the homework scores for each student.

File Edit Formula Format Data Options Macro Window								
H2	=SUM(B2:G2)							
HW.DAT Excel sum								
	A	B	C	D	E	F	G	H
1	Albright, G	67	67	65	65	54	87	405
2	Aneshansley, I	77	86	71	71	83	93	481
3	Bart, B	61	51	98	98	76	57	441
4	Bartsch, E	95	55	100	100	78	63	491
5	Bates, W	64	95	80	80	66	72	457
6	Becker, T	84	78	92	92	58	98	502
7	Boss, F	52	69	90	90	56	76	433
8	Brown, X	59	50	82	82	71	68	412
9	Burns, A	65	71	59	59	52	97	403
10	Campbell, I	68	55	64	64	74	93	418
11	Caveney, S	57	89	97	97	80	56	476
12	Cook, H	95	79	94	94	53	75	490
13	Cook, S	68	52	62	62	99	73	416
14	Cummings, W	58	75	93	93	90	85	494
15	Czarniecki, E	65	86	59	59	87	93	449
16	Czarniecki, S	94	75	80	80	87	81	497
17	Datta, F	79	86	96	96	80	87	524
18	Ditmars, H	68	50	95	95	71	65	444
19	Donohoe, B	76	61	59	59	85	73	413

Fig 3.26 Worksheet with sum of homework scores in column H

### 3.4 Import Data Into Data Desk

You can use Data Desk to examine the data in considerable detail; however, we will demonstrate the import process and create a simple plot. Like the authors of Excel, we will omit many useful features here in the interest of simplicity.



Fig 3.27 The Data Desk icon

Let's use the HW.DAT text file created in section 3.2. Each row of data is separated by a carriage return, and each column is separated by a tab character. This structure is immediately apparent if you read the text file with Word 3.0.

- Use **Read Text file...** of the **File** menu to access the data file HW.DAT.

Note: The course file AGEN100.F87 from the Registrar does not have the expected format (e.g., tab delimited) and cannot be read correctly.

According to the Macintosh convention, select the objects before giving the command:

- Select the data you want to plot.

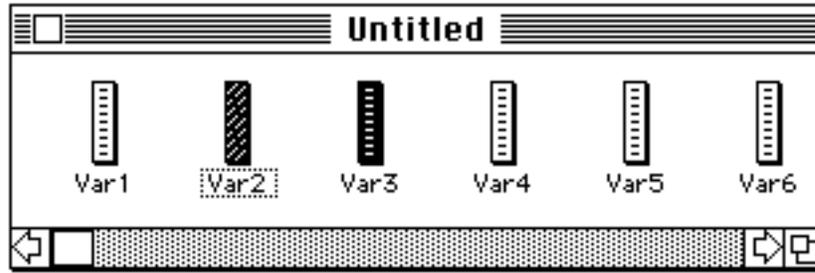


Fig 3.28 Choose variables to be plotted

- Choose the **Scatter Plot** command of the **Display** menu.

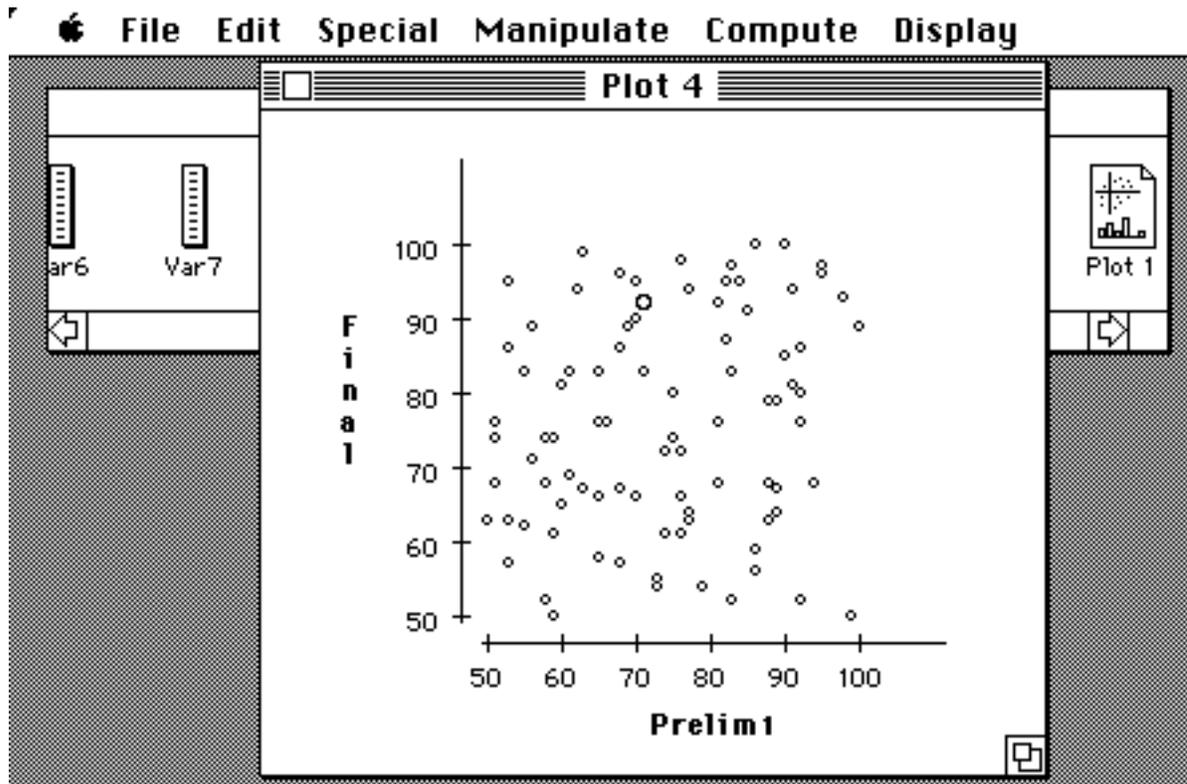


Fig 3.29 A Data Desk Plot (of different variables)

With a statistics program such as this you can identify students whose performance has changed during the semester.

### 3.5 Import Data to Cricket Graph



Fig 3.30 Cricket Graph icon

- Double click on the Cricket Graph icon.

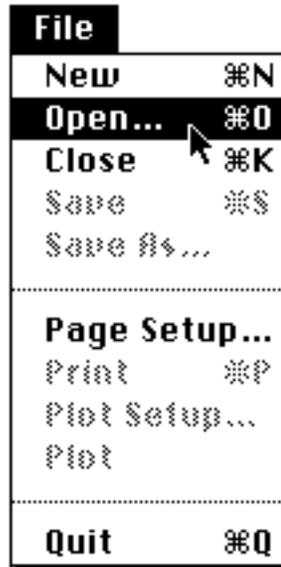


Fig 3.31 File menu

- Open the data file.

Note: The “Show all TEXT files” box must be checked (Fig 3.32).

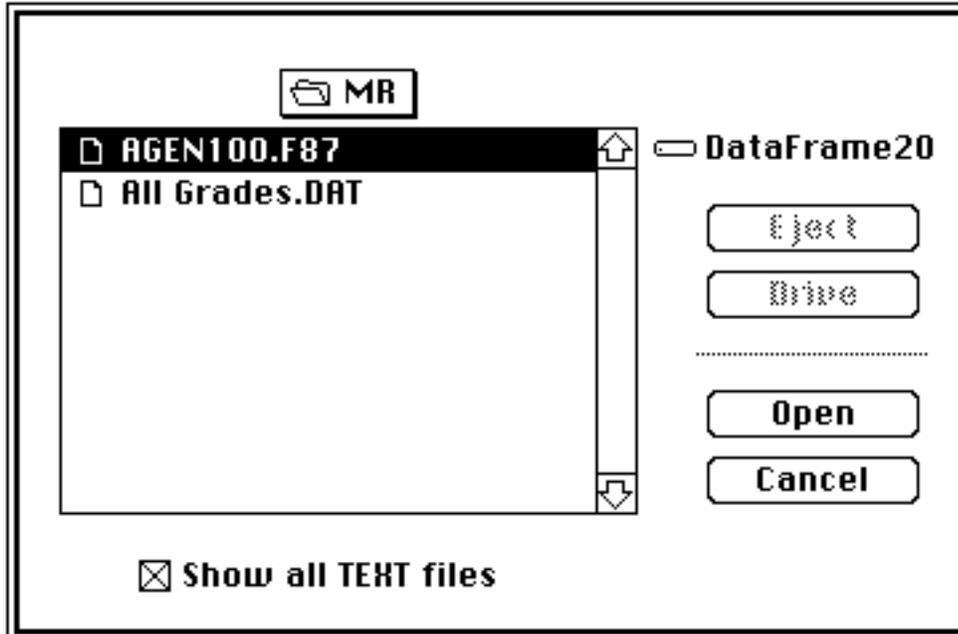


Fig 3.32 Select file

Load the data as shown below.

HW.DAT					
	1	2	3	4	5
	Column 1	Column 2	Column 3	Column 4	Column 5
1	Albright, G	67	67	65	
2	Aneshansley, I	77	86	71	
3	Bart, B	61	51	98	
4	Bartsch, E	95	55	100	10
5	Bates, W	64	95	80	
6	Becker, T	84	78	92	
7	Boss, F	52	69	90	
8	Brown, X	59	50	82	
9	Burns, A	65	71	59	
10	Campbell, I	68	55	64	
11	Caveney, S	57	89	97	
12	Cook, H	95	79	94	
13	Cook, S	68	52	62	
14	Cummings, W	58	75	93	
15	Czarniecki, E	65	86	59	
16	Czarniecki, S	94	75	80	
17	Datta, F	79	86	96	
18	Ditmars, H	68	50	95	

Fig 3.33 Data loaded in Cricket Graph

You can label the columns and produce a graph such as the following.

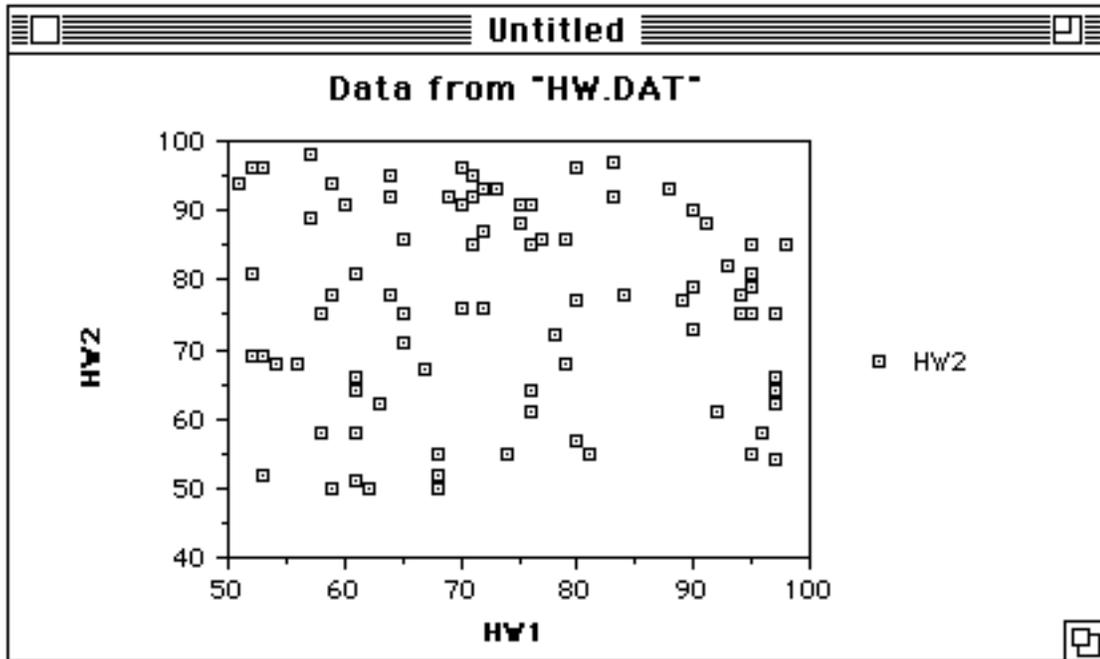


Fig 3.34 A Cricket Graph plot

Clearly there is no correlation between scores on the first and second homeworks. A plot such as this allows you to identify students whose scores on HW2 were better or worse than on HW1. Scores on a straight line with a slope of one and passing through zero correspond to identical performance on both HW1 and HW2.

### 3.6 Drop/Add Students

You can drop or add student records to the course list at any time using the **Delete** and **New** command of the **Record** menu. We have provided a more convenient import technique for massive updates.

If you have not yet added data to your existing course file, simply retire the old file and start anew using the technique of the previous section. If you have added grades, you can export the data from the old course file, create a new course file using the updated class list, and then import the grades. A better approach is to update just the Registrar portion of your course file.

Suppose the Registrar has provided you with a text file of *all* current students (not just the records being changed) in the same format as the original Registrar file.

```

Cooke, J. Robert
02
02
100
Albright, H          307446 058784598 1 02 01 01 01 0200 L
Aneshansley, I      310067 907645354 1 03 02 02 02 0200 E
Bart, B              311957 564654566 2 04 03 04 04 0200 L
Bartsch, E          301814 864654521 4 02 01 06 06 0200 L
Bates, W             284216 986565624 1 02 02 03 03 0200 L
Becker, T           311675 221245589 1 04 08 05 05 0200 L
Boss, F              309343 025874139 1 02 04 03 02 0200 L
Brown, X             276562 145065583 1 02 05 01 02 0200 L
Burns, A             307987 873233373 1 02 04 06 06 0300 L
Campbell, I         276923 456456423 4 01 02 03 03 0200 E
Student, A           333333 444444444 4 04 04 04 04 0400 E
Cook, H              290995 036678381 1 01 04 02 02 0200 L
Cook, S              297378 345687508 3 02 02 01 01 0200 L
....(more)....
Wishart, O           387897 455666490 3 02 01 06 06 0000 O

```

Fig 3.35 Portion of an update text file (AGEN100.F87Update)

- Make a duplicate of your existing course file on a separate disk so you can recover from a gross blunder.
- Load the existing course file in MR.
- Select **Import...** from the **File** menu.
- If not already done so, choose the **Standard Import from Registrar** format and verify the choice of fields using the Edit button.

- Select the import file, e.g., AGEN100.F87Update, and click **Import**.

Note: The MR does not alter the TA and IntId fields. If you wish to preserve any other fields e.g., section, you must remove that field from the format and replace it with the appropriate number of blanks.

For this demo file, we modified each of the first 10 records. The first record has a modified name; the second, a changed CUID; the third, a different SSN, etc. We deleted the Caveney record and added Student. When a record contains a CUID, MR matches the record on the basis of CUID and the first 3 letters of the last name. If the records do not contain a CUID, MR matches on the basis of the student name.

If a record has a modified name, but the same CUID, MR replaces the old record with the modified record and archives the old record. MR also archives records that are not included in the update file.

- Use **Archives...** on the **Record** menu to update the course file with the revised list.

Note: The program does not check for duplicate CUIDs in the update file. Use the **Database...** command on the **File** menu to verify that duplicates do not exist in the course file.

### 3.7 Import Grades

MR allows you to import a text file of grades. The import file need not contain data for every student, but must have the student names or CUIDs which *exactly* match the record in the course file. You can create an ASCII character delimited export file of the names and CUIDs with MR and enter the grades using a word processor, a spreadsheet program, or a specialized program. The file can also originate with a machine scoring program.

- Load the course file.
- Click **Import...** on the **File** menu.
- Edit an existing file format or create a new format to correspond to the data in the text file (See Fig 3.35).
- Select this format.
- Select the import file.
- Use **Archives...** of the **Scores** menu to check for records which did not match the name or CUID of an existing record.
- Use **Sort...** on the **Special** menu to produce a verification list.

### 3.8 Weighted Average Calculations

No.	HW	Quiz	Lab	Paper	Prelim	Exam
1	67	52			70	66
2	67	6.5				
3	65	27.6				
4	73	10				
5	54					
6	87					

Fig 3.36 Sample record

You can compute the weighted average for the above record as follows if all entries within each column are weighted equally :

$$Wt\_Ave = \sum_{j=1}^M \{ wt\%_j \times [col\ ave]_j \} \quad , \quad \text{weighted average of column average}$$

or

$$Wt\_Ave = \sum_{j=1}^M \left\{ wt\%_j \left[ \sum_{i=1}^{N_j} \left( \frac{Score_{ij}}{Max\_Pts_{ij}} \right) \right] \right\} \Bigg/ N_j$$

or

$$\begin{aligned}
 Wt\_Ave = & +0.10 \quad \frac{67}{100-0} + \frac{67}{100-0} + \frac{65}{100-0} + \frac{73}{100-0} + \frac{54}{100-0} + \frac{87}{100-0} \quad \Bigg/ 6 \\
 & + 0.20 \quad \frac{52}{100-0} + \frac{6.5}{30-0} + \frac{27.6}{30-0} + \frac{10}{27-0} \quad \Bigg/ 4 \\
 & + 0.40 \quad \frac{70}{100-0} \quad \Bigg/ 1 \\
 & + 0.30 \quad \frac{66}{100-0} \quad \Bigg/ 1
 \end{aligned}$$

$$\begin{aligned}
 Wt\_Ave &= 0.10 [0.688] + 0.20 [0.507] + 0.40 [0.70] + 0.30 [0.66] \\
 Wt\_Ave &= 64.8
 \end{aligned}$$

See a more complete discussion in **Calc. Ave...** in Chapter 4.

#### Pseudo-code

The following pseudo-code outlines the weighting algorithms used.

```
PROCEDURE Calculate Average;
```

```
    PROCEDURE Get Weighted Column Score;
```

```
        BEGIN
```

```
            WeightSum := 0; { Total of weights is initially 0 }
```

```
            FOR each row in column DO
```

```
                IF don't drop this score THEN
```

```
                    BEGIN
```

```
                        Grade := Retrieve grade from student;
```

```
                        IF grade exists THEN
```

```
                            BEGIN
```

```

        Weight := Get weight for this grade;
        WeightSum := WeightSum + Weight;{add weight to total wt}
        IF LetterGrade THEN
            Convert Letter to Number in Range 0 - 100;
        IF Using Z-Score THEN
            Grade := (Grade - Mean) / StdDev;
        ColGrade := ColGrade + Grade * Weight
    END
    END; { for }
    IF WeightSum = 0 THEN
        ColGrade := 0
    ELSE
        ColGrade := ColGrade / WeightSum
    END; { Get Weighted Column Score }

PROCEDURE Get Column Score By Points;

BEGIN
    NGrades := 0; { Number of grades found is initially 0 }
    FOR each row in column DO
        IF don't drop this score THEN
            BEGIN
                Grade := Retrieve grade from student;
                IF grade exists THEN
                    BEGIN
                        NGrades := NGrades + 1;
                        IF Number Grade THEN
                            PointSum := FormatHigh - FormatLow;
                        ELSE IF A to F Letter Grade THEN
                            {Letter grades are stored as integers from 1 to 13}
                            {Convert Letter to Number}
                            PointSum := 13 {FIX}
                        ELSE IF S/U with One Point value THEN
                            { In this format, each S is worth one point and each U is
                                worth 0 }
                            BEGIN
                                IF Just S or U THEN
                                    PointSum := 1
                                ELSE { if SS, SU, US, UU }
                                    PointSum := 2;
                                IF S, US, OR SU THEN Grade := 1
                                ELSE IF SS THEN Grade := 2
                                ELSE Grade := 0
                            END
                        ELSE { if S/U }
                            BEGIN
                                PointSum := 2;
                                IF U OR UU THEN
                                    Grade := 0
                                ELSE
                                    Grade := 1
                            END;
                        Grade := Grade / PointSum;
                        IF Using Z-Score THEN
                            Grade := (Grade - Mean) / StdDev;
                        ColGrade := ColGrade + Grade
                    END
                END; { for }
            IF NGrades = 0 THEN
                ColGrade := 0
            ELSE
                ColGrade := 100 * ColGrade / NGrades
            END; { Get Column Score By Points }

BEGIN { Calculate Average }

```

```

IF Using Z-Score THEN
  GetStatistics;
  FOR each student DO
    BEGIN
      Average := 0;    { average is initially 0 }
      FOR each score column DO
        IF Column Percent <> 0 THEN
          BEGIN
            ColGrade := 0;    { column grade is initially 0 }
            IF scoring column by weights THEN
              Get Weighted Column Score
            ELSE Get Column Score By Points
            Average := Average + ColGrade * ColumnPercent[Column]/100
          END;
        Store Average in Student Record
      END { for }
    END; { Calculate Average }
  
```

### 3.9 Export Term Grades to Registrar

You handle the export of the term results just as you did in 3.2 *Export of Data*. The export format, as defined, includes only the information essential to a unique matching with the Registrar's database.

- Click **Export...** on **File** menu.

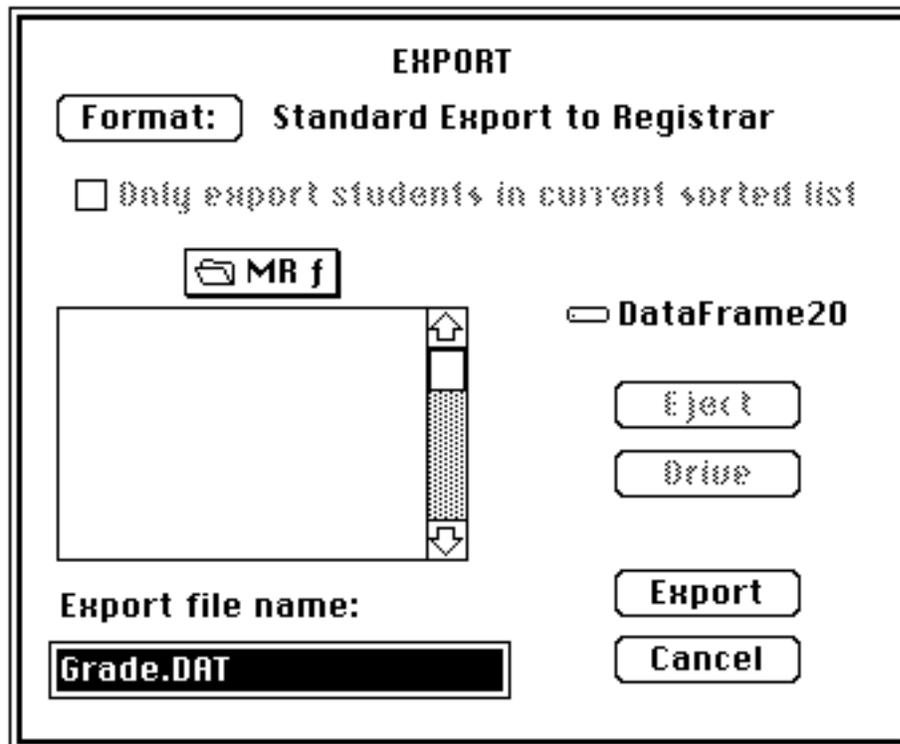


Fig 3.37 Export window

- Click on **Format** button.

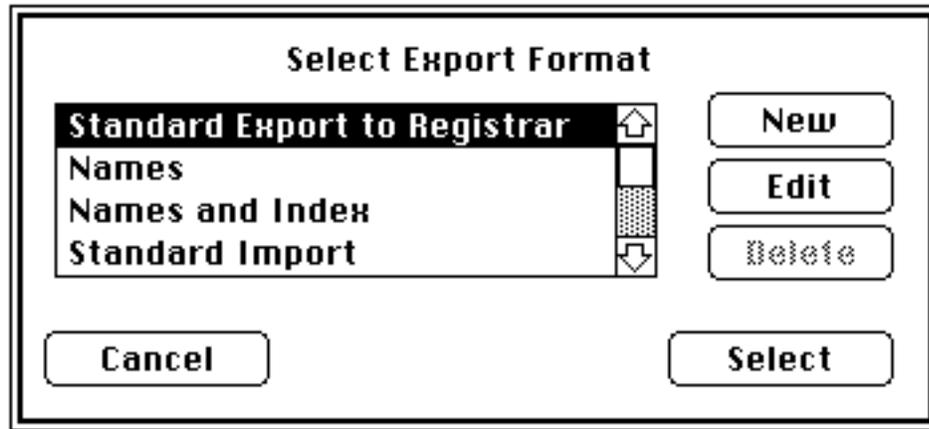


Fig 3.38 Select export format

- **Edit** the output format.
- Click **Select**.

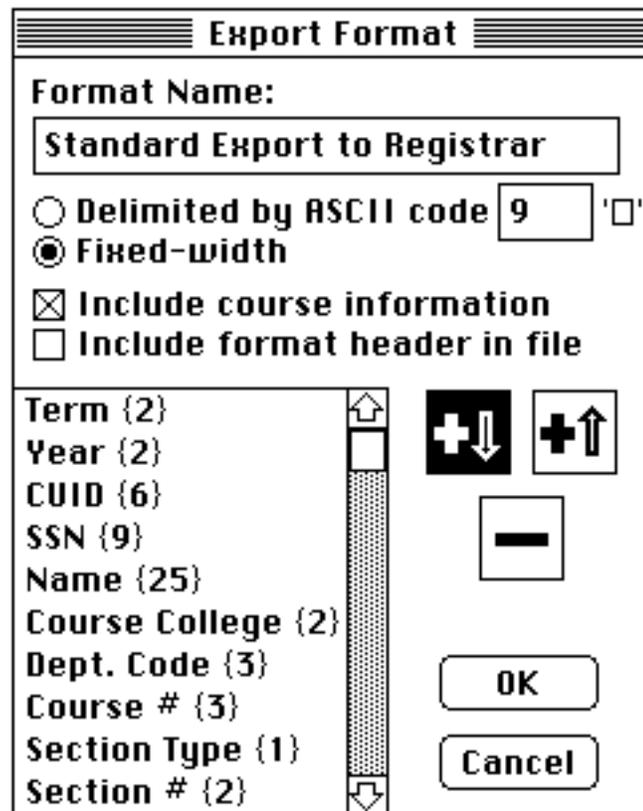


Fig 3.39 Edit format

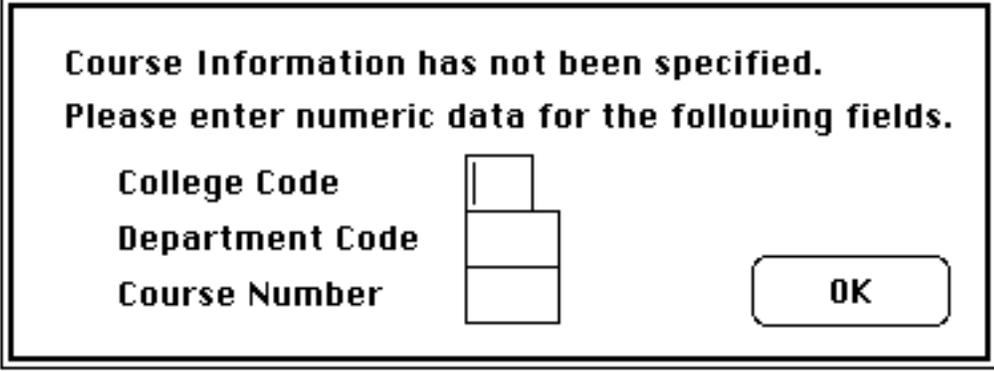
The export format is university specific; therefore consult your Registrar for instructions.

- Click **OK**.

The same window (Fig 3.37) appears to enable you to name the export file.

- Click **Export**.

If you imported your course file from the Registrar at the beginning of the term, you need not (cannot) supply the following information. If you typed your own records, you must provide the following identifying information. Consult the Registrar for these details.



**Course Information has not been specified.  
Please enter numeric data for the following fields.**

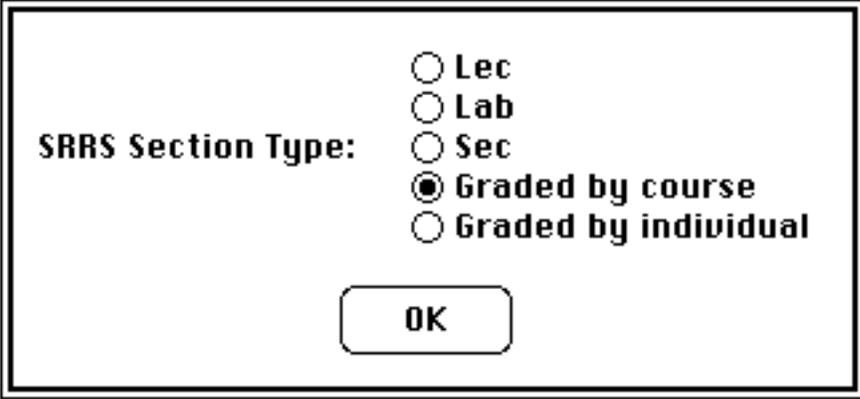
**College Code**

**Department Code**

**Course Number**

**OK**

Fig 3.40 Course identification codes



**SRRS Section Type:**

Lec

Lab

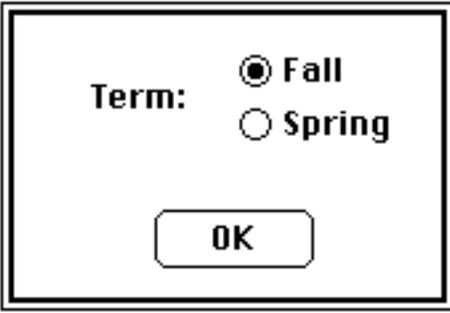
Sec

Graded by course

Graded by individual

**OK**

Fig 3.41 More course identification



**Term:**

Fall

Spring

**OK**

Fig 3.42 Term identifier

- Make a printed backup now using **Sort...** of the **Special** menu.
- This completes the export process.

# Chapter 4 Reference Guide

This chapter provides a detailed discussion of each pull-down menu ( Fig. 4.1).

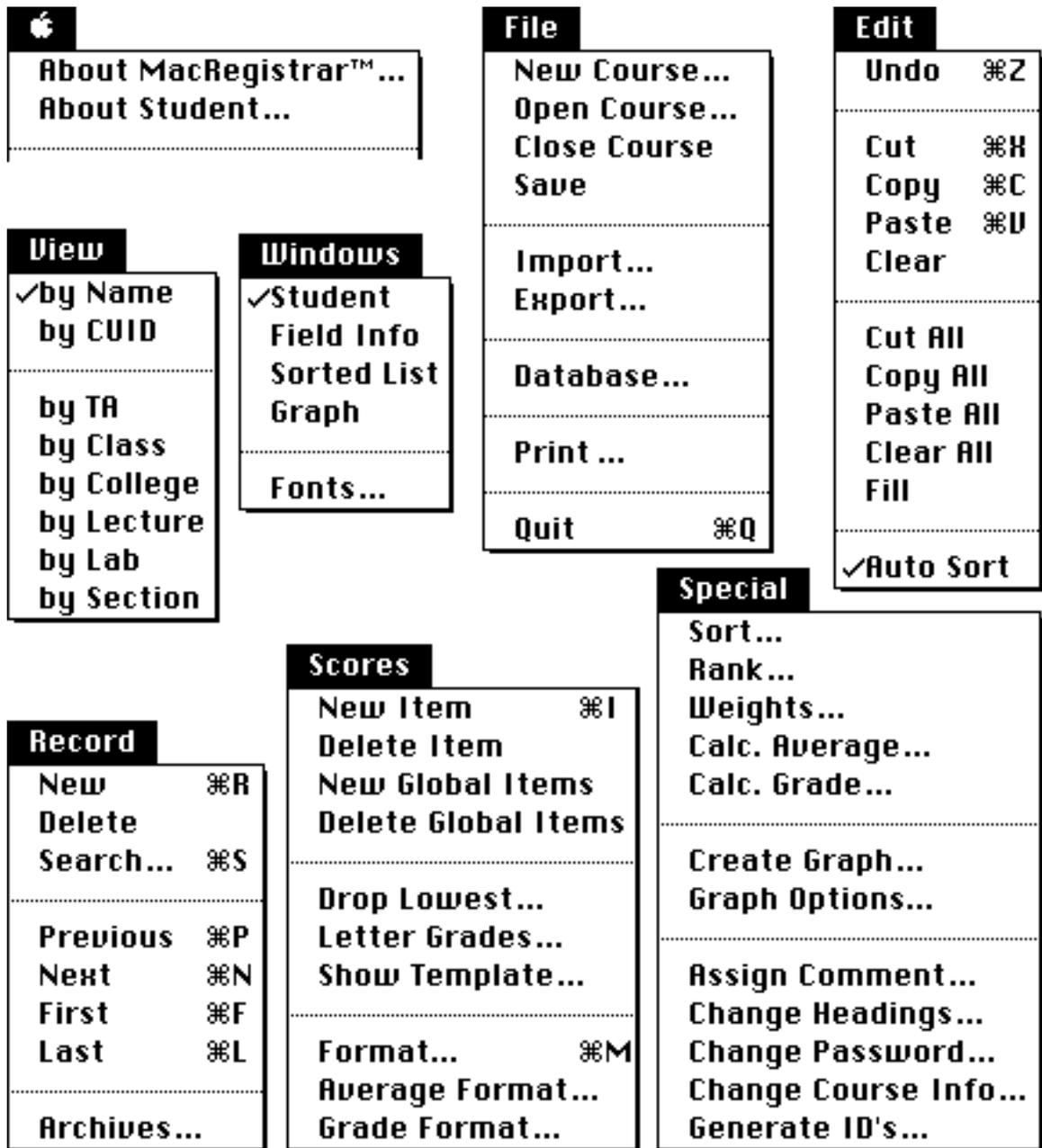


Fig 4.1 Pull-down menus

Let's discuss each menu.

## Apple Menu

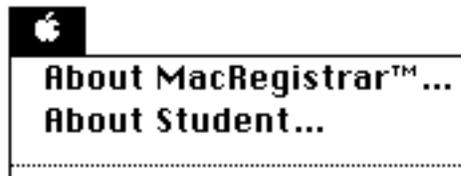


Fig 4.2 Apple menu

### 4.1 About MacRegistrar™...

The copyright notice, license information, and authors are acknowledged here.

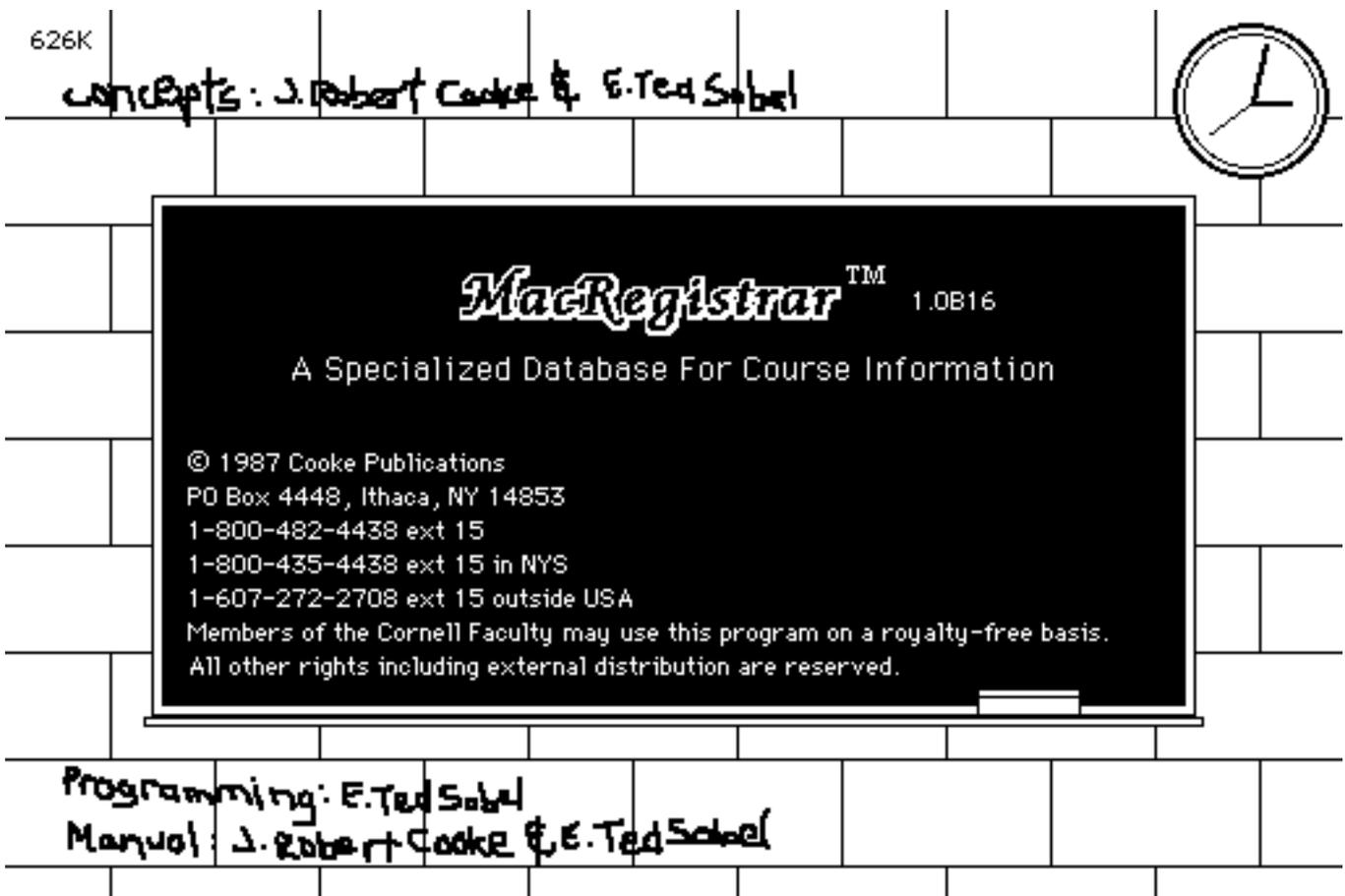


Fig 4.3 Copyright notice and credits

### 4.2 About Student...

The second entry, available only when a course is open, provides access to free-form text notes about each student. Scroll to access the notes on each student. If you have added or deleted records from the database, click **Update** to reconstruct the Notes list.

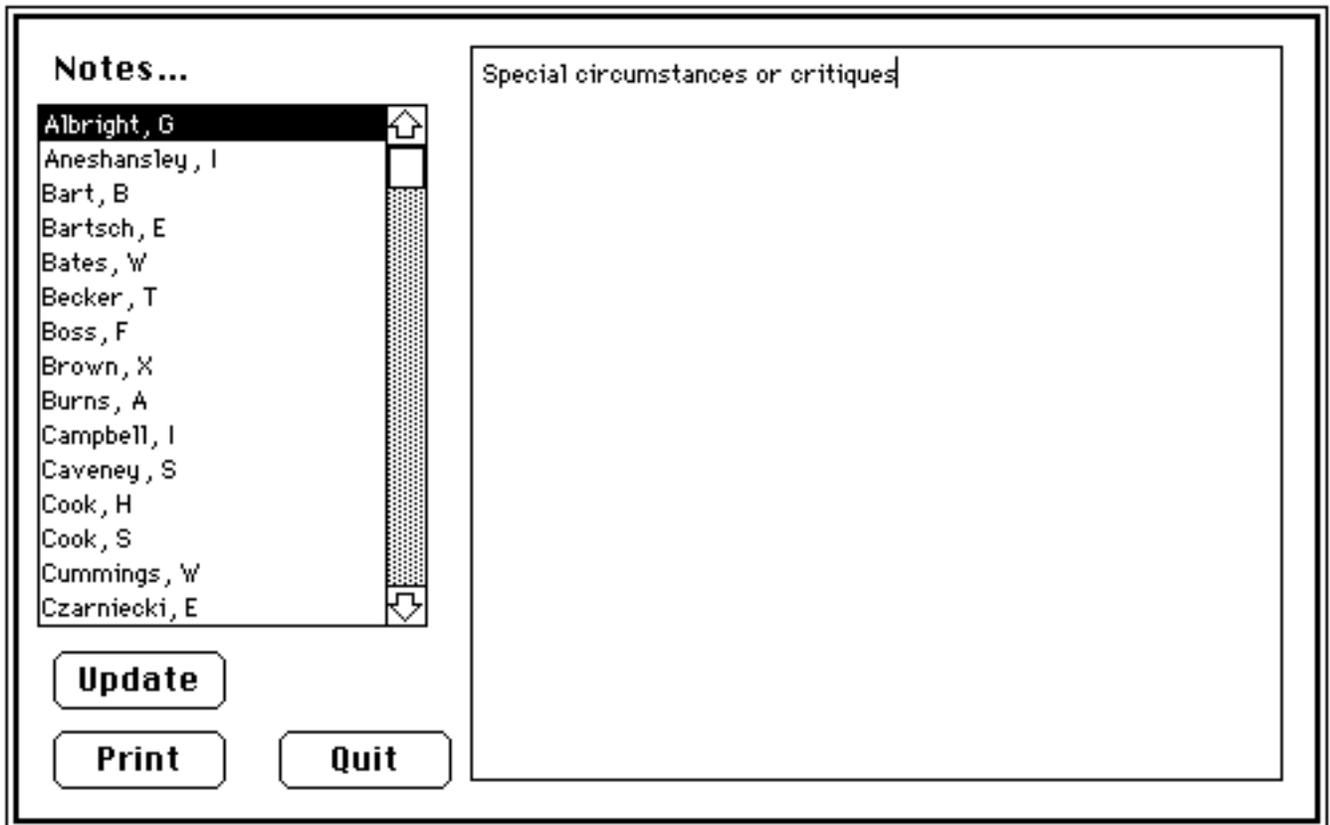


Fig 4.4 Text (e.g., paper critiques, special circumstances) can be filed

## File Menu

The File menu (Fig. 4.5) handles the interactions with the filing system (create a new course file, open an existing course file, close the open course file, importing student records from a text file into MacRegistrar, exporting records from MacRegistrar into a text file), perform some maintenance/utility functions on the database, sending student records to the printer and ending a session.

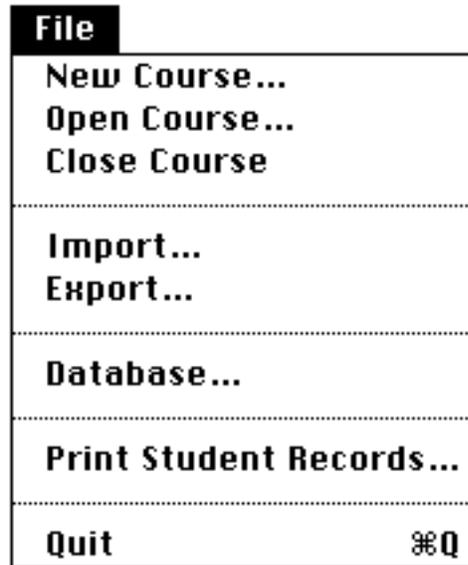


Fig 4.5 File menu

As is customary, the second menu provides access to the disk file system.

### 4.3 New Course...

Use **New Course...** to initiate a new course file. MacRegistrar then asks you to supply: a) Course Name, i.e., the file name, and b) Disk

Next, complete the remaining items in the **Course Information** window (Fig 4.6)— Instructor's Name, Course College Code, Course Department Code, Course Number, and free-form notes such as date, room, or other miscellaneous information.

Course Information	
Instructor's Name	Cooke, J. Robert
Course Name	Intro to Agr Engr
Course College	CALS
Course Department	Agr Engr
Course Number	100
Notes	Fall 87
<div style="display: flex; justify-content: space-between;"> <span>Cancel</span> <span>OK</span> </div>	

Fig 4.6 Course information window

The **Password** window (4.7) requests an optional password. If you elect to use a password, MacRegistrar asks you to supply that information in order to access the database. Physical security of the storage medium, however, is the preferred strategy.

Set Password (<Return> if none)
Pass
OK

Fig 4.7 Password window

#### 4.4 Open Course...

Use **Open Course...** to access any existing course file. The data files do not have to be on the same disk as MacRegistrar. Only one course file may be open at a time; if necessary, use **Close Course** first.

## 4.5 Close Course

Use **Close Course** to close a course file. MacRegistrar then updates the file indices and issues an end-of-file marker. Since several windows can exist (Student, Field Info, Sorted List, and Graph), clicking on a window close box does not close the course file. Only one course file can be active at a time; therefore, you must close the open course file before you can open another.

## 4.6 Save

Use Save frequently to assure a backup of your database in the event of catastrophic failure. In the event of a power failure, you can recover your file just as it was constituted at the last Save or when the file was opened, whichever event was most recent. MacRegistrar also produces a backup file when you close the course file — unless you press the *option* key when you close the file. You should make a backup just before you make global changes, e.g., during import of data. **ALWAYS maintain a backup of important data.**

## 4.7 Import...

Use **Import...** (of the File menu) to bring text file data into an open course file (Fig. 4.8).

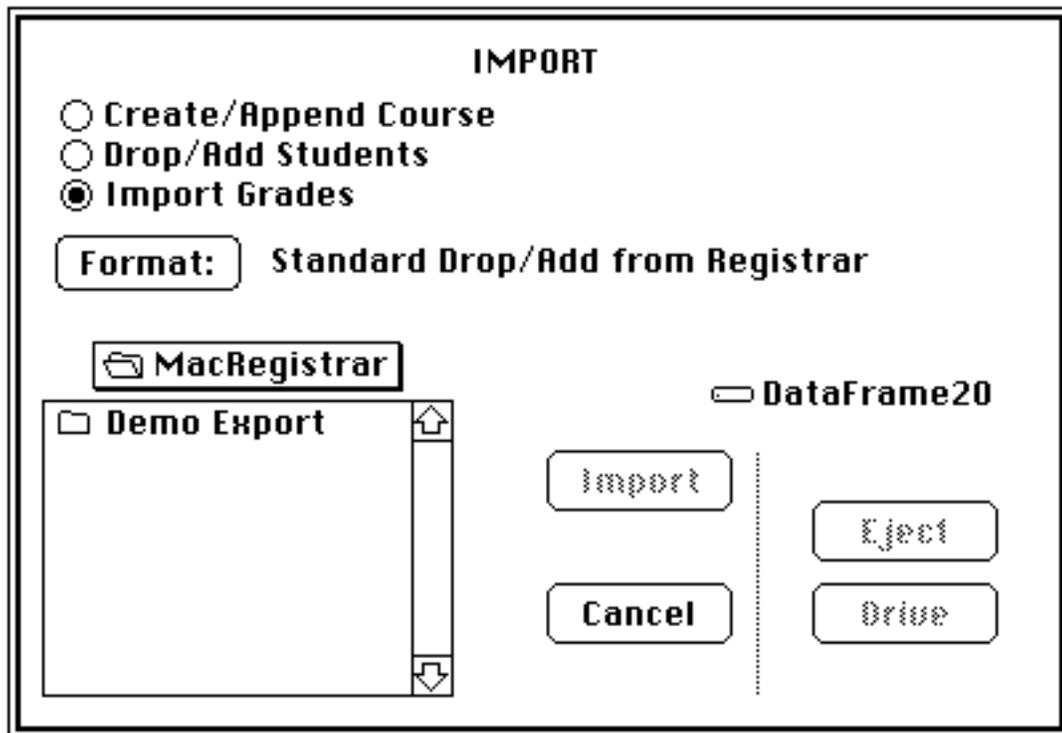


Fig. 4.8 Import Dialog

Select the type of import data:

- 1) *add* student names and registration data to a new or existing course, **Create/Append Course**
- 2) update existing student records of a course in progress (e.g., add or drop records, or modify section ,credit and other information), **Drop/Add Students**

3) match records by name or identification number and then insert data into the selected grade fields, **Import Grades**

Identify the file (drive, folder, and name).

Click **Format** to create or to select a different import format (Fig. 4.9).

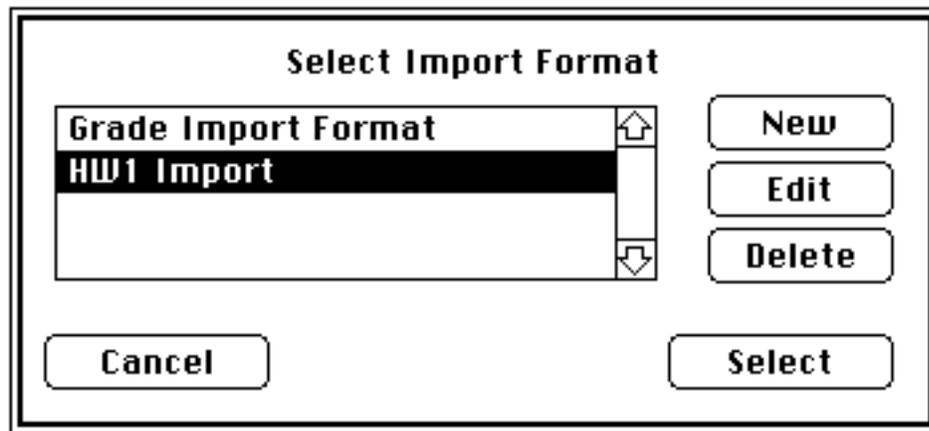


Fig 4.9 Select, create, edit, or delete an import format

The program saves the format specifications as a MacRegistrar resource. If the desired format already exists, you need only click on **Select** (Fig 4.9). Otherwise, click on **New** to create a customized format or **Edit** to modify an existing format. Use **Delete** to remove unwanted formats.

- Click **Edit**.

The **Import Format** window (Fig. 4.10) allows you to name the format and to specify field type (either fixed width or variable width) and the field delimiter if you select a variable width field. You can enter the field delimiter as a decimal ASCII number or select it from a table that appears when you click on the symbol to the right of the ASCII code field.

Additional identifying information can precede the tabular data. Format header (Fig 4.11) identifies the entries in each record, and course information identifies the course. See the Appendix for a discussion of the format header.

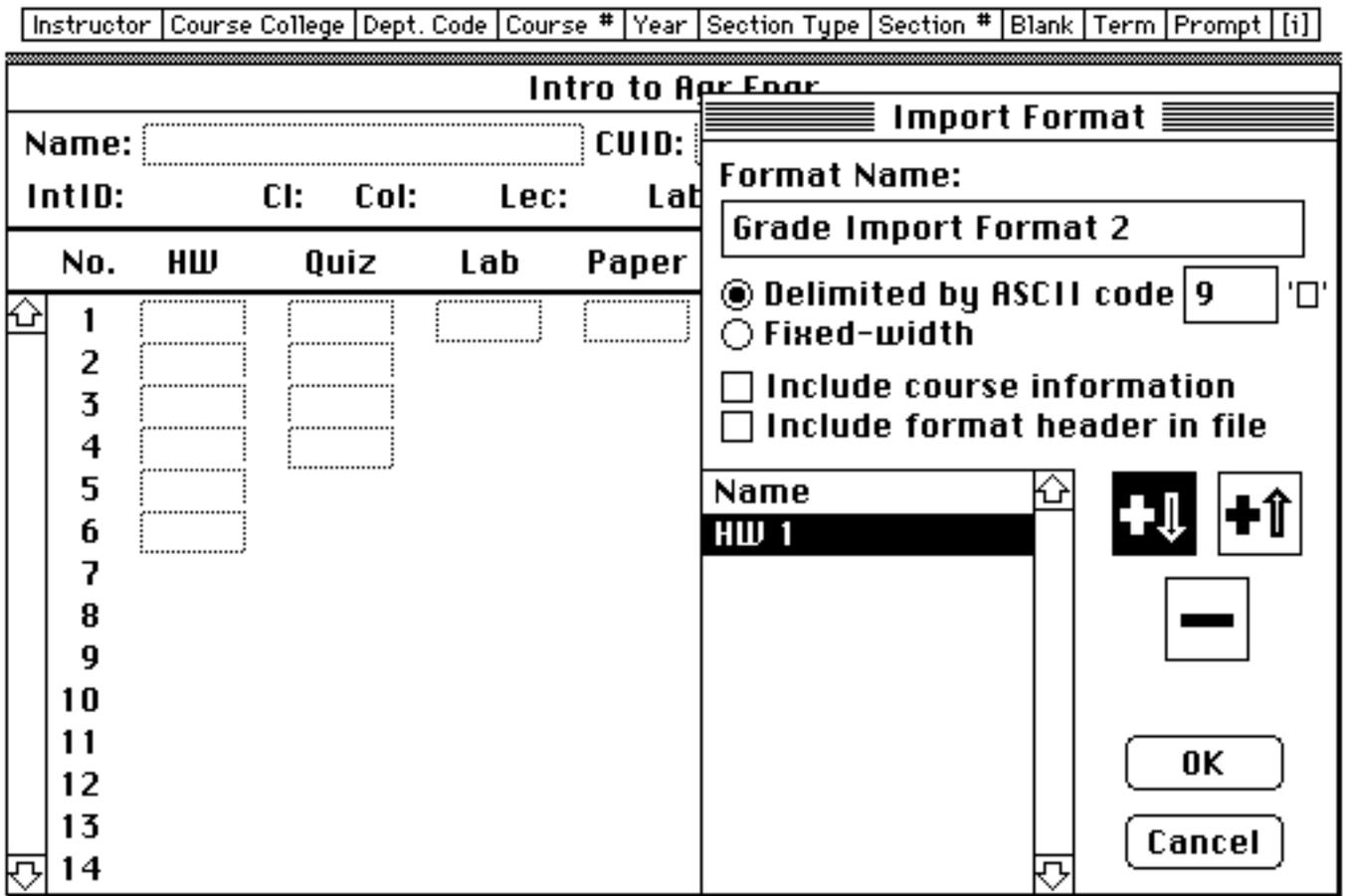


Fig 4.10 Define an import format

```

%%edci070900130101130102130103130104130105130106%%
Cooke, J. Robert
02
02
100
Albright, G          67   52   *   *   70   66
Aneshansley, I      77   99   *   *   84   95
Bart, B              61   86   *   *   77   64
Bartsch, E           95   83   *   *   58   74
Bates, W             64   76   *   *   94   68

```

Fig 4.11 Text file with one line header information, four lines of course information, and five records

See the Appendix for a description of the header.

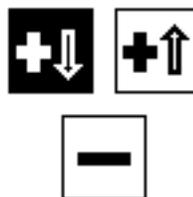
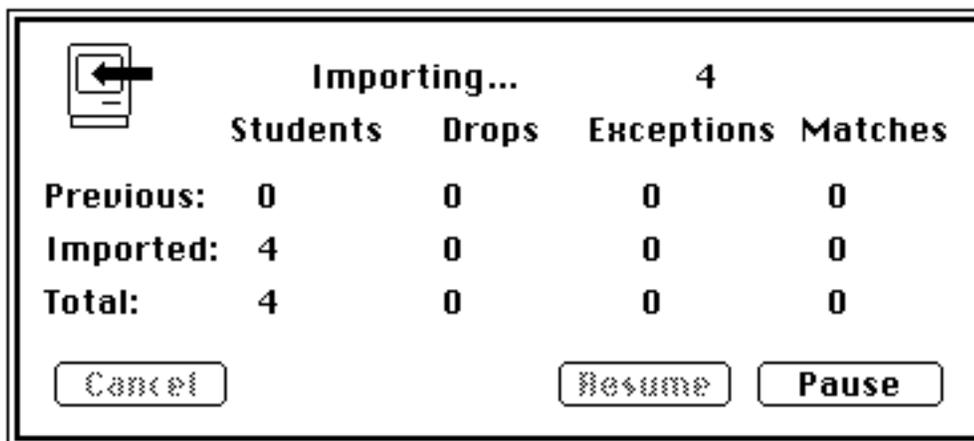


Fig 4.12 Add and delete icons

The three remaining icons allow you to delete the selected field or add fields before or after the current field selection.

After you click **OK**, MacRegistrar returns you to the **Select Import Format** window with the most recently edited format as the default. Click **Select** to choose the format and return to the **Import** window.

Click **Import** to initiate data transfer.



The dialog box titled "Importing..." shows a progress indicator on the left with a left-pointing arrow. The table below displays the following data:

	Students	Drops	Exceptions	Matches
Previous:	0	0	0	0
Imported:	4	0	0	0
Total:	4	0	0	0

At the top right of the dialog, the number "4" is displayed. At the bottom, there are three buttons: "Cancel", "Resume", and "Pause".

Fig 4.13 Import status

During a **Create/Append** operation duplicate names are counted in **Matches** (Fig 4.13). During a **Drop/Add** operation names in the course file which are not in the update file will be listed as **Drops**. During an **Import Grades** operation names in the import file which are not found in the course file database are counted as **Exceptions**. Any of these records can be retrieved or permanently deleted using **Archives...** of the **Record** menu. If both names and CUIDs are included in the course file and in the import file, records are matched by CUID and the first three letters of the last name. If CUIDs are not included, only names are used to establish the correspondence of records. Use the **Database...** command of the **File** menu to verify that your database contains no duplicate names or CUIDs; this check is not made automatically.

#### 4.8 Export...

Use **Export...** (on the File menu) to send course data from your course file into a text file.

Identify the file (drive, folder, and name).

Click **Format** to create or to select a different export format.

The program saves the format specifications as a MacRegistrar resource. If the desired format already exists and has been selected, you need only click on **Export**. Otherwise click on **Format**.

Select a format, click **New** to create a customized format, or click **Edit** to modify an existing format. Use **Delete** to remove unwanted formats.

- Click **Edit**.

The **Export Format** window allows you to name the format and to specify field type (either fixed width or variable width) and field delimiter if you select a variable width field. You can enter the field delimiter as a decimal ASCII number or select it from a table that appears when you click on the symbol to the right of the ASCII code field.

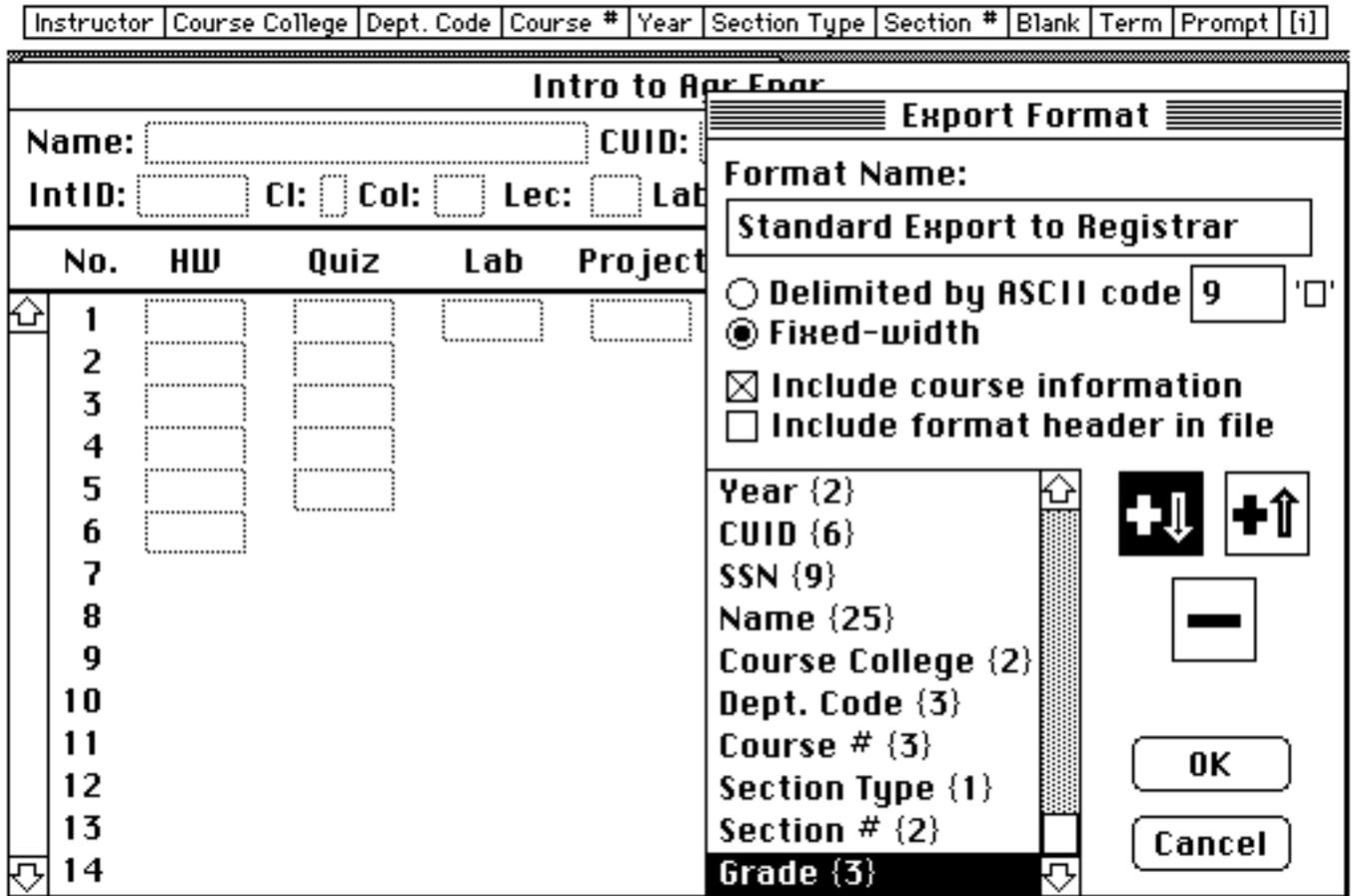


Fig 4.14 Fixed width fields

In addition to the student information and course grade fields, course information fields appear on the top row of the screen. A blank space is often useful.

Additional identifying information can precede the tabular data. Course identifies the course, and the format header (Fig 4.11) identifies the entries in each record.

The three remaining icons allow you to delete the selected field or add fields before or after the current field selection. Double clicking on a selected field name allows you to change the field length.

After you click **OK**, MacRegistrar returns you to the **Select Export Format** window with the most recently edited format as the default. Click **Select** to choose the format and return to the **Export** window.

Click **Export** to initiate data transfer.

The import/export capability is a particularly important and powerful feature. You can export data to a statistical application such as DataDesk™, to a spreadsheet such as Excel™, to a

graphical program such as Cricket Graph™, or to any other application which allows standard ASCII text file input. You can, of course, also use the clipboard, to transfer information. See Chapter 3 for illustrative examples.

#### 4.9 Database...

The Database command on the File menu provides several utility functions (Fig. 4.15)



Fig 4.15 Database preferences

**Preload data** causes MacRegistrar to keep the maximum feasible amount of data and indices in RAM for faster response.

Use **Make backup** to produce a duplicate copy of the database from within MacRegistrar automatically when you close a file. Of course, you can make duplicate copies of the course file and Notes file using **Duplicate** on the **File** menu.

Use **Check Names & Ids** to verify that your course file does not contain duplicate names or duplicate CUIDs (Fig. 4.16).

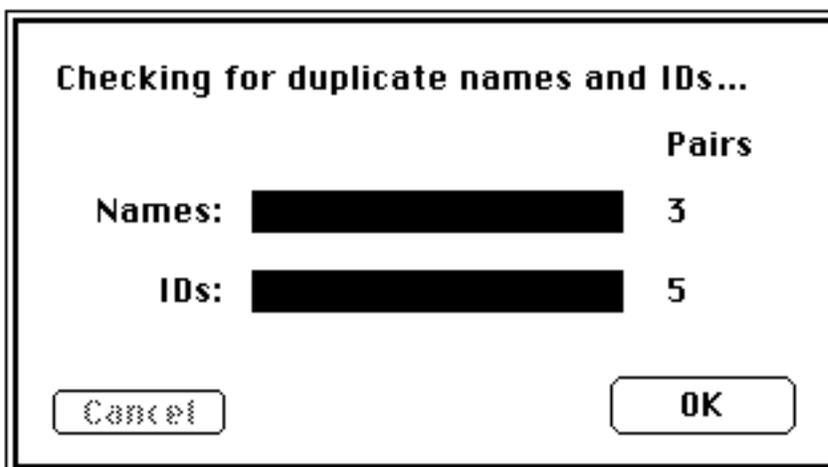


Fig 4.16 Count the duplicate names and IDs

If duplicates are found, you may create a list of them (Fig. 4.17 and Fig. 4.18)

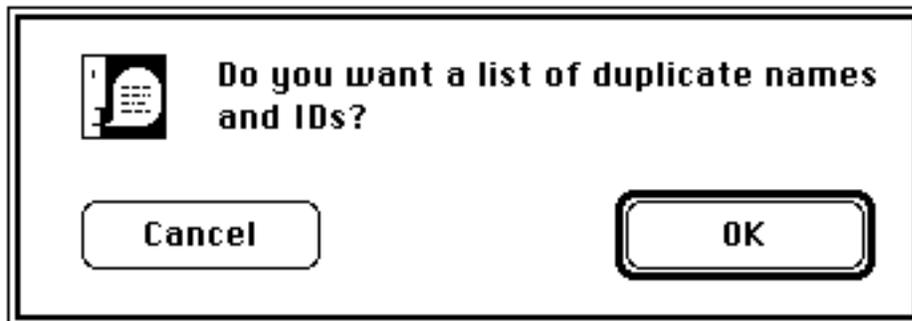
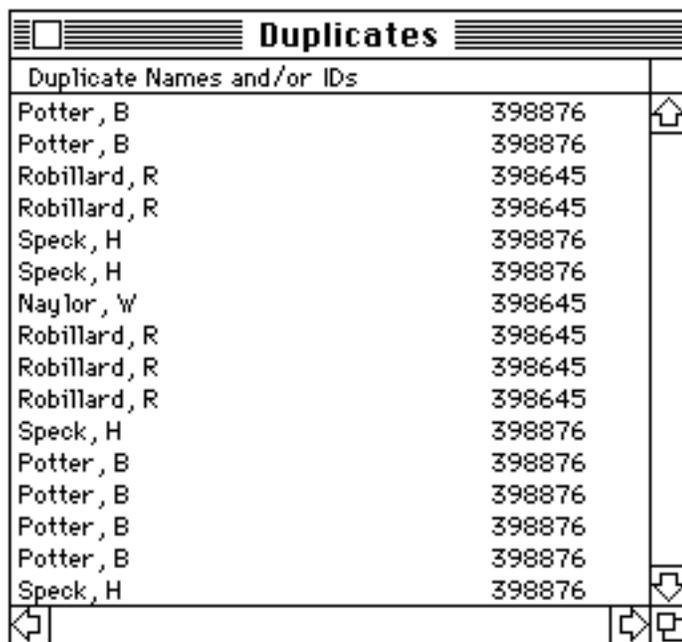


Fig 4.17 Show the duplicates



A window titled "Duplicates" with a scrollable list of duplicate names and IDs. The list is as follows:

Duplicate Names and/or IDs	
Potter, B	398876
Potter, B	398876
Robillard, R	398645
Robillard, R	398645
Speck, H	398876
Speck, H	398876
Naylor, W	398645
Robillard, R	398645
Robillard, R	398645
Robillard, R	398645
Speck, H	398876
Potter, B	398876
Speck, H	398876

Fig 4.18 The list of duplicates

- Return to the Student window and remove the duplicate names and Ids.
- Purge the duplicate records noted in the **Archives...** window of the **Record** menu.

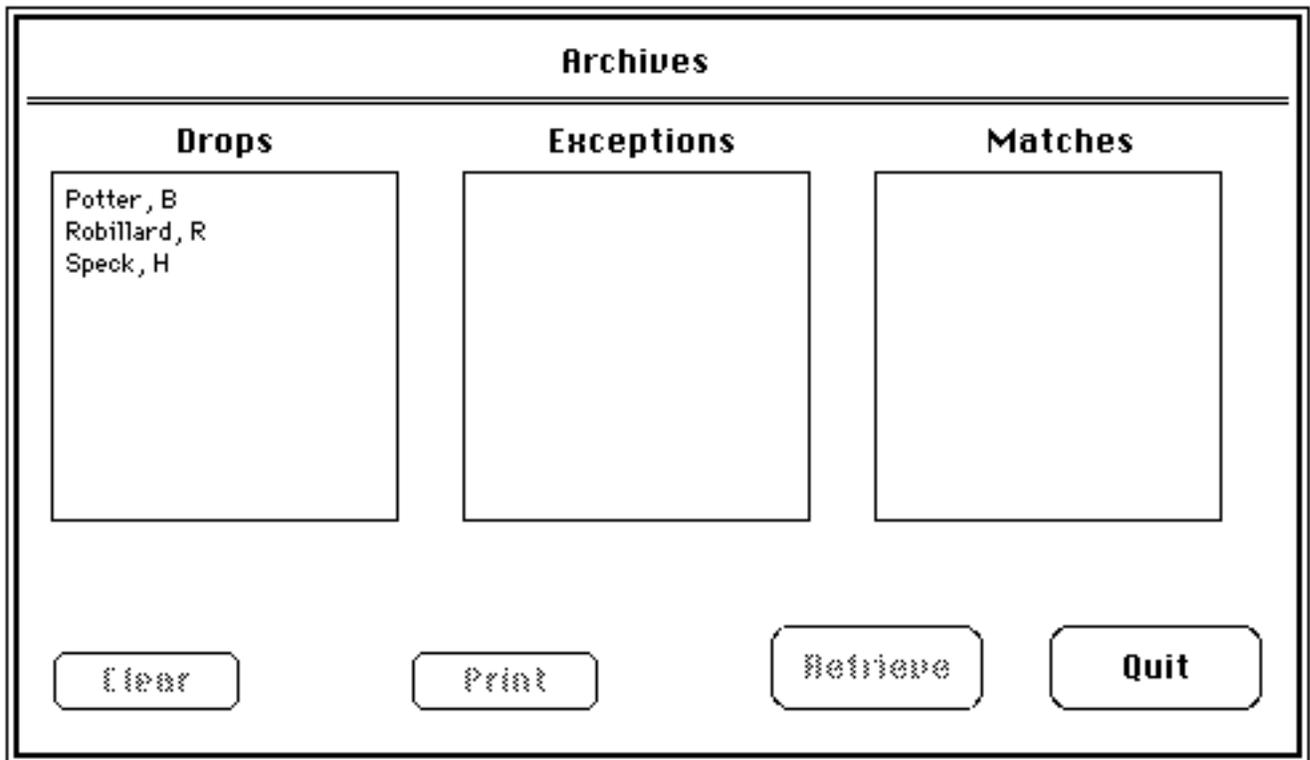


Fig 4.19 Archives list of Drops

#### 4.10 Print Student Records..., Print Sorted Lists... , and Print Field Info

You can send output to the LaserWriter, ImageWriter, or a file by this command. Use **Chooser** on the  menu to select the appropriate driver.

Use this command to print composite student records if the Student window is active.

If the ImageWriter driver is active, you could select **Final** or **Draft** quality output. In any case, you can print a single record, all records, all records in a selected group (e.g., TA, Class, College, Lecture, Lab, or Section, provided you select the category in the **View** menu), or any combination of student records.

If you choose the latter, i.e., **Selected students**, you can:

- identify a single record by typing part of the name and pressing *return* or by scrolling the desired name into view and clicking on it

- select a contiguous group of names using the technique above to select the first name in the list, scroll until the last name in the desired group is visible, and then shift-click on it to designate the entire range

- select a discontinuous group using the technique above to choose the first name, scroll until the next desired name is visible, and then command-click to add it to the developing list

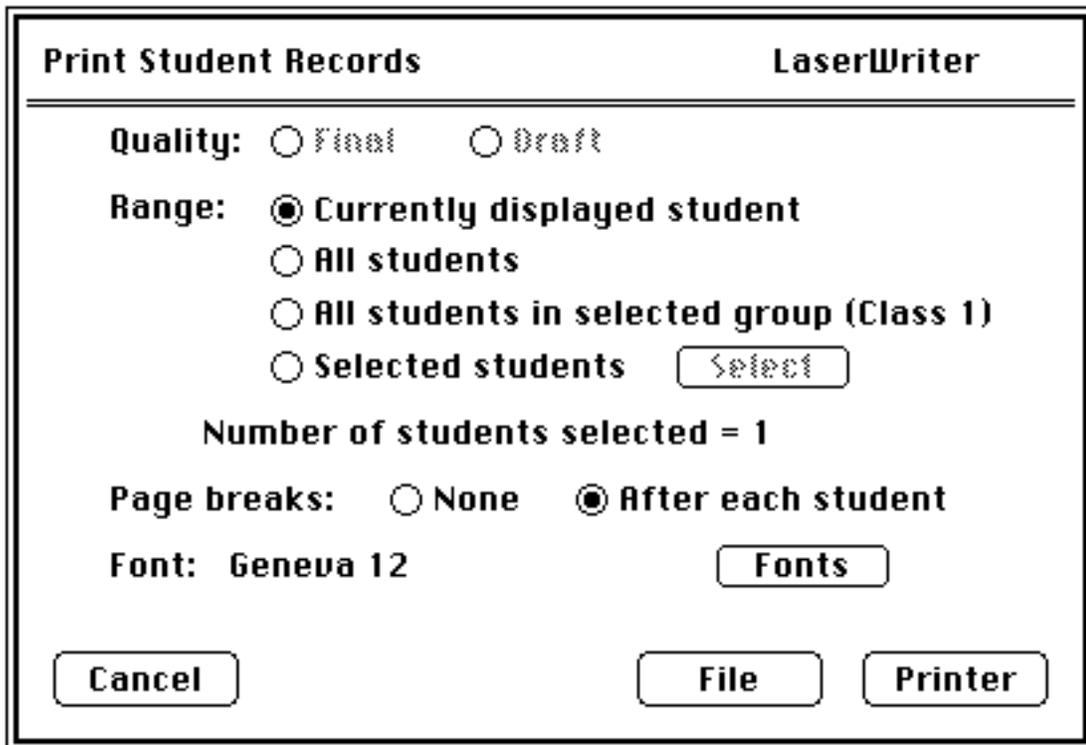


Fig 4.20 Specify student record output

- Click **OK** when your selections are complete.

Except for specifying the placement of page breaks and the font and font size, MacRegistrar automatically formats the records for you.

- Click on **Fonts** to select the font and font size for the output.

Note: The font sizes in the system file appear in the middle column. You can enter other sizes in the third column box, and MacRegistrar will generate them.

At this point you can route the output to the printer or to a MacDraw PICT file.

### ***Sorted List Output (one line per student).***

If you use the ImageWriter, you can specify **Final** or **Draft** output quality, the print range, and a page header on the first or on all pages. Page numbering is optional. Single or double spacing is available. You can select line and page breaks. You can use any font in the system file. If the line length exceeds the width of a single page, MacRegistrar automatically creates additional pages and designates placement with an alphabetical suffix. Should you wish to bind the output, you can assign the left margin. You can route the output to the printer or to a MacDraw PICT file.

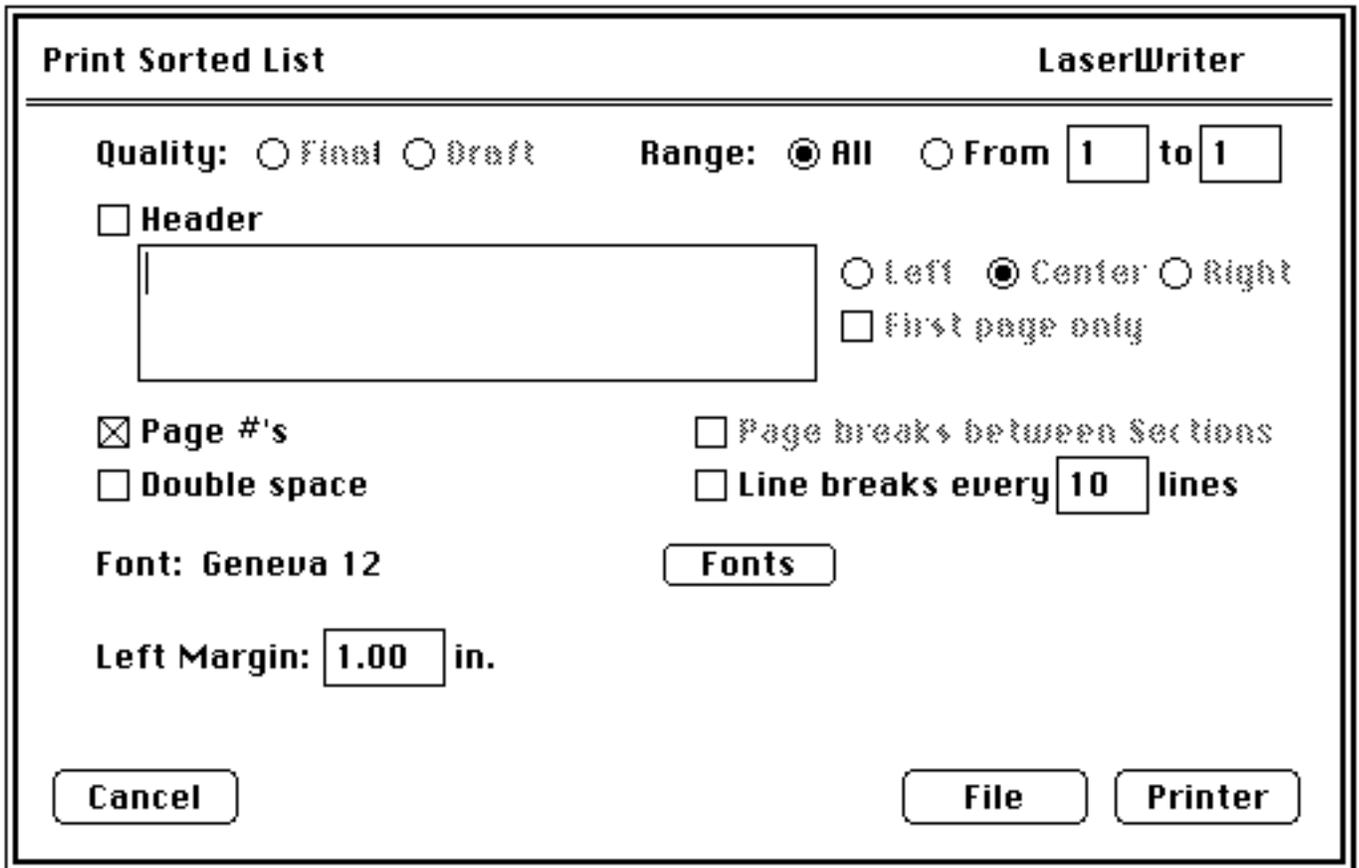


Fig 4.21 Specify sorted list output

#### 4.11 Quit

By convention, the last item of the **Edit** menu is **Quit**. This command also closes the course file and MacRegistrar.

## **Edit Menu**

The Edit menu provides the usual editing commands and some global commands that affect all records (Fig. 4.22)

<b>Edit</b>	
<b>Undo</b>	<b>⌘Z</b>
<hr/>	
<b>Cut</b>	<b>⌘H</b>
<b>Copy</b>	<b>⌘C</b>
<b>Paste</b>	<b>⌘V</b>
<b>Clear</b>	
<hr/>	
<b>Cut All</b>	
<b>Copy All</b>	
<b>Paste All</b>	
<b>Clear All</b>	
<b>Fill</b>	
<hr/>	
<input checked="" type="checkbox"/> <b>Auto Sort</b>	

Fig 4.22 Edit menu

### **4.12 Undo**

You can undo most commands immediately after you execute them. Undo and Cancel provide a measure of security against mistakes.

### **4.13 Cut**

**Cut** removes highlighted material from its current location to the clipboard for subsequent transfer to another location or application.

### **4.14 Copy**

**Copy** transfers highlighted material to the clipboard for subsequent transfer to another location or even to another application but does not remove it from its current location.

### **4.15 Paste**

**Paste** transfers the contents of the clipboard to the location designated by the cursor. The contents of the clipboard remain unchanged.

### **4.16 Clear**

**Clear** deletes the contents of the currently selected field, leaving the contents undefined.

#### **4.17 Cut All**

**Cut All** copies the contents of the current field of ALL records to the clipboard and cuts the values from all of the records.

#### **4.18 Copy All**

**Copy All** copies the contents of the current field of ALL records to the clipboard but leaves the values from all of the records unchanged.

#### **4.19 Paste All**

**Paste All** transfers the contents of the clipboard created by a **Cut All** or **Copy All** command into the respective records at the location designated by the cursor.

#### **4.20 Clear All**

**Clear All** deletes the contents of the currently selected field on ALL records, leaving the contents undefined.

#### **4.21 Fill**

Use **Fill** to assign the contents of the currently selected field to the corresponding field of every record.

#### **4.22 Auto Sort**

Disable this option for faster record entry when you use the keyboard to enter data.

## View Menu

Use the **View** menu (Fig. 4.23) to designate the category and order of records you see during a scroll through the records.

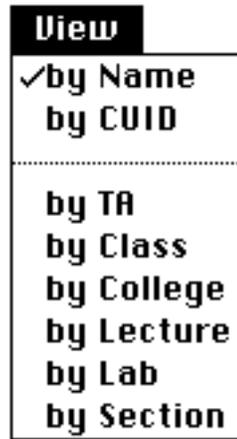


Fig 4.23 View menu

### 4.23 by Name

You can use the student name (usually in “Last, First Middle” format) to index the files for rapid access. Use the same format, e.g., consistent use of commas, throughout to maintain the proper sort order.

### 4.24 by CUID

You can use the CUID (student Identification Number), as well as student name, to index the files for rapid access. This number is used in addition to name to establish import matches.

### 4.25 by TA

You can further restrict searches and scrolls by student name or identification number to include only those records having a common teaching assistant. See 4.30 for additional details.

### 4.26 by Class

You can further restrict searches and scrolls by student name or identification number to include only those records belonging in a common class such as freshman, sophomore, etc. See 4.29 for additional details.

#### 4.27 by College

You can further restrict searches and scrolls by student name and identification number to include only those records having a common college of enrollment. See 4.30 for additional details.

#### 4.28 by Lecture

You can further restrict searches and scrolls by student name or identification number to include only those records having a common lecture number. See 4.30 for additional details.

#### 4.29 by Lab

You can further restrict searches and scrolls by student name or identification number to include only those records having a common lab assignment. See 4.30 for additional details.

#### 4.30 by Section

You can restrict searches and scrolls by student name or identification number to include only those records having a common section. When you have selected one of the six subcategories, an additional scroll bar appears at the bottom corner of the screen (Fig. 4.24).

Click on the right or left arrow to select the next subcategory.

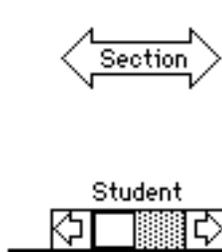


Fig 4.24 Subcategory and record scrolls

Click on the shaft of the arrow to obtain a list of all the subcategories; you can select any subcategory directly from this list. Either click on a category and click **Select** or just double-click on the category (Fig. 4.25).

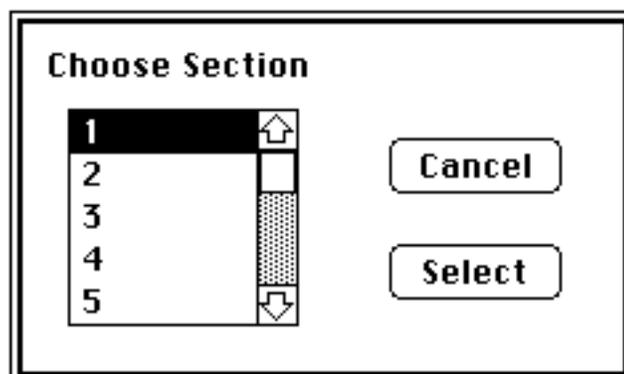


Fig 4.25 Category selection window

## Record Menu

The Record menu (Fig. 4.26) provides commands for creating, deleting and locating student records ( by sequential and by search techniques). This menu also provides commands for the disposition of inactive records placed in the archives (which are saved in a separate archive, rather than being permanently lost when deleted). The Archives command also handles the disposition of duplicates and records removed by a drop/add action during the term.

A screenshot of a menu titled "Record". The menu items are: "New" with a keyboard shortcut "⌘R", "Delete", "Search..." with a keyboard shortcut "⌘S", a horizontal separator line, "Previous" with a keyboard shortcut "⌘P", "Next" with a keyboard shortcut "⌘N", "First" with a keyboard shortcut "⌘F", "Last" with a keyboard shortcut "⌘L", another horizontal separator line, and "Archives...".

Record	
New	⌘R
Delete	
Search...	⌘S
-----	
Previous	⌘P
Next	⌘N
First	⌘F
Last	⌘L
-----	
Archives...	

Fig 4.26 Record menu

### 4.31 New

Use **New** to create new, blank student records.

### 4.32 Delete

Use **Delete** to remove the displayed record. The deleted records are archived; therefore, the equivalent of an undo command exists. Use the Archives command for the disposition of deleted records.

### 4.33 Search

Successful database usage depends upon convenient and rapid data retrieval. Sequential retrieval by student name or identification is discussed in sections 4.34 through 4.37. Retrieval in an arbitrary order is also necessary and is provided by this command.

**Scroll to locate and to retrieve a record.**

- Type command S to obtain the menu of names.
- Use the scroll bar at the right to find the name of the student whose record you wish to retrieve, e.g., **Speicher, M.**

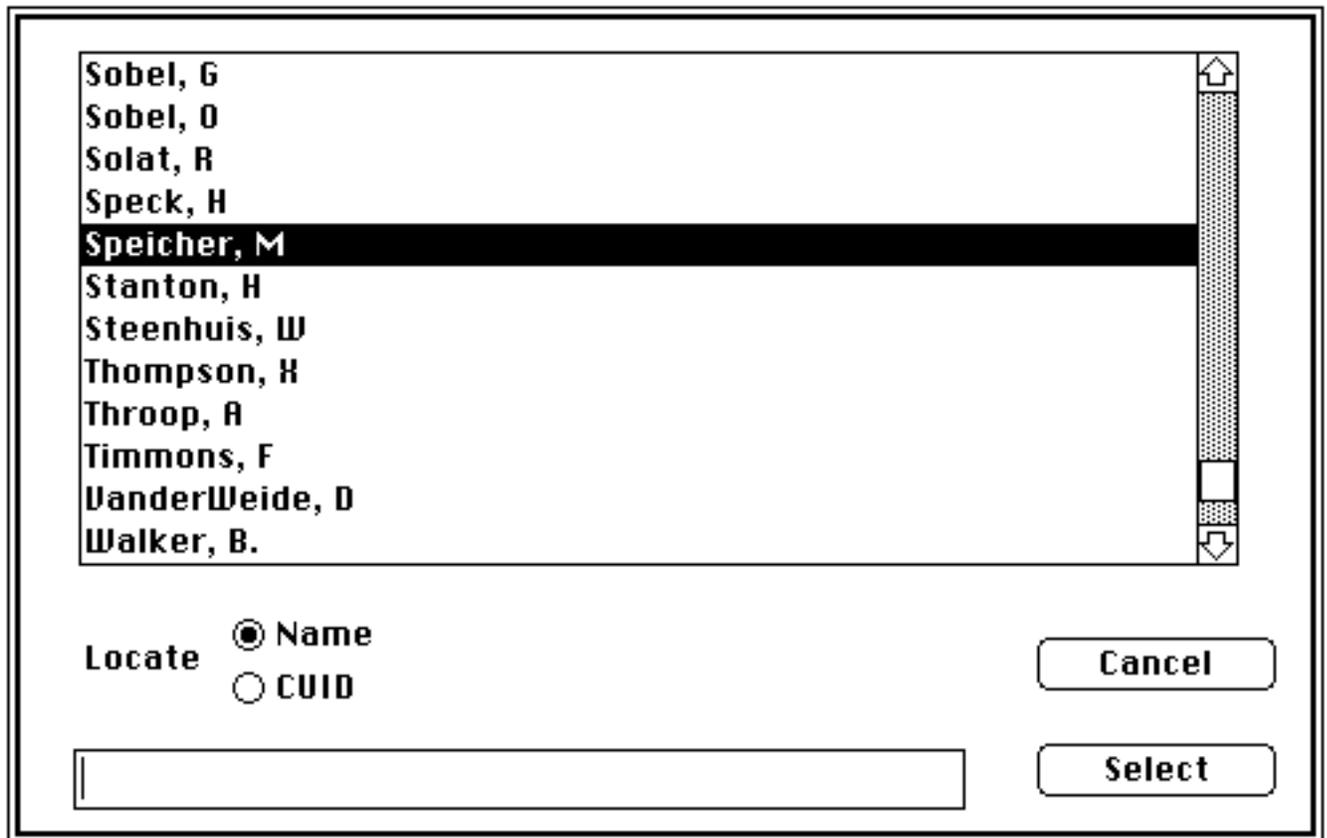


Fig 4.27 Scroll and double-click to select

- To retrieve the record, double-click on the desired name when it comes into view.

Notice that the cursor remains in the same field as you select different records. This expedites the grade entry process.

***Type a few leading characters to locate a record***

- Type command S to obtain a menu of names again.

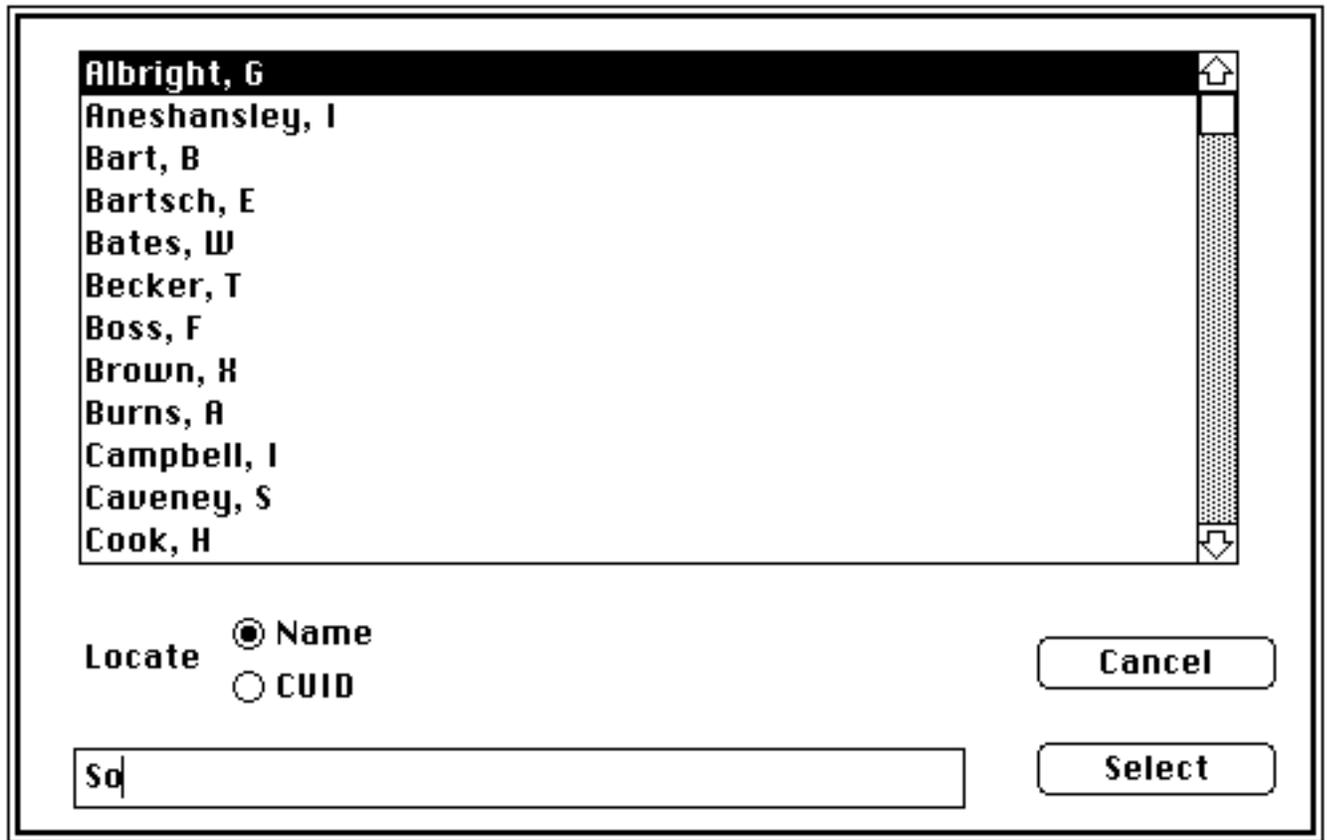


Fig 4.28a Selection window

- Type **So** and press **Return**.

Note: **Return** accepts keyboard entries; **Select** accepts scroll bar entries.

- Double-click on **Sobel, O** to select that record.

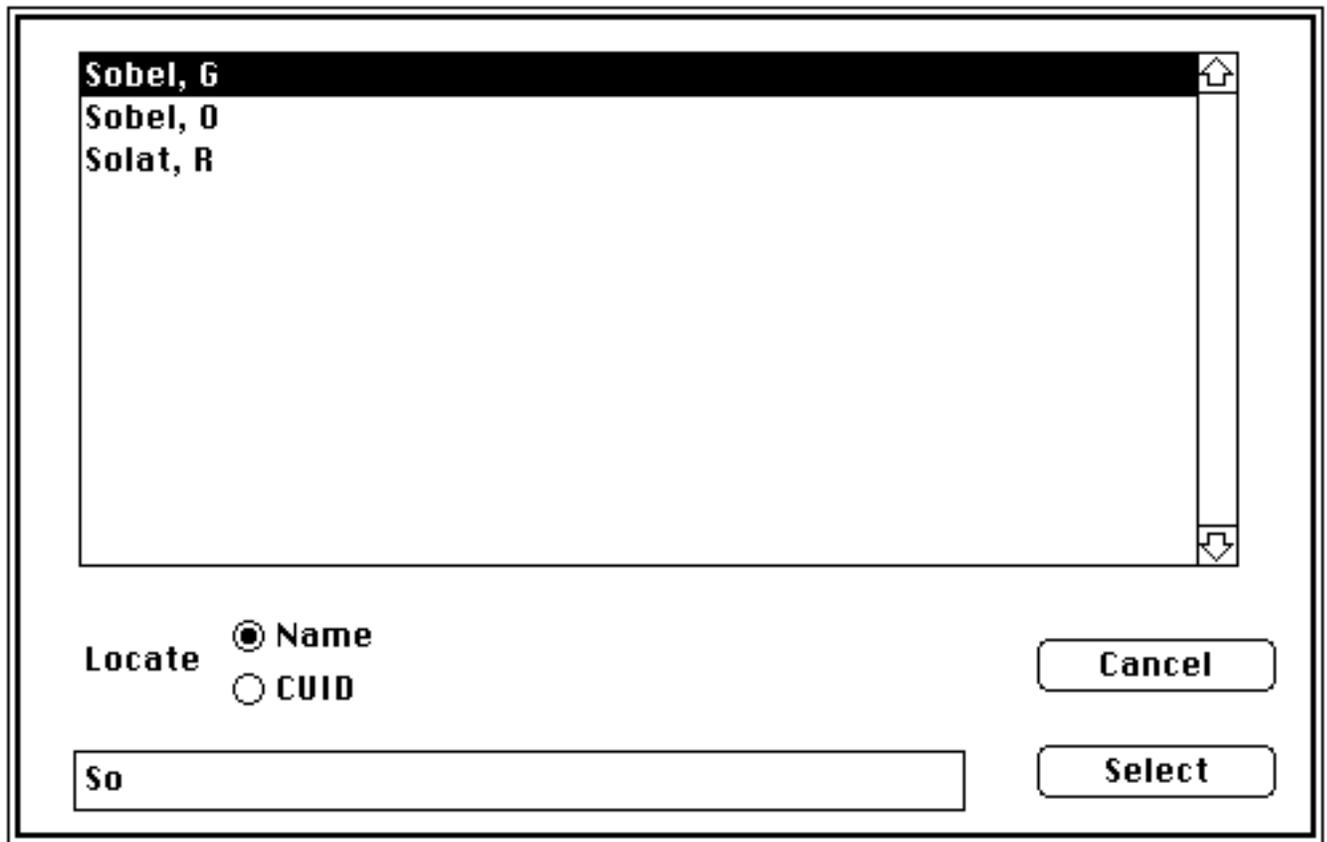


Fig 4.28b Narrowed list of names

Note: If you type enough characters to uniquely locate a record, MacRegistrar bypasses the above screen.

Alternatively, you can click on **Sobel, O** and then on **Select**.

#### 4.34 Previous

Display the immediately previous record.

#### 4.35 Next

Display the immediately following record.

#### 4.36 First

Display the first record in the file.

#### 4.37 Last

Display the last record in the file.

#### 4.38 Archives...

MacRegistrar saves in a separate list for manual review and disposition all deleted records and all imported records (Sec. 4.7) for which it cannot find an exact match.

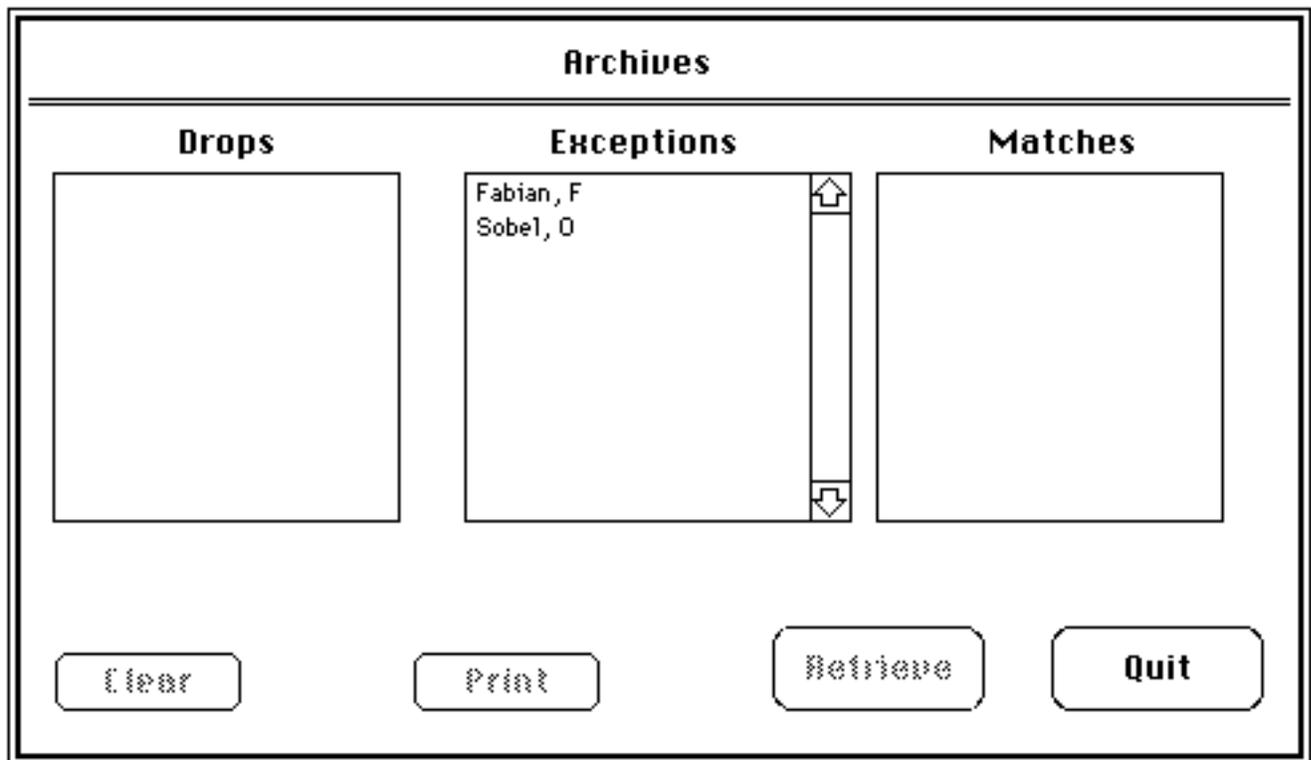


Fig 4.29 Archives window

Using the **Archives...** command, you can recover deleted records for review. Similarly, when you update your class list using files supplied by the Registrar or when you import scores from a text file created by a word processor or by a machine scoring device, MacRegistrar forms an archive file of problem cases.

During a **Create/Append** operation duplicate names are counted in **Matches** (Fig 4.12) and listed here (Fig 4.29). During a **Drop/Add** operation names in the course file which are *not* in the update file will be listed as **Drops**. During an **Import Grades** operation names in the import file which are not found in the course file data base are counted as **Exceptions** and are listed in the Archives (Fig 4.29). Any of these records can be printed, retrieved or permanently deleted using **Archives...** of the **Record** menu. If both names and CUIDs are included in the course file and in the import file, records are matched by CUID and the first three letters of the last name. If CUIDs are not included, only names are used to establish the correspondence of records. You can retrieve, modify, or permanently purge exception file records.

# Scores Menu



Fig 4.30 Scores menu

## 4.39 New Item

To add new items (grade fields) at the end of any column of a particular student record, select the last field in a column and then use **New Item** of the **Scores** menu (Fig 4.30). The new item remains undefined (and, therefore, shaded) until you assign a value directly or import one. See **New Global Items...** below.

## 4.40 Delete Item

You can select a field at the bottom of a column for a particular student record and then delete it using the **Delete Item** command from this menu. See **Delete Global Items...** below.

## 4.41 New Global Items

You can select a field at the bottom of a column and then add the corresponding field on **all existing** records in the course file. This field will not be defined automatically for any subsequently created records.

## 4.42 Delete Global Items

You can select a field at the bottom of a column and then remove it *and* the corresponding field on all records in the course file.

## 4.43 Drop Lowest...

The **Drop Lowest...** option permits you to drop a specified number of the lowest grades in each category when the program computes the weighted average.

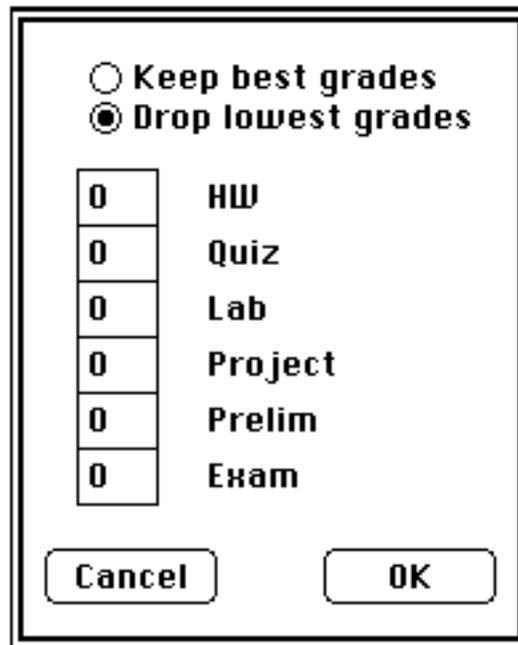


Fig 4.31 Drop lowest score window

Alternatively, if you allow extra graded items, you can include only a specified number of the best entries in each column using the **Keep Best...** option. Not all student records are required to have the same fields defined; use **Show Template...** of the **Scores** menu to identify the fields which have been defined on at least one record in the course.

#### 4.44 Letter Grades...

When you reformat a field from a numerical grade to letter grade, MacRegistrar makes an automatic translation according to ranges established using the following table. This translation table (Fig 4.32) is also used in calculating the weighted average when *letter* grades have been recorded.

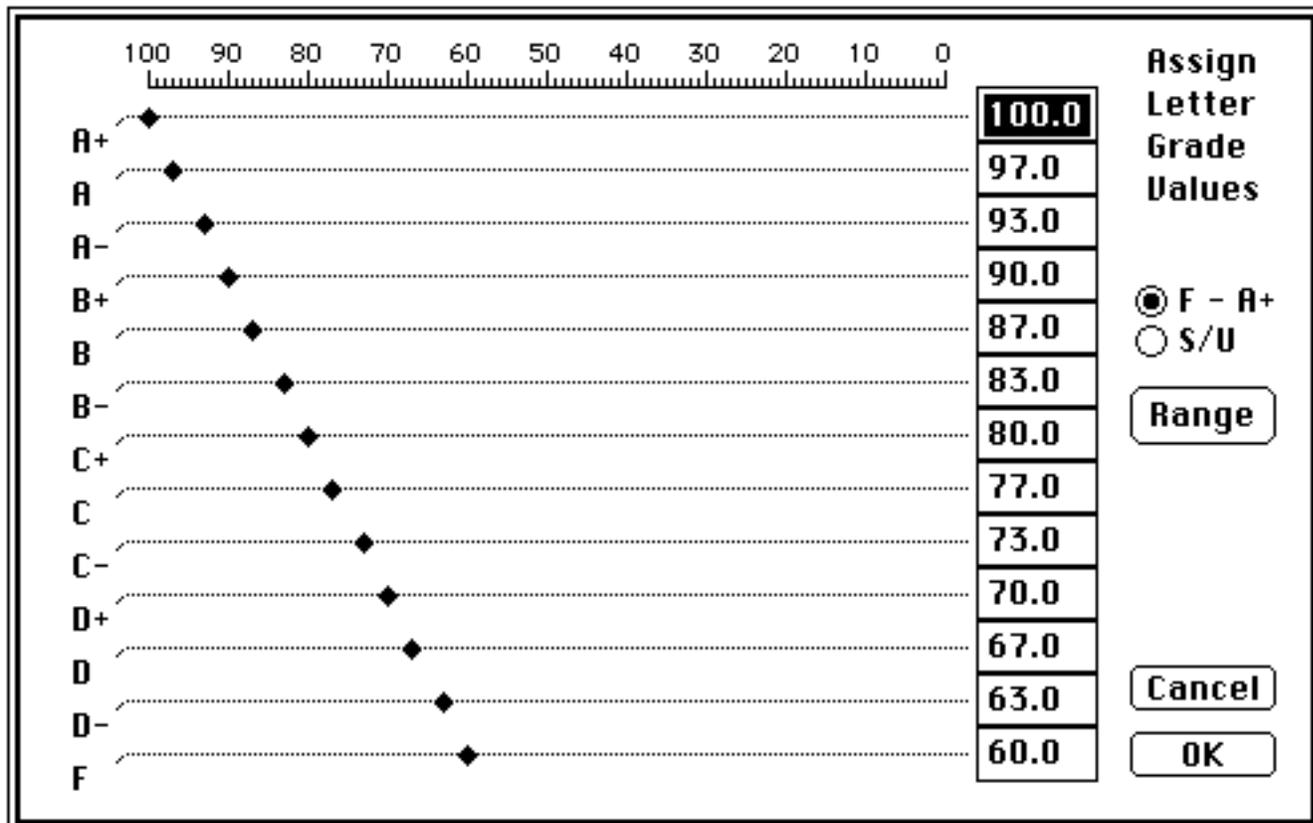


Fig 4.32 Letter grade transformation

Note: The upper limit of the grade range is used in a letter grade transformation, as suggested by the downward curvature of the range markers in Fig 4.32.

Note: If you use the 0 - 4.3 range (Fig 4.33) to transform letter grades into a numerical value for a weighted average calculation, don't forget to format the Final Grade field (Fig 4.37) to have the same range.

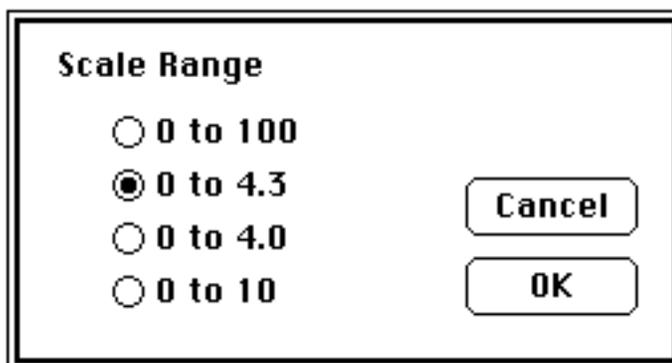


Fig 4.33 Letter grade translation range

The range of values can be set to one of several popular choices with the **Range** button. Select from the choices in Fig 4.33. Set the translation table by dragging the indicators on the grade division boundaries; finer adjustments can be made by editing the values in the table at the right.

#### 4.45 Show Template...

When calculating the weighted average (using **Calc. Average** under **Special**) you need to know how to handle missing grades. Because not every student record need have the same number of entries, you may need to identify which fields have been defined. Use **Show Template** to identify the defined fields.

Note: Defined records need not necessarily contain values. For example, the Lab and Paper categories contain no values; every column, however, must contain at least one defined field.

The screenshot shows a window titled "Intro To Agr Engr" with a menu bar including "File", "Edit", "View", "Record", "Scores", "Special", and "Windows". The "Scores" menu is active. Below the menu bar is a form with the following fields:

Name: \_\_\_\_\_ CUID: \_\_\_\_\_ SSN: \_\_\_\_\_ TA: \_\_\_\_\_  
 IntID: \_\_\_\_\_ Cl: \_\_\_\_\_ Col: \_\_\_\_\_ Lec: \_\_\_\_\_ Lab: \_\_\_\_\_ Sec: \_\_\_\_\_ Credit: \_\_\_\_\_ GrOpt: \_\_\_\_\_

Below the form is a table with the following columns: No., HW, Quiz, Lab, Paper, Prelim, Exam, Calc, and Average. The table has 14 rows. The "Average" column contains the text "Grade" and "Students 86". An arrow points to the "Quiz" column in row 6, with the label "defined fields". An "OK" button is located at the bottom right of the window.

Fig 4.34 Template of defined fields

#### 4.46 Format...

You can set the format for individually selected fields or for entire columns but you must select a field before MacRegistrar can enable this option. You can use either integer or real numbers with one decimal place; letter grades can be either A+, A, A-, B+, ...F or S/U or any two characters.

Select Format for  Quiz 5  
 Entire Quiz column

Number  Integer (###)  to   
 Decimal (###.#)

Letter  # - F  
 S/U  1 Point Value

Fig 4.35 Format of a grade field

If you attempt to reformat a field having existing data, MacRegistrar will warn you and then transform the data (See 4.42).

 **There is data stored in this field.  
Changing format will erase the data!!**

**Attempt to convert data from old format to new format**

**Change to new format and erase data**

**Make no format changes**

Fig 4.36 Data conversion warning

#### 4.47 Average Format...

The computed Average field can be either integer or decimal.

**Select Format For Average**

Integer (xxx)
  to

Decimal (xxx.x)

Fig 4.37 Format course average field

#### 4.48 Grade Format...

The final course Grade also has a reserved field which you must format. The grade can be either a numerical grade, a letter grade, or an S/U. You can edit the Grade you calculate using the **Special** menu.

If “E” appears in the **GrOpt** field in the student information section of the screen and you have selected Letter grades, MacRegistrar uses the S/U option for that record, overriding the general designation. Likewise if “L” appears in that field, a letter grade overrides the general choice. See the customization section in the Appendix.

**Select Final Grade Format...**

Number
  Integer (xxx)
  to

Letter
  Decimal (xxx.x)

A - F
  S/U

Fig 4.38 Format final course grade

# Special Menu



Fig 4.39 Special menu

## 4.49 Sort...

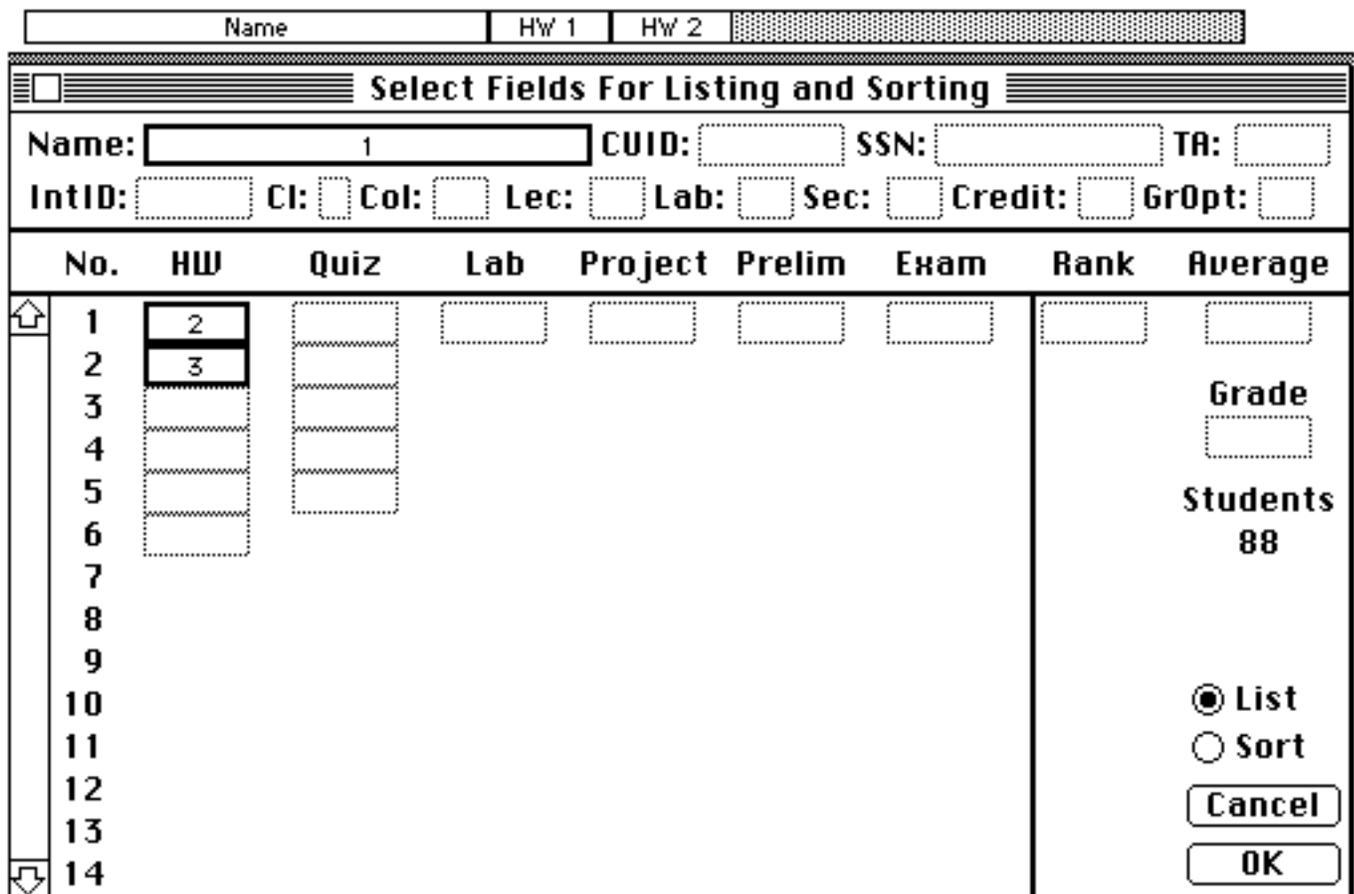


Fig 4.40 Select fields for listing and sorting

With **List** selected, specify the left-to-right ordering of the data columns by clicking. The ordering is posted within each field selected. To exchange the order of any two selected fields, use the mouse to drag one numbered field to coincide with another. To delete a previously selected field click on it again. You can click in the boxes on the top row of Fig 4.40 to change heading names, and, if sorting by one of these fields, to choose the sort categories.

Clicking in a heading or option-clicking in a selected field allows you to change headings or divide a sorted list into categories.

After you have selected the fields, click on **Sort** and then specify one or two fields in which you want to sort the records. You might click on **TA** and then on **Student** to produce an alphabetical class list for each TA.

#### 4.50 Rank...

**Compute rank for HW 2 into Rank 1**

Name: 
CUID: 
SSN: 
TA:

IntID: 
Cl: 
Col: 
Lec: 
Lab: 
Sec: 
Credit: 
GrOpt:

No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average
1	<input type="text"/>							
2	<input type="text"/>							
3	<input type="text"/>	<b>Grade</b>						
4	<input type="text"/>							
5	<input type="text"/>	<b>Students</b>						
6	<input type="text"/>	<b>88</b>						
7	<input type="text"/>							
8	<input type="text"/>							
9	<input type="text"/>							
10	<input type="text"/>							
11	<input type="text"/>							
12	<input type="text"/>							
13	<input type="text"/>							
14	<input type="text"/>							

Fig 4.41 Select input and output fields for ranking

Click on a grade field to identify the data you want to use in the rank. If more than one Rank or Calc. field exists (See 4.38), you must also select the field to receive the calculated value.

#### 4.51 Weights...

You need a formula for combining the individual scores if you are to produce a single score for the course. We have implemented three popular approaches; however, you are not limited to these. You can export the data to another application (e.g., spreadsheet, database, statistical, or graphical) or to a program you have written.

The most popular approach to this calculation is the *weighted average method* where MacRegistrar internally converts each test item within a column to a decimal number (using the point range you set for each entry when you formatted the field). Then MacRegistrar weights the items within columns equally to obtain column averages. MacRegistrar then weights the column averages to obtain a composite average. For example, 10% of the grade might be attributed to the average of the homework scores, 20% for the average of the quizzes, 40% for a term project, and 30% for the comprehensive final exam.

$$Wt\_Ave = \sum_{j=1}^M \left[ \sum_{i=1}^{N_j} \frac{Score_{ij}}{Max\_Pts_{ij}} \right] \cdot wt\%_j$$

All the Greek sigma symbols should be highlighted; if they are not, click them now.

Click one of the arrows at the top left of the screen to initialize the weight assignments; then drag the small circular dots to allocate the weights. These weights always total 100%.

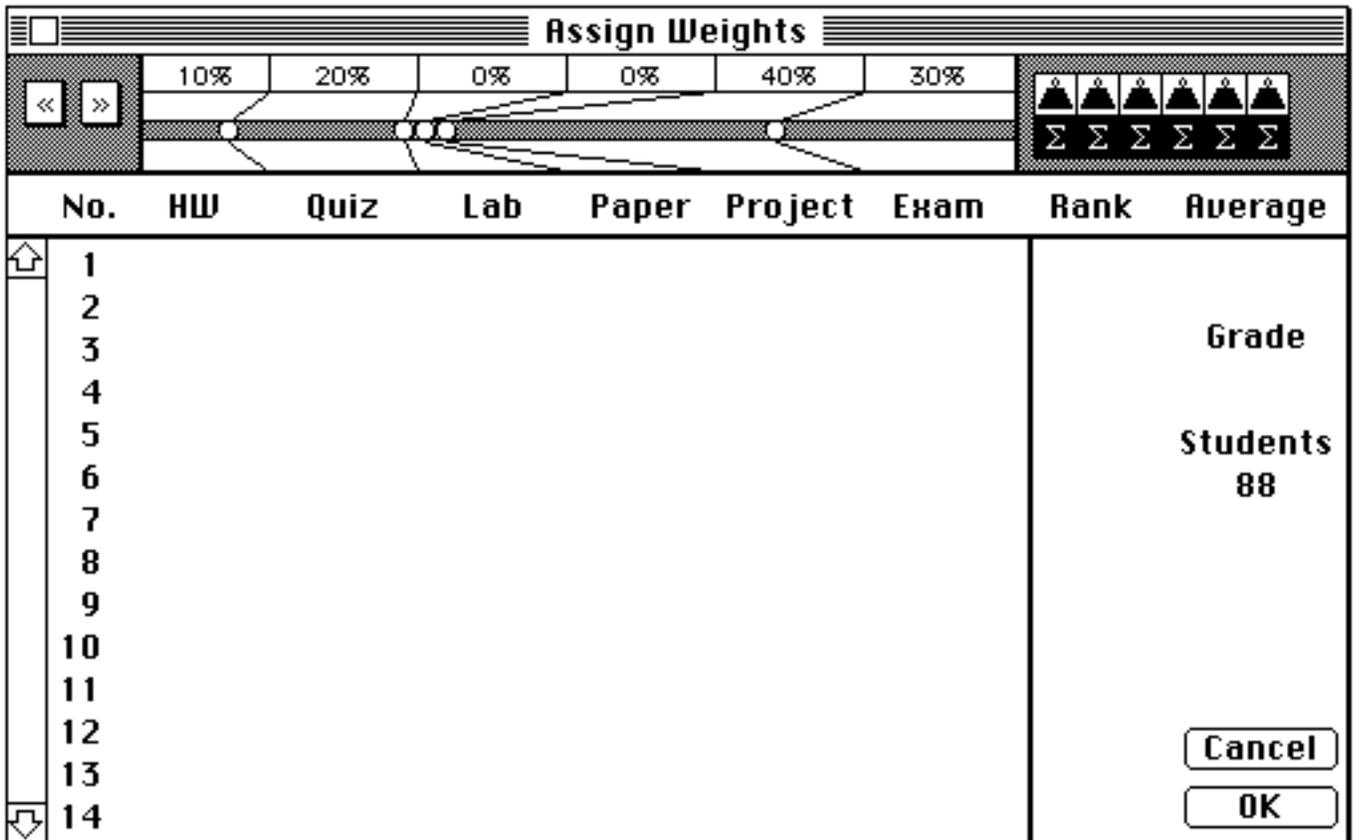


Fig 4.42 Assign column weights for average calculation

Another variation on this method is to base each item within a column on a different point total. Click the weight symbols just above the Greek sigmas (Fig 4.43), and then you can enter integer weighting values for each entry. You need only assign numbers which preserve the correct weighting ratios among the items within each column.

In Fig 4.43 the score is based solely upon six papers; the final three papers count twice as much as the first three.

No.	HW	Quiz	Lab	Paper	Prelim	Exam	Calc	Average
1				1				
2				1				
3				1				Grade
4				2				
5				2				Students
6				2				2

Fig 4.43 Unequal points for each field

#### 4.52 Calc. Ave...

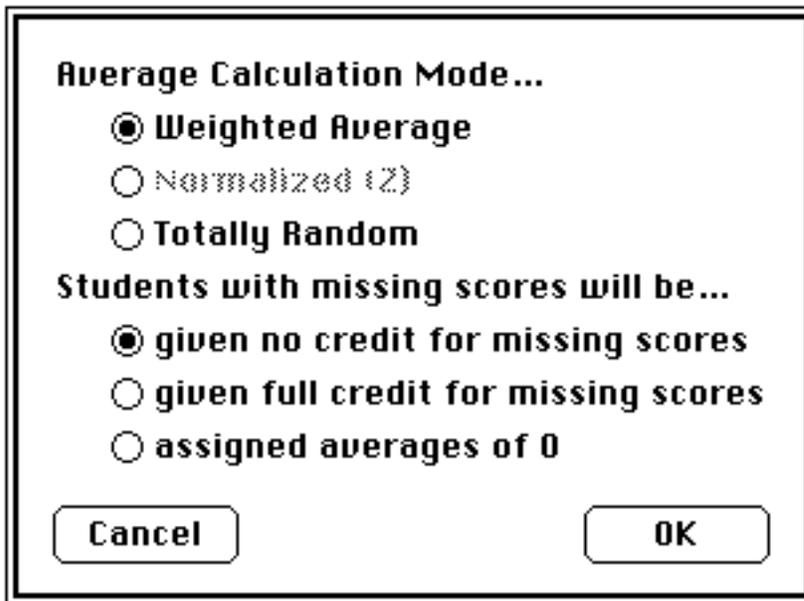


Fig 4.44 Select weighting scheme

MacRegistrar provides two popular schemes for computing a composite term score: weighted average and the normalized Z scores.

**Weighted Average:** The weighted average method handles both schemes for finding a column average described in the previous section: equal and unequal weights.

equal weights:

$$Wt\_Ave = \sum_{j=1}^M \left[ \begin{array}{c} N_j \\ wt\%_j \\ \frac{Score_{ij}}{Max\_Pts_{ij}} \end{array} \middle| N_j \right]$$

unequal weights:

$$Wt\_Ave = \sum_{j=1}^M \left[ \begin{array}{c} N_j \\ wt\%_j \\ \frac{(Item\_Wt_{ij}) \times Score_{ij}}{Max\_Pts_{ij}} \end{array} \middle| \begin{array}{c} N_j \\ (Item\_Wt_{ij}) \end{array} \right]$$

The average calculations depend upon the existence of complete student records in the course file (See 4.48.). Three options for dealing with incomplete records are available.

Numerical examples:

If the course grade is based solely upon six papers having grades of 70, 75, 80, 85, 90, and 95 and all scores were weighted equally, the weighted average is 82.5.

If the last score of 95 is missing and you use the option **give no credit for missing score**, the 95 becomes a 0 and the average is 66.7. If you use the option **give full credit for missing score**, the average is based on the remaining five scores and the average of 80.0. If you use the option **assign averages of 0** the average is 0, making such records easily located for review using the **Sort...** command..

Suppose all six scores are present and weighted unequally, as indicated in Fig 4.43. Then  $w_{t\_ave} = 1.00 * [1 * 70 + 1 * 75 + 1 * 80 + 2 * 85 + 2 * 90 + 2 * 95] / [1 + 1 + 1 + 2 + 2 + 2] = 85.0$ .

**Normalized Scores:** The normalized method, available only if all scores within a column are weighted equally, takes the class distribution of scores into account. You can activate this option only if you have selected *all six* of the weight symbols above the capital sigmas in the weights window.

The normalized score is defined as follows:

$$\text{normalized score} = Z = \frac{\text{student\_score\_sum} - \text{mean\_student\_sum}}{\text{std\_dev\_student\_sum}} \quad \frac{x - \mu}{s}$$

where

$$\text{mean\_student\_sum} = \left[ \begin{array}{cc} \# \text{ students} & \# \text{ scores per student} \\ m=1 & n=1 \end{array} \middle| \begin{array}{c} \text{score}_{nm} \\ \end{array} \right] / (\# \text{ students})$$

and

$$\text{std\_dev\_student\_sum} = \sqrt{\frac{\left| \begin{array}{c} \# \text{ scores per student} \\ n=1 \end{array} \right| \text{score}_{nm} - \text{mean\_student\_score} \right|^2}{(\# \text{ students} - 1)}}$$



The assignment process begins with a list of names, weighted averages, and an initial grade assignment arranged in a list according to weighted average. The initial assignments can be either \*, as above, distributed uniformly, or based upon the **Letter Grades...** assignment (§4.43). Use the reset icons to choose the starting configuration.

Simply drag the category separation lines to adjust membership in each range (Fig 4.45). MacRegistrar immediately upgrades the new grade on the screen. Adjust these lines as often as needed to achieve the desired assignments. You can change the actual ordering of names simply by dragging a name to a new position in the list.

The number of grades in each category, the cumulative number having one particular grade or a higher grade, and the numerical range corresponding to one particular grade appear at the right.

Name	Ave.	Grade	n	%	Σ%	range
Petersen, N	87.2	A+	6	6.8	6.8	84.4-100.0
Pitt, M	87.0	A+	7	8.0	14.8	80.3-82.7
Wishart, O	86.7	A+	8	9.1	23.9	76.9-79.9
Sailus, N	85.6	A+	7	8.0	31.8	75.6-76.5
Hollenbeck, C	85.1	A+	7	8.0	39.8	73.3-74.6
Cook, H	84.4	A+	8	9.1	48.9	70.4-73.0
-----						
Kelchner, S	82.7	A	7	8.0	56.8	69.3-70.4
Pellerin, W	82.1	A	7	8.0	64.8	67.1-68.5
Rehkugler, A	82.0	A	8	9.1	73.9	65.7-66.9
Sobel, O	81.4	A	7	8.0	81.8	63.3-65.2
Irish, S	81.1	A	7	8.0	89.8	61.1-63.1
Aneshansley, I	80.6	A	9	10.2	100.0	55.1-60.8
Reniff, B	80.3	A	0	0.0	100.0	
-----						
Jones, F	79.9	A-	0	0.0	100.0	
Gebremedhin, K	79.5	A-				
White, B	79.0	A-				
Becker, T	78.5	A-				
Martin, W	78.5	A-				
Stanton, H	77.7	A-				
Price, K	77.1	A-				

Fig 4.46 Visually reassign grades

Scroll the list as needed using the scroll bar; automatic scrolling occurs when you drag a name or category separator past the end of the visible range. MacRegistrar automatically assigns the Grades to the student records when you click **OK**.

File Edit View Record Scores **Special** Windows

Name	Ave.	Grade	n	%	Σ%	range
Petersen, N	87.2	A+	6	6.8	6.8	84.4-100.0
Pitt, M	87.0	A+	7	8.0	14.8	80.3-82.7
Wishart, O	86.7	A+	8	9.1	23.9	76.9-79.9
Sailus, N	85.6	A+	7	8.0	31.8	75.6-76.5
Hollenbeck, C	85.1	A+	7	8.0	39.8	73.3-74.6
Cook, H	84.4	A+	8	9.1	48.9	70.4-73.0
Kelchner, S	82.7	A	7	8.0	56.8	69.3-70.4
Pellerin, W	82.1	A	7	8.0	64.8	67.1-68.5
Rehkugler, A	82.0	A	8	9.1	73.9	65.7-66.9
Sobel, O	81.4	A	7	8.0	81.8	63.3-65.2
Irish, S	81.1	A	7	8.0	89.8	61.1-63.1
Aneshansley, I	80.6	A	9	10.2	100.0	55.1-60.8
Reniff, B	80.3	A	0	0.0	100.0	
Jones, F	79.9	A-	0	0.0	100.0	
Gebremedhin, K	79.5	A-				
White, B	79.0	A-				
Becker, T	78.5	A-				
Martin, W	78.5	A-				
Stanton, H	77.7	A-				
Price, K	77.1	A-				

Reset Cancel OK

Fig 4.47 Uniform initial distribution of grades

If you wish to review a student's full record at any time during the grade assignment process, simply *double-click* on the student's name and the record appears.

Intro to Agr Engr									
Name: Jones, F			CUID: 297512		SSN:		TA: CM		
IntID: 11958		Cl: 1	Col: 2	Lec:	Lab:	Sec: 2	Credit: 2	GrOpt:	
No.	HW	Quiz	Lab	Paper	Prelim	Exam	Rank	Average	
1	52	61	████████	████████	81	92	3	79.9	
2	96	9.1						Grade	
3	94	23.0						A	
4	57	25						Students	
5	59							88	
6	54								
7									
8									
9									
10									
11									
12									
13									
14									

Fig 4.48 Full record lookup

During the grade assignment process you still have access to the full text record of a student normally found using the **About Student...** command on the  menu. *Option double-click* on the name to retrieve the student's full record.

#### 4.54 Create Graph...

Descriptive statistics (mean and standard deviation) and histograms provide an overall view of the distribution of scores. These characterizations are immediately available from MacRegistrar.

To create a histogram, click to designate up to six score fields having the *same* format you wish to examine and then choose **Create Graph...** from the **Special** menu. MacRegistrar can also construct histograms of scores separated by categories (TA, Cl, Col, Lec, Lab, or Sec).

From Fig 4.51 select the options which describe the plot you wish to create. Line drawings with mean and median are only available for letter grade fields. You can create a histogram for either numerical or letter grade fields. The range for the horizontal axis defaults to the range specified in the **Format...** command. However, you can specify a smaller range if you wish.

You can choose either stacked or side-by-side charts. Up to six comparisons can appear on one graph. Use the choose window (Fig 4.57) to select the categories you want to compare. A legend to identify the categories appears automatically on the graph.

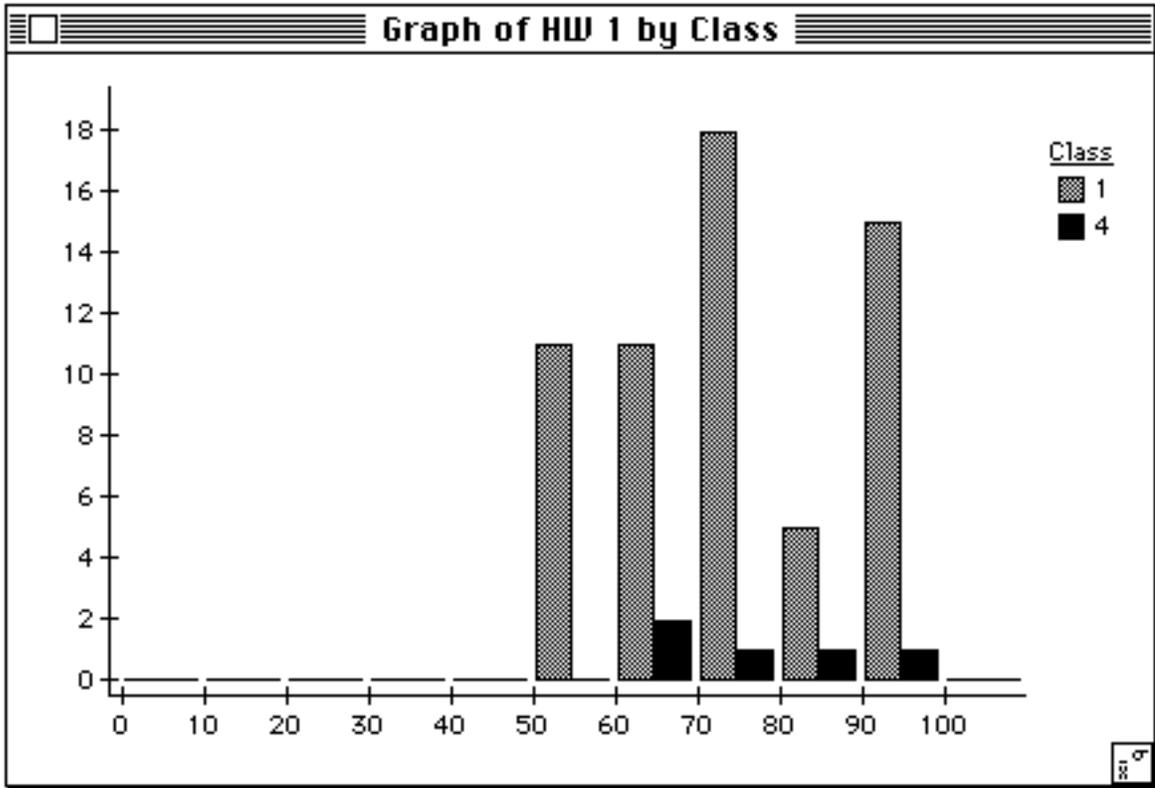


Fig 4.49 Histogram with two categories

Click on the icon at the bottom right corner of the graph to see the following descriptive statistics.

Graph of HW 1 by Class			
Range: 0 - 100			
Class	Mean	Median	Std. Dev.
1	74.6	72.0	14.7
4	76.0	71.0	12.2

Fig 4.50 Descriptive statistics

Click on the histogram icon to return to the graph or click on the close box to exit **Create Graph**.

#### 4.55 Graph Options...

You can access **Graph Options...** directly from the **Special** menu as well as from within the **Create Graph...** option..

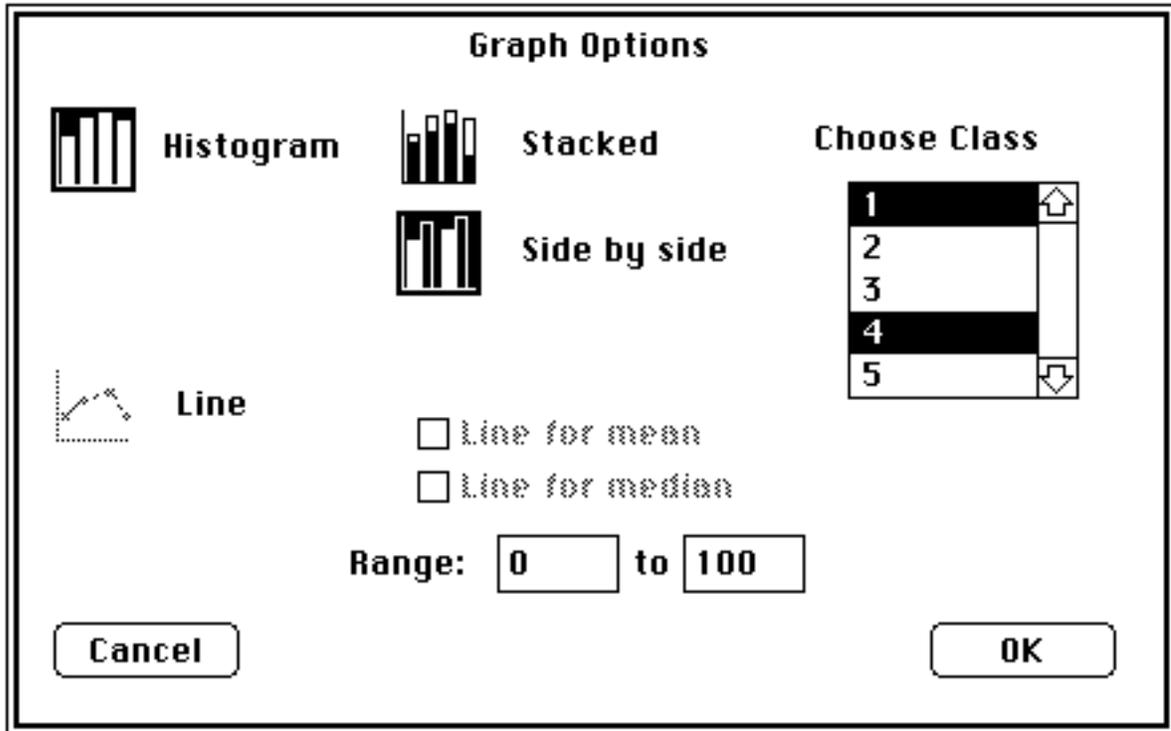


Fig 4.51 Graph options window

When multiple sets of data have been selected, a scroll selection window appears as part of this window. Use the Macintosh conventions of shift-clicking and option clicking to select a contiguous or a disconnected range.

#### 4.56 Assign Comment....

You can create up to five stock comments to annotate grade fields and tag up to five fields of each student record with any combination of these messages. Simply select a field you want to tag, access the **Assign Comment...** command from the **Special** menu, select the appropriate message, and click **OK**.

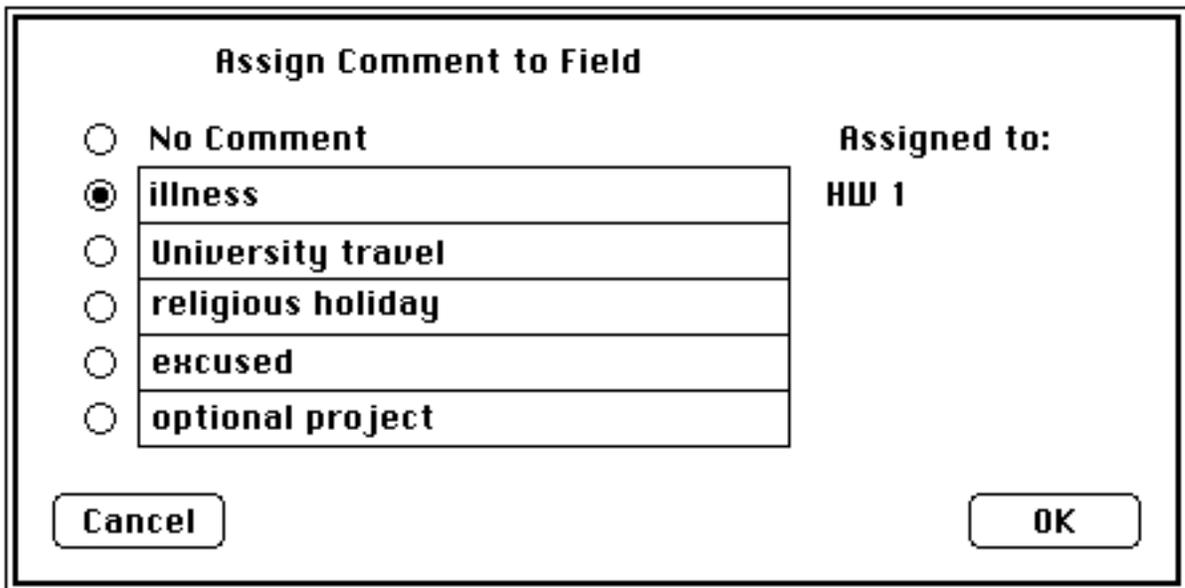


Fig 4.52 Assign comment window

To review the comments assigned for a student, retrieve the student record and select **Assign Comment...** to see a list such as above.

#### 4.57 Change Headings...

You can customize the column headings for your particular course. Select **Change Headings...** from the **Special** menu. You can modify all of the seven heading. Click **OK** to accept the list when editing is complete.

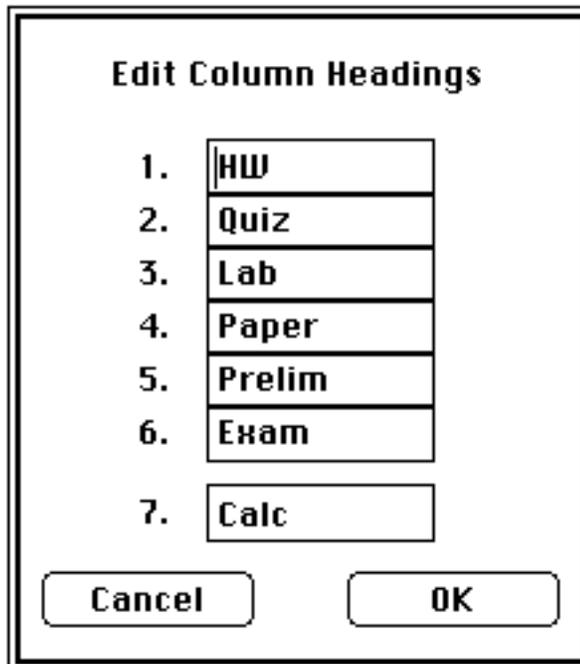
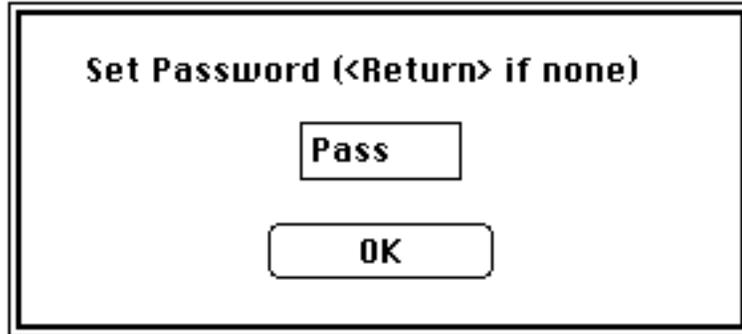


Fig 4.53 Change column headings

#### 4.58 Change Password...

You can change the password at anytime, provided of course you know the existing password and can open the file. The password provides a low level of security from casual snooping but is not sufficient to prevent a serious attempt to access your files. We recommend that you exercise the same level of security you would with paper copies, i.e., physical security. Incidentally, we recommend that you both duplicate disks for backup and print a summary after each major update.

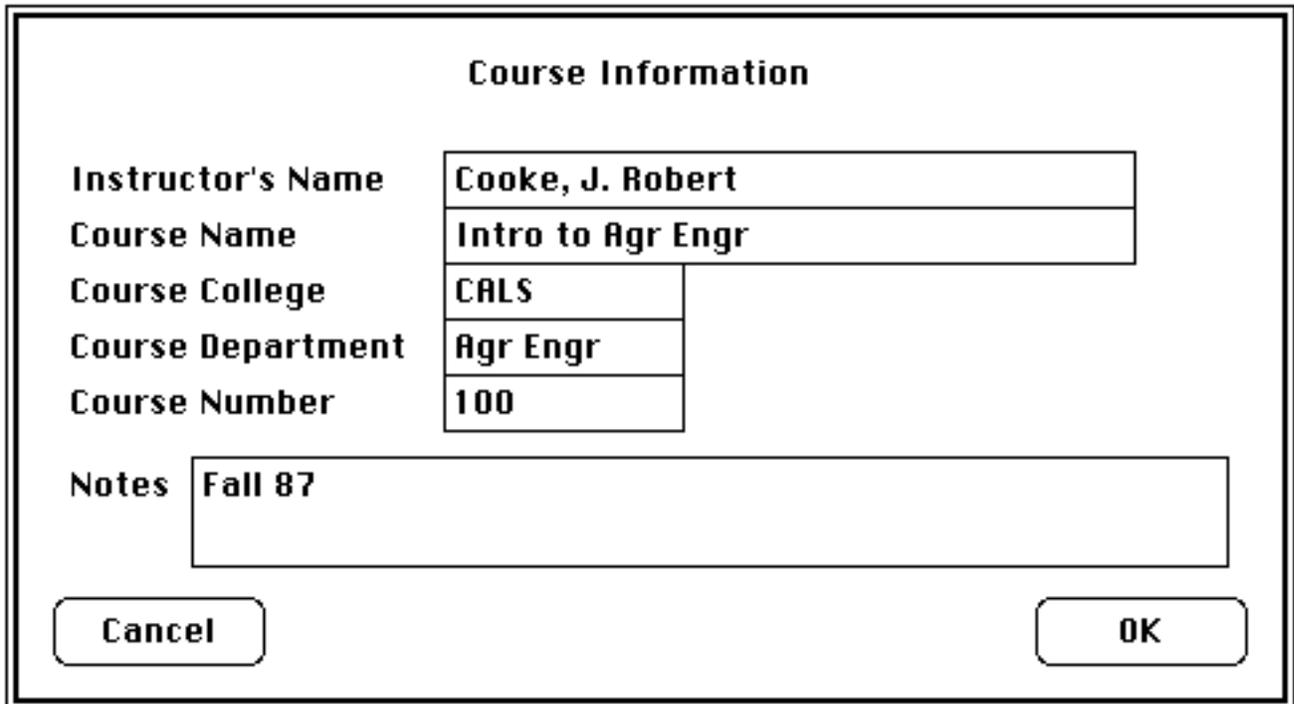


A dialog box titled "Set Password (<Return> if none)". It contains a text input field labeled "Pass" and an "OK" button below it.

Fig 4.54 Set password window

#### 4.59 Change Course Info...

Course information is stored here. If you intend to submit your end-of-term course grades in machine readable form, the Registrar field must match the expected course identification. Therefore, if you attempt to alter the information assigned to this field by the **Import From Registrar** (Fig 2.75) process, an alert reminds you of this requirement.



A dialog box titled "Course Information" with the following fields and values:

Instructor's Name	Cooke, J. Robert
Course Name	Intro to Agr Engr
Course College	CALS
Course Department	Agr Engr
Course Number	100
Notes	Fall 87

Buttons: Cancel, OK

Fig 4.55 Course information window

#### 4.60 Generate ID's...

Federal law prohibits the public disclosure of such student information as class lists without the student's consent. The student's identification or social security numbers might be used instead of the student's name. However, MacRegistrar provides an even more secure procedure—internal course identification numbers. MacRegistrar generates this course-specific number automatically. Without destroying the numbers created earlier, you can even generate unique IntId numbers for students joining the class after the term has begun.

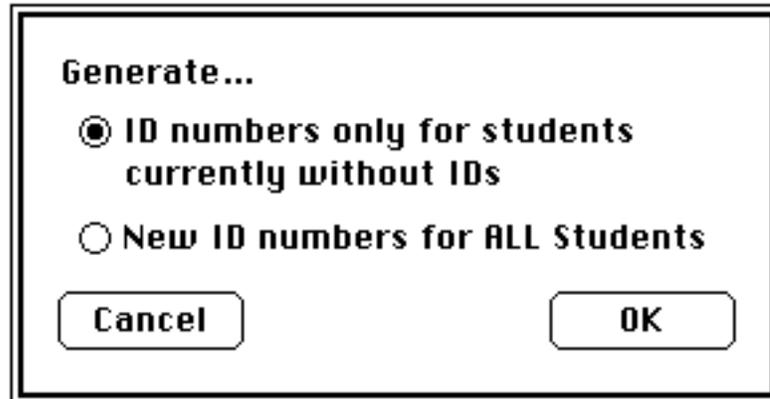


Fig 4.56 Internal identification number window

# Windows Menu

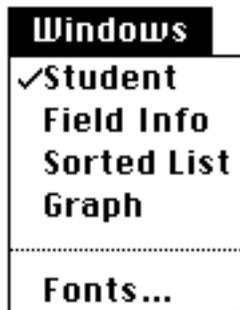


Fig 4.57 Windows menu

## 4.61 Student

The Student window contains the complete student record. Because additional windows exist (See 4.59-61), clicking the close box does not close a course file. You can make the student record window active or inactive by using the **Windows** menu or by clicking on other windows.

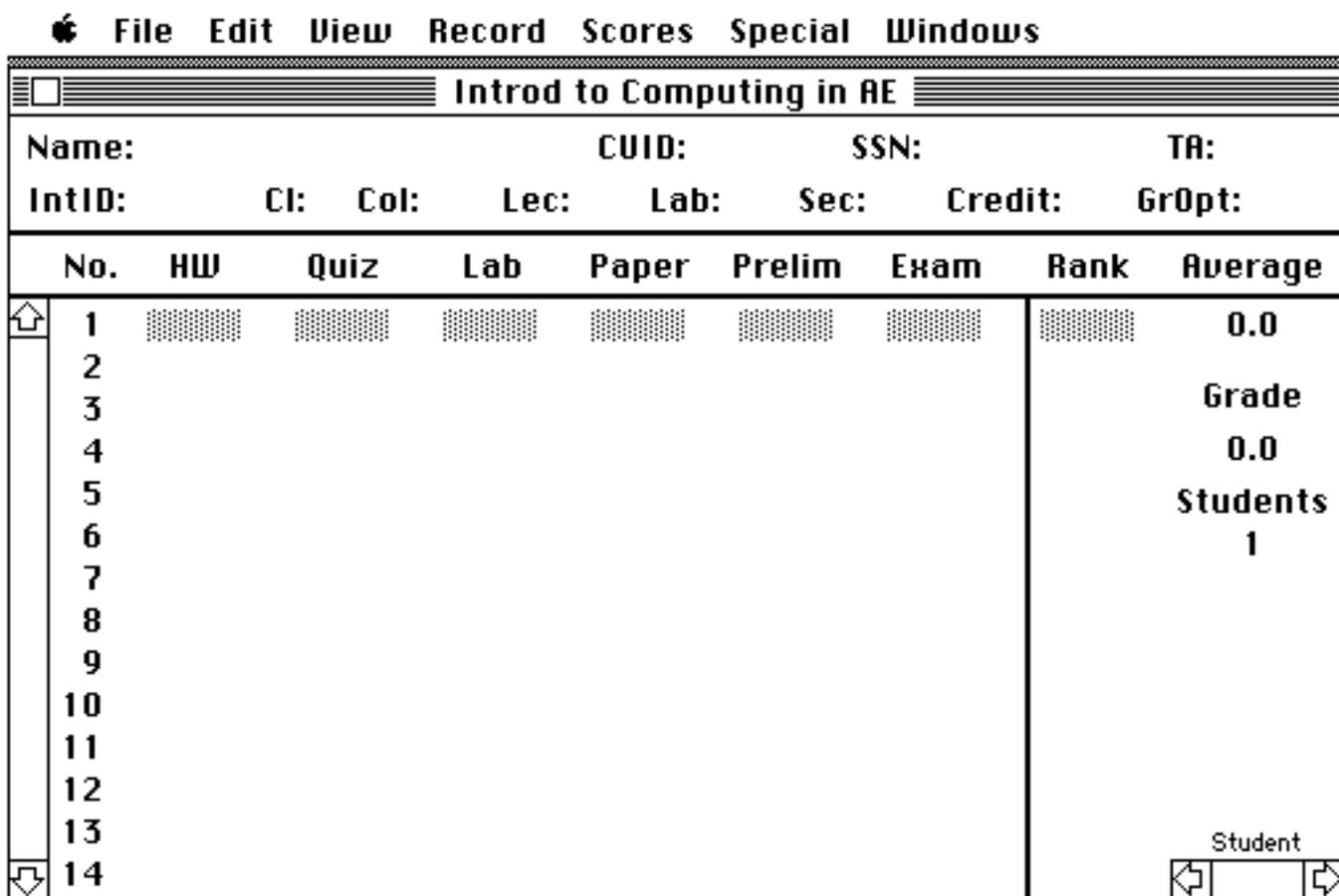


Fig 4.58 Student record window

#### 4.62 Field Info

You can describe the contents of each field using this window. A description of the material covered by the score is a customary use of this field. If you maintain attendance records in the database, you might use this field to associate the day of the month with each entry.

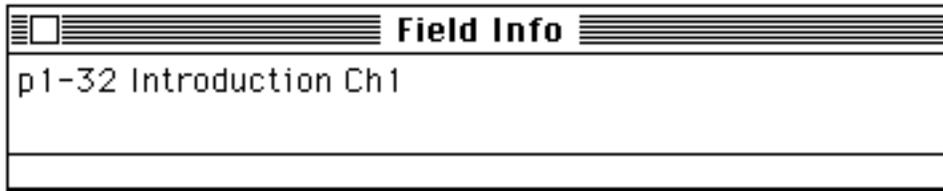
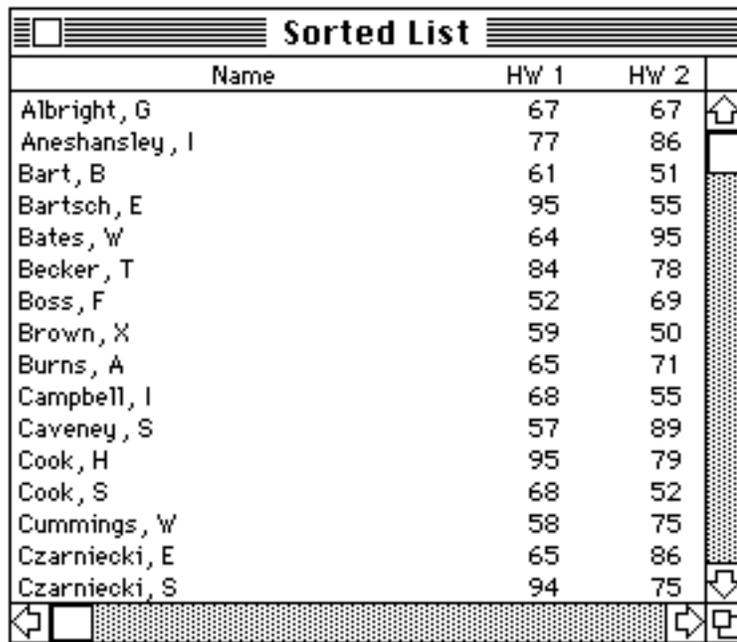


Fig 4.59 Field info window

#### 4.63 Sorted List

You can generate a sorted list using the **Sort...** of the **Special** menu. If another window subsequently becomes the active window, you can bring the sorted list to the foreground again with **Sorted List** command of the **Windows** menu. Clicking on any visible portion of the window has the same effect.

A screenshot of a window titled "Sorted List". The window contains a table with three columns: "Name", "Hw 1", and "Hw 2". The table lists 18 students with their names and corresponding homework scores. The window also features a vertical scrollbar on the right side and a status bar at the bottom with navigation icons.

Name	Hw 1	Hw 2
Albright, G	67	67
Aneshansley, I	77	86
Bart, B	61	51
Bartsch, E	95	55
Bates, W	64	95
Becker, T	84	78
Boss, F	52	69
Brown, X	59	50
Burns, A	65	71
Campbell, I	68	55
Caveney, S	57	89
Cook, H	95	79
Cook, S	68	52
Cummings, W	58	75
Czarniecki, E	65	86
Czarniecki, S	94	75

Fig 4.60 A sorted list window

#### 4.64 Graph

To generate a graph use **Create Graph...** of the **Special** menu. If another window subsequently becomes the active window, you can bring the graph to the foreground again with the **Graph** command of the **Windows** menu. Clicking on any visible portion of the window has the same effect. You can toggle between graph and descriptive statistics windows using the small icon at the bottom right corner of the window.

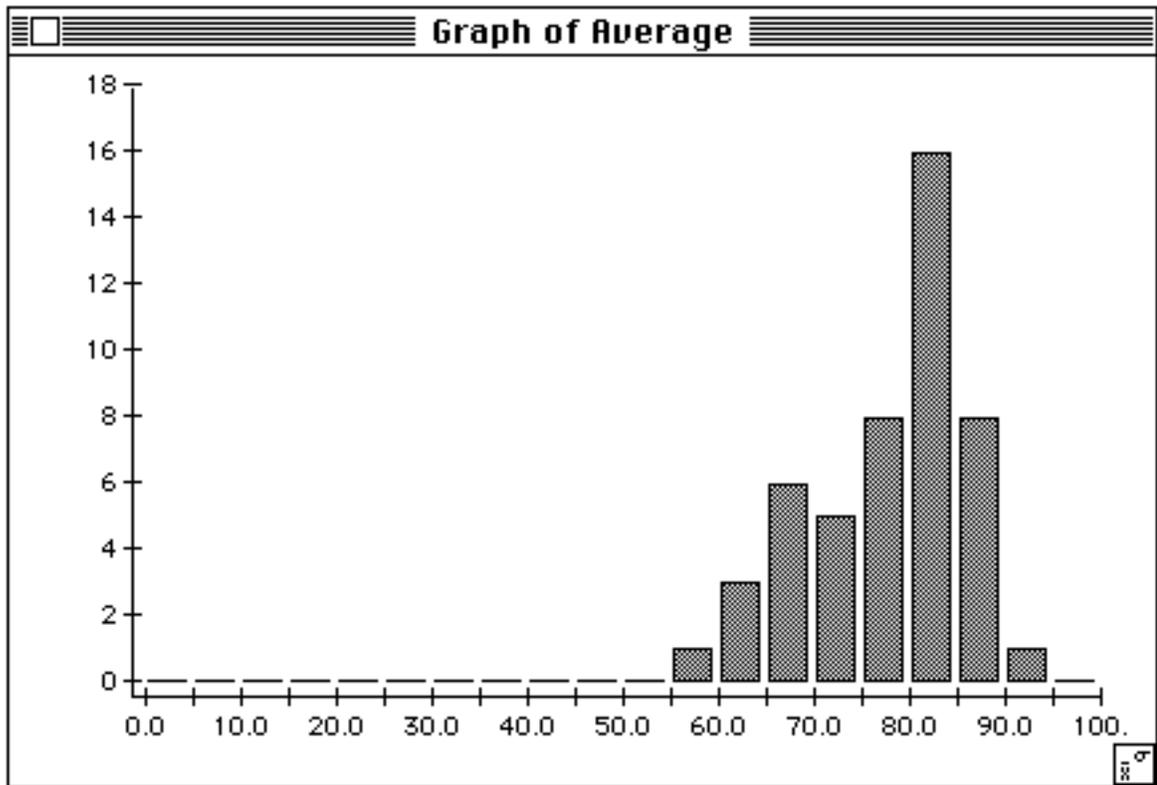


Fig 4.61 Graph window

#### 4.65 Fonts...

The entire collection of fonts and font sizes in the active system file are available for use with the text on the screen or in printed output for sorted lists. If you enter a font size not included in the scroll menu, the quality of screen and ImageWriter output suffers; LaserWriter output, however, is scaled correctly and is of higher quality.

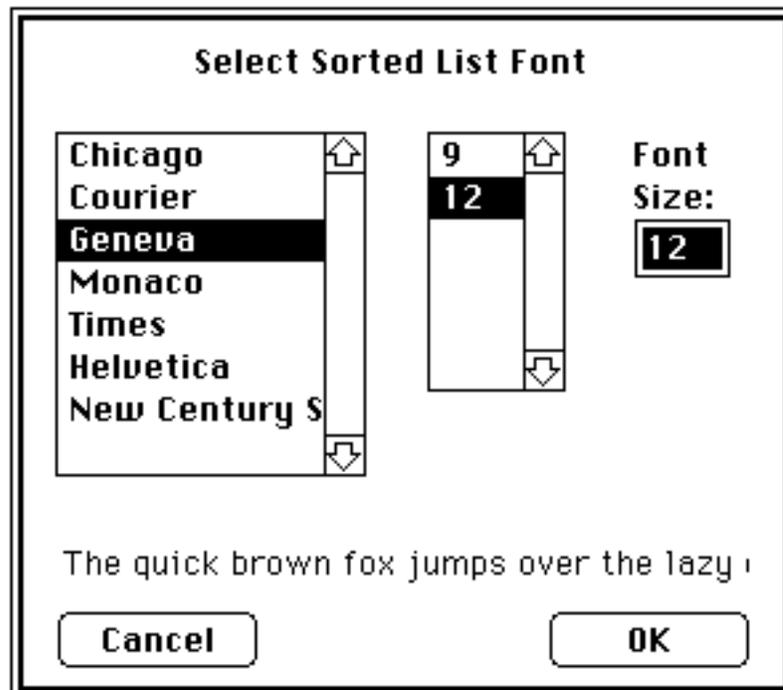


Fig 4.62 Fonts... window

# Appendix

## 5.1 Customization Guide

### A. Screen Appearance

You can make three adjustments to the appearance of the student record window.

#### 1. Location of text on the screen:

MR stores screen locations in 9 named resources of type 'SLoc'. This resource is made up of an integer that gives the vertical location of the start of the text and a list of integers that give the horizontal locations of each of the strings that MR draws on the screen.

Make adjustments as follows:

SLoc "HR1", ID 128

First row of the student information; pairs of integers are given. The first of each pair is the location of the field name, and the second is the location of the beginning of the editable portion of the field.

SLoc "HR2", ID 129

Second row of the student information in the same format as "HR1".

SLoc "Headings", ID 130

Nine items giving the location of the column headings, including column # and Average. The locations are the centers of the strings.

SLoc "First Row", ID = 131

One item giving the location of the centers of the first row of the score fields. The remaining rows are offset from this row.

SLoc "Grade", ID = 132

Center of the Grade field.

SLoc "Students", ID = 133

Center of the Students field.

SLoc "Lines1", "Lines2" and "DArrow"

Used for drawing lines and the Category Arrow.

## 2. Width of editable fields:

MR stores field widths (in pixels) in the resource type 'FWdt' ID# 128. An integer exists for each of the fields in the student information portion of the student record window (12). The 13<sup>th</sup> integer is the width of the score fields, including grade and average.

## 3. Field names:

MR stores field names as strings in the resource type 'STR#'. STR# 1000 is the default column headings. STR# 1001 contains the student information field names. MR also stores this information in STR# 128. The description of these fields is stored in STR# 2001. STR# 1002 contains the remaining strings on the screen.

## B. Keyboard Traps

You can control two things regarding keyboard entries:

### 1. Number of allowable characters:

FWdt # 129 contains a table of maximum character counts for each of the 12 fields in the student information portion of the student record window. The 13<sup>th</sup> integer is the character count for the score, average, and grade fields.

### 2. Type of input allowed:

FWdt \$ 130 contains a table of allowable inputs for each of the 12 fields in the student information portion of the student record window. MR assigns a character in the table with one of the following values to each field:

- A     Alphabetical; also includes ' ', ',', '-', and '!'.
- N     Numeric; '0' to '9' and '.'
- B     Both Alphabetical and Numeric

Any other value in the table other than these means that the field can contain any character.

## C. Grade Option Character Definition

FWdt # 131 contains a 3-character table of the symbols used to denote the grade options as follows:

- |        |                     |
|--------|---------------------|
| Char 0 | Letter Grade Option |
| Char 1 | S/U Grade Option    |
| Char 2 | Number Grade Option |

When one of these characters appears in the grade option field, then the grade for that student is forced to the format of the grade option.

## D. Term Dialog

DITL # 611 is the item list for the Term Dialog. The last  $n$  items in this list are the control items for the various terms used. You can configure this item list for as many radio buttons as you need, as long as they are in consecutive order and are the last items in the list. The strings that MR stores in the export file for each of the items are stored in STR# 611. Make sure that the number of radio buttons in the item list equals the number of strings in the string list.

## E. Letter Grades

STR# 129 contains the letter grade strings MR uses.

## F. Import/Export Fields

STR# 600 contains the names of the fields that appear in the menu bar when you are creating or editing an import or export format.

The allowable contents of these fields which MR checks during import are contained in the same table as Keyboard Traps.

## 5.2 Sample Calculations in Pascal

```
PROGRAM SumScores;
```

```
{This program is an example designed to demonstrate how one might use}
{the import/export capabilities of MacRegistrar to implement user-}
{defined calculations on scores. It will also demonstrate the use of}
{the import/export header as means of identifying the fields that are}
{contained in the export file.}
```

```
{Specifically, this program takes an arbitrary number of score fields}
{for each student, and adds them to form a sum column. The number of}
{score fields is determined from the export header. The exported}
{score fields are replaced with the field sums.}
```

```
USES
```

```
Memtypes, Quickdraw, OSIntf, ToolIntf, PackIntf, SANE;
```

```
{ Typical application initialization }
```

```
PROCEDURE Initialize;
```

```
{ Maximum application heap zone with a program-defined stack }
```

```
PROCEDURE SetUpMemory;
```

```
CONST
```

```
maxStackSize = 20000;
```

```
TYPE
```

```
MemPtr = ^longint;
```

```

VAR
    stackBasePtr : MemPtr;

BEGIN { SetUpMemory }
    stackBasePtr := MemPtr($908);
    SetApplLimit(pointer(stackBasePtr^ - maxStackSize));
    MaxApplZone
END; { SetUpMemory }

BEGIN
    SetUpMemory;
    InitGraf(@thePort);
    InitFonts;
    InitWindows;
    InitMenus;
    TEInit;
    InitDialogs(NIL)
END; { Initialize }

PROCEDURE Main;

VAR
    theTypeList      : SFTypeList;
    ImpDlgPt         : Point;
    ImportFile       : SFReply;
    FileError        : OSERR;
    IFRef,
    OFRef,
    NFields,
    FieldStart       : integer;
    logEOF,
    count            : longint;
    OutFile          : string[63];
    Header           : Handle;
    HeaderString     : CharsHandle;
    BadFormat,
    Delimited        : boolean;
    Delimiter        : char;

{ Convert an integer into a string }

FUNCTION IntStrOf ( i : integer ) : Str255;

VAR
    f : DecForm;
    s : DecStr;
    d : decimal;

BEGIN
    f.style := FixedDecimal;
    f.digits := 0;
    Num2Dec(f, i, d);
    Dec2Str(f, d, s);
    IntStrOf := s
END; { IntStrOf }

{ Convert a numeric string into an integer }

FUNCTION IntNumOf ( str : Str255 ) : integer;

```

```

VAR
    n : longint;
    NChars : integer;

BEGIN
    NChars := 1;
    WHILE (str[NChars] IN ['0'..'9']) AND (NChars < length(str)) DO
        NChars := NChars + 1;
    IF NChars < length(str) THEN
        NChars := NChars - 1
    ELSE IF str[NChars] = ' ' THEN
        NChars := NChars - 1;
    str := copy(str, 1, NChars);
    StringToNum(str, n);
    IntNumOf := LoWord(n)
END; { IntNumOf }

{ Return TRUE if at end of file }

FUNCTION EOF : boolean;

    VAR
        fPos : longint;

    BEGIN
        FileError := GetFPos(IFRef, fPos);
        EOF := fPos >= logEOF
    END; { EOF }

{ Return the next character in the file. The file mark is moved.}

FUNCTION NextChar : char;

    VAR
        c      : char;
        count  : longint;

    BEGIN
        count := 1;
        c := ' ';
        FileError := FSRead(IFRef, count, pointer(ord(@c) + 1));
        NextChar := c
    END; { NextChar }

{ Check the file for a format header at the beginning. If found }
{ then return a handle to it. }

FUNCTION IsHeader ( VAR Header      : Handle;
                   VAR BadFormat : boolean ) : boolean;

    VAR
        Switch : STRING[2];
        fPos   : longint;

    BEGIN
        IsHeader := false;
        BadFormat := false;
        FileError := SetFPos(IFRef, fsFromStart, 0);

```

```

count := 2;
Switch := '  ';
FileError := FSRead(IFRef, count, pointer(ord(@Switch) + 1));
IF Switch = '%%' THEN
  BEGIN
    WHILE (NextChar <> '%') AND NOT EOF DO
      ;
    IF NOT EOF THEN
      IF NextChar = '%' THEN
        BEGIN
          FileError := GetFPos(IFRef, fPos);
          Header := NewHandle(fPos);
          HLock(Header);
          FileError := SetFPos(IFRef, fsFromStart, 0);
          count := fPos;
          FileError := FSRead(IFRef, count, Header^);
          HUnlock(Header);
          FileError := SetFPos(IFRef, fsFromStart, fPos + 1);
          IsHeader := true
        END
      ELSE
        BadFormat := true
      ELSE
        BadFormat := true
      END { if }
    ELSE
      FileError := SetFPos(IFRef, fsFromStart, 0);
      IF BadFormat THEN { Bad format header. Probably missing %%. }
        SysBeep(6)
    END; { IsHeader }

    { Return an integer equivalent to the two-character string stored }
    { at 'StartingIndex' in the header handle. }

    FUNCTION ExtractInteger ( StartingIndex : integer ) : integer;

    BEGIN
      ExtractInteger := 10 * ( ord(HeaderString^[StartingIndex]) -
        $30 ) + ord(HeaderString^[StartingIndex + 1]) - $30
    END; { ExtractInteger }

    { This procedure reads the input file for a list of names and }
    { scores, and puts the names and the sum of the scores in the }
    { output file. }

```

```
PROCEDURE DoAdd;
```

```

VAR
  FieldIndex,
  FieldCount,
  FieldLength,
  Sum,
  Code          : integer;
  aField       : Str255;
  dummy        : char;

```

```

{ Read the next field from the file. }

FUNCTION ExtractField : Str255;

VAR
    str      : Str255;
    l        : integer;
    c        : char;
    count    : longint;

BEGIN
    IF Delimited THEN
        BEGIN
            l := 0;
            { Read characters one at a time until a delimiter, end
              {of line, or end of file. }

            REPEAT
                c := NextChar;
                IF (c <> Delimiter) AND (c <> chr(13)) THEN
                    BEGIN
                        l := l + 1;
                        BlockMove(pointer(ord(@c) + 1), pointer(ord(@str)
                            + l), 1)
                    END
                UNTIL (c = Delimiter) OR (c = chr(13)) OR EOF;
                BlockMove(pointer(ord(@l) + 1), @str, 1)
            END
        ELSE
            BEGIN
                { Read the # of characters specified in the format. }
                FieldLength := ExtractInteger(FieldIndex);
                FieldIndex := FieldIndex + 2;
                BlockMove(pointer(ord(@FieldLength) + 1), @str, 1);
                count := FieldLength;
                FileError := FSRead(IFRef, count, pointer(ord(@str) + 1))
            END;
            ExtractField := str
        END; { ExtractField }

        { Write a character to the output file }
        PROCEDURE WriteChar ( aChar : char );

        VAR
            count : longint;

        BEGIN
            count := 1;
            FileError := FSWrite(OFRef, count, pointer(ord(@aChar) + 1))
        END; { WriteChar }

        { Write a string to the output file }

        PROCEDURE WriteField ( field : Str255 );

        CONST
            spaces = '          ';

        VAR
            count : longint;

```

```

BEGIN
  IF Delimited THEN
    BEGIN
      count := length(field);
      FileError := FSWrite(OFRef, count, pointer(ord(@field) +
        1));
      IF FieldCount < NFields THEN WriteChar(Delimiter)
    END
  ELSE
    BEGIN
      IF length(field) < FieldLength THEN
        field := concat(field, copy(spaces, 1, FieldLength -
          length(field)))
      ELSE IF length(field) > FieldLength THEN
        field := copy(field, 1, FieldLength);
        count := FieldLength;
        FileError := FSWrite(OFRef, count, pointer(ord(@field) + 1));
      END
    END; { WriteField }

BEGIN { DoAdd }
FieldIndex := FieldStart;
FieldCount := 1;
Sum := 0;
WHILE NOT EOF DO
  BEGIN
    Code := ExtractInteger(FieldIndex);
    FieldIndex := FieldIndex + 2;
    aField := ExtractField;
    IF FieldCount = 1 THEN
      WriteField(aField)
    ELSE
      Sum := Sum + IntNumOf(aField);
      { NOTE: No check is made to see if data is actually score}
  END

{data in the right format }
  IF FieldCount = NFields THEN
    BEGIN
      IF NOT Delimited THEN
        dummy := NextChar;
        FieldIndex := FieldStart;
        FieldCount := 1;
        WriteField(IntStrOf(Sum));
        WriteChar(chr(13));
        Sum := 0
      END
    ELSE
      BEGIN
        IF Code = 13 THEN
          FieldIndex := FieldIndex + 4;
          FieldCount := FieldCount + 1
        END
      END { while }
    END; { DoAdd }

BEGIN { Main }
theTypeList[0] := 'TEXT';
SetPt(ImpDlgPt, 100, 100);
SFGetFile(ImpDlgPt, '', NIL, 1, theTypeList, NIL, ImportFile);

```

```

WITH ImportFile DO
  IF good THEN
    BEGIN
      FileError := FSOpen(fName, vRefNum, IFRef);
      FileError := GetEOF(IFRef, logEOF);
      IF IsHeader(Header, BadFormat) THEN
        BEGIN
          HeaderString := CharsHandle(Header);
          Delimited := HeaderString^[3] = 'd';
          NFields := ExtractInteger(6);
          IF Delimited THEN
            BEGIN
              FieldStart := 10;
              Delimiter := chr(ExtractInteger(8))
            END
          ELSE FieldStart := 8;
          { 'FieldStart' is the beginning of the field part of }
          { the file, i.e real data }
          IF NFields > 1 THEN
            { need more than one field because name is field # 1}
            BEGIN
              OutFile := concat(fname, '.sum');
              FileError := FSOpen(OutFile, vRefNum, OFRef);
              IF FileError <> noErr THEN
                BEGIN

FileError := Create(OutFile, vRefNum, '????', 'TEXT');

FileError := FSOpen(OutFile, vRefNum, OFRef)
                END;
                FileError := SetEOF(OFRef, 0);
                DoAdd
                END
                ELSE SysBeep(6) { plus perhaps an alert }
                END
                ELSE SysBeep(6); { plus perhaps an alert }
              FileError := FSClose(OFRef);
              FileError := FSClose(IFRef);
              FileError := FlushVol(NIL, vRefNum)
            END { with, if }
          END; { Main }

BEGIN { SumScores }
  Initialize;
  Main
END. { SumScores }

```



Year	20	last two digits
SRRS Section Type	21	'1' if 'Lec' '2' if 'Lab' '3' if 'Sec' 'C' if course is graded by course 'I' if course is graded by individual
SRRS Section #	22	The numeric section number or blanks if course is graded by course or individual
Blank	23	
Term	24	'FA' for Fall or 'SP' for Spring

Standard Import/Export headers are stored in the application's resource

**Import:**

**Initial course information from Registrar**

ID = 1200, Name = 'Standard Import from Registrar'

**Course update - Drop/Add**

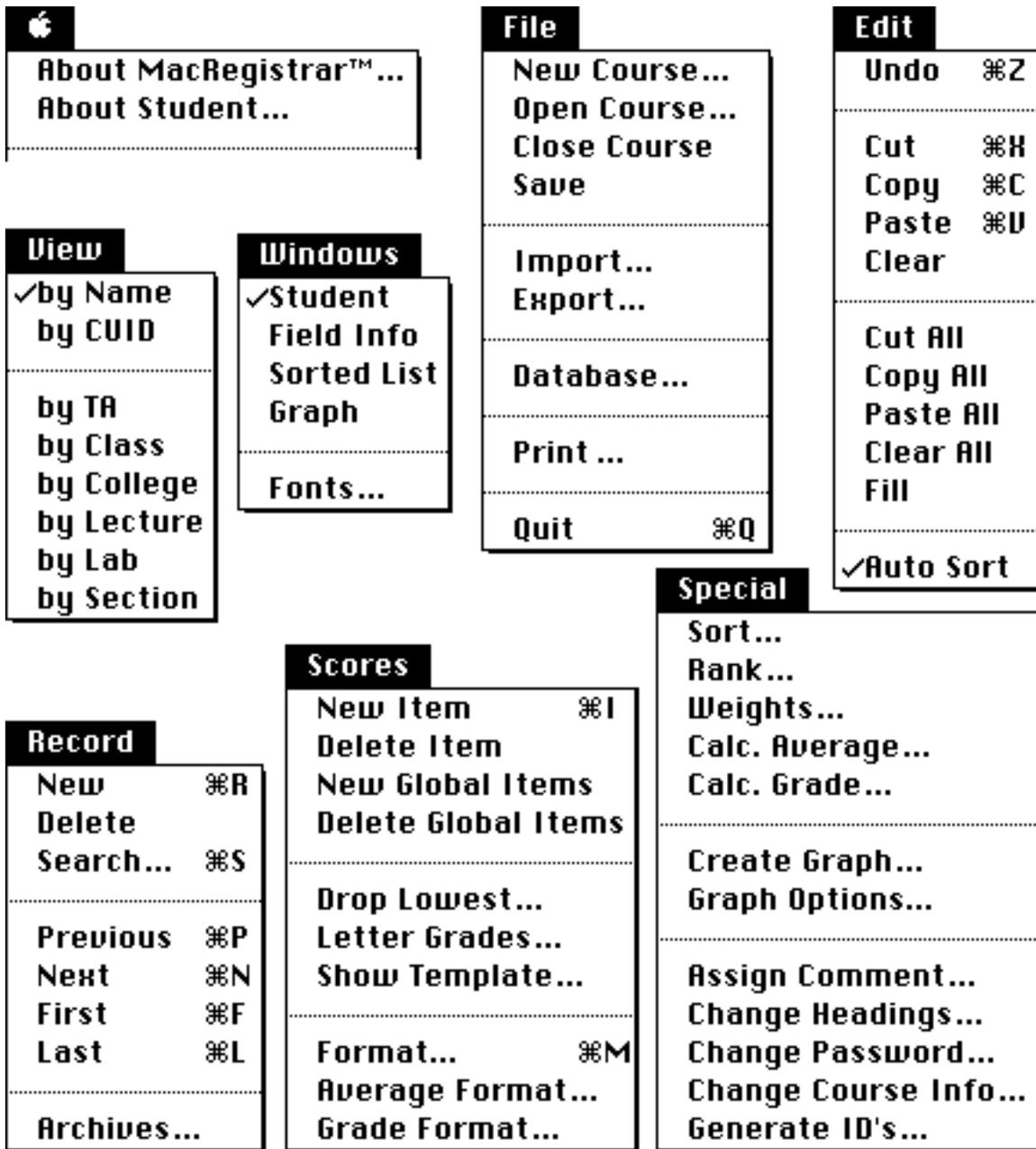
ID = 1300, Name = 'Drop/Add'

**Export:**

**Final to Registrar**

ID = 200, Name = 'Standard Export to Registrar'

**(Click on a menu command to go to its description.)**



Pull-down menus

[\(Click here to go to the Table of Contents\)](#)