October 20, 1986

Information about **Grades - Alpha 2.0**

Professor Jerry Keough
Department of Mathematics
Boston College
Chestnut Hill, MA 02167
(617) - 552 - 3755

Note: This version of Grades "replaces" an earlier version of a grading program (called Grades 0.96) that I wrote that's been circulating since March of 1985. Although functional, I would not term my earlier offering very polished, not very Macintosh-like. I've since adopted much more reasonable ideas about what makes a good Macintosh program, and this new offering shows it. Unfortunately for Grades 0.96 users, it does NOT read data files created by that program. That was a design decision made (perhaps erroneously) at some point, but that's just the way it is.

This program called **Grades - Alpha 2.0** is, as far as I can tell, reasonably bug free. I use it extensively, as do about ten or fifteen colleagues. We haven't lost a data set yet, although during development we occasionally lost the last few minutes work.

Grades - Alpha 2.0 is written for teachers to track a class of students. It maintains up to **20** grades for each student (a fixed limit that now cannot be changed), and allows the computation of weighted averages either in terms of raw scores or Z-scores based on those grades. Options to show or hide other pieces of information about a student (an "alias", such as a social security number, and a "grade" which can be assigned manually for record-keeping), plus the ability to select any subset of the recorded grades for averaging purposes (e.g., you can choose "only the tests", or "only the homework") yields a very useful utility. I've paid a lot of attention to Macintosh conventions (although not completely at this stage), so you should find the program easy to use despite this minimal amount of documentation.

How to use this program: you should find this program very much like a spreadsheet program. You are allowed to type new names at any time by just clicking in the "new" name box and typing. Pressing return adds the new name to the class list. You create a column in which to enter new grades by choosing "Enter New Grade" from the Organize menu. If you choose "Show Alias" from the Columns menu, you can enter information such as a social security number for each student. If you choose "Show Grades" from the Columns menu, you can record a "semester grade", useful for record keeping purposes only.

When you enter a new grade, you are asked to enter a.) a title for the new exam or test; b.) its maximum grade (must be in the range 0..9999), and a weight (a real number > 0 - see below). Having done that, a new column is added on screen and you can now enter grades as you would enter values in a spreadsheet.

You can show the average of students at any time (assuming that you've entered some grades, of course) by selecting "Show Average" from the Columns menu.

You can sort either by average (select "Sort by Average" in the Organize menu), or by name, alias or test grade by clicking in any of these columns and selecting "Sort by (whatever)" in the Organize menu. The (whatever) will always be the name of the column where your current selection or cursor is located. You'll find that sorting is reasonably fast, even for large classes of students.

You can resize text in the window by making selections from the Font and Size menus. All text in the window is limited to one font and one size, however. You can resize any column width in the window by pointing to its vertical separator line and dragging it.

Under "Preferences" in the Columns menu, you can choose how name sorts are done. For example, does "John Doe" precede "Fred Smith"? It does if you choose to sort "by looking at the last name first"; otherwise it doesn't. By the way, sorts are done without regard for capitalization and diacritical marks as Inside Macintosh suggests should be the case. (technical note: the last name is found by looking for the last interior space, if there is one. sorting doesn't properly respect abbreviations such as Dr.) You also decide whether averages are calculated from raw scores or Z-scores - see the section on weights below. Lastly, if you choose column widths to be uniform, changing the width of one grade column changes the widths of all grade columns.

Also under "Preferences", you'll find "Select Grades for Averaging ..." where you can choose which subset of exams of tests you want to calculate averages for. This will be useful if you put tests and homework into one class file - you can choose the tests and calculate an average; then choose only the homework and get a second average.

Lastly, under "Preferences" is "Show Statistics" which puts up a window with the computation of averages, standard deviations and weights for the exams entered. (see program limitations, however).

That's about it. The items under File and Edit are self explanatory with one exception. When you choose Print, you will be printing the current "data window" in which you see the names of students and their grades. You are first presented with a dialog which suggests that some combination of Names, Averages, Weights, ... , etc. will be printed along with this output. What you need to know is that 1.) the printout will be faithful to existing column widths and which exams or tests are currently shown in that window, with proper font and size choices, and it will properly lay out the data tableau over multiple pages if necessary; b.) if the alias column is hidden, you do not have the option of turning off names on the output - however, if the alias column is shown, you may select NOT to print the names column (useful for printing public listings of grades in the class); and c.) the other options to print the averages, maxima, standard deviations and so forth HAVE NO EFFECT ON THE PRINTOUT, NO MATTER WHAT THEIR SETTINGS. IN FACT, NONE OF THESE VALUES WILL PRINT AT ALL. The reason is simple - I never wrote the code to do it. The only way to get a hardcopy version of the statistics is to do a window dump of the Statistics window (or, heaven forbid, write them down by hand).

Limitations & Restrictions:

- maximum number of grades per student: 20
- maximum number of students: limited by memory (but no explicit warnings if you run out of memory entering too many names!). All data is kept in memory. Most data structures are dynamic, and this runs very well on a 128K Macintosh (although I don't have a maximum student number to submit).
- grade range: every grade must be in the range 0..9999
- maximum name length: 25 characters (no warning if you exceed this - extra characters are dropped)
- maximum alias length: 10 characters (no warning if you exceed this - extra characters are dropped)
- maximum grade field length: 2 characters (no warning if you exceed this - extra characters are dropped)

Hints, hidden features and work-arounds:

- Any exam title, maximum grade and weight can be changed by double-clicking on the exam title. This brings back the original dialog box where you set these items.
- Editable columns can be locked by clicking on their title (to select that column) and choosing "Lock" from the Columns menu. If a column is locked, its entries are no longer editable until you choose to "UnLock" the column.
- Student records can be selected as a whole by clicking on the record number at the left. Of course, record numbers must be shown (from the Columns menu) to do this. Only one record can be selected at a time. Once selected, a student record can be deleted from "Clear" in the Edit menu, or by pressing the BackSpace key.
- Pressing Return or Enter advances down to the next record (usefel for entering a long list of grades). Pressing these keys while holding the Shift key moves you UP in the tableau. The Tab key moves you to the right; and Shift/Tab moves you to the left.
- Double-clicking on the record numbers, alias, grade or average column titles hides these columns. You don't have to go to the Columns menu.
- The Grades column has a use only for entering the "final" grade, such as A+ or F. The field's value cannot be calculated for you automatically in any way.
- The data window does not have horizontal scrolling; however, by making proper choices from the "Select Grades for Averaging ..." item, you can bring any exam or test into view for editing.
- The Statistics window does not allow editing in any form, nor can its column widths be altered. Its size is fixed by what ever is the current font and size of the data window when the statistics window is opened. If you don't like the size, close it; make a new font and size choice from the font and size menus; and then open the Statistics window again.

Known problems:

Deleting the last student in a class is a fatal crash. Try creating a new file, OK ?
Error messages could be better.

Weighting and Average computation:

Exams can be weighted. The usual understanding goes like this. Suppose you give three tests in a class, and decide that the first will count 30% of the grade; the second 30% of the grade; and the final 40% of the grade. Suppose that the number of "points" on the first test is 100; the number on the second is also 100; and the number on the third is 150. When you enter the first test, enter a maximum of 100 and a weight of 30. Do the same for the second test. For the third, enter a maximum of 150 and a weight of 40.

If Johnny scores grades of 80/100, 60/100, and 120/150, then Johnny's grades are computed as the raw averages of 80%, 60% and 80%; and the weighting of the exams will produce a grade of:

(80%*30%) + (60%*30%) + (80%*40%) = 74%

On the other hand, if you don't want to weight exams in this manner, but prefer to just "total up the points", then the easy way is to MAKE THE WEIGHT OF EACH TEST BE THE SAME AS THE MAXIMUM GRADE FOR EACH TEST. In this case, Johnny's grade would be computed with weights of 100, 100 and 150 and would wind up being:

(80%*100) + (60%*100) + (80%*150) = 260/350, or 74.28%

So, you decide how you want to use the weighting. If you choose to "Select Grades for Averaging ..." and choose a subset of all the grades, the weighting gets a little more interesting. For example, if you weighted the grades at 30, 30 and 40 percent as we did originally, and choose to select only the first two grades for averaging, then Johnny's average is:

(80%*30) + (60%*30) = 42% out of 60% of the grade = 70%

That's the right answer, by the way, because you weighted the tests equally. Each grade now counts 50% of the average since they count equally, and that's what the Statistics window will show in the "Percentage" box.

I'm not going to explain Z-scores here. However, suffice it to say that if you choose to compute averages by Z-scores, the same weighting scheme takes effect on the standardized Z-scores for each test, rather than its raw score (in the form of a raw percentage).

Lastly, if you choose not to enter a grade for a student (by simply leaving the entry blank), then that student's average will appear in outlined form as an indication that the student's average has been estimated. The specific way of treating the student's missing grade is to not count the student in the computation of the class average for that exam, and to assume that the student's score on that exam WAS THE SAME AS THE CLASS AVERAGE. This may not be what you want and you can, of course, enter explicit zeroes for students if you wish. My reason for doing this is that when students miss an exam, a.) the class average is thrown way off to the point that it's useless to me; and b.) when the student asks "what grade do I have to get to get such and such a grade?", I can now point out that if the student gets an above average grade, he'll move up in the rankings, and if he gets a below average grade, he'll move down.

Support and Comments:

There are many things I want to do in the next release of this program. However, the current source is about 13,000 lines of assembly code (that's with a lot of comments and spaces, so it's a little inflated). It's gotten to the point where I've decided to throw out the code and write it in Pascal, now that it's possible to do real development on the Macintosh using Pascal. Consequently, GRADES - ALPHA 2.0 IS WHAT IT IS, AND THERE IS NO GUARANTEED UPGRADE PATH OR BUG FIX CAPABILITY. I intend that the Pascal translation will be an improvement and will share most of the design of this program; and that it will read (either directly or through some conversion program) data created by this program. However, I'm not guaranteeing it.

If this program does what you want it to do, use it. If you want improvements, I'm happy to field your requests; but I don't know when I'll get the next level of this up and running. Right now, time is tight and I only get to write code every two or three weeks. I'm hoping that by January I'll be back to where I am now! In any case, the only thing I can say in closing is that a.) I use this program, as do several others here at Boston College, and it is reliable; and b.) eventually, this will get improved.

YOU DECIDE HOW TO INTERPRET THIS. I OFTEN THOUGHT I'D SELL THIS PROGRAM FOR REAL MONEY, BUT I JUST CANNOT SUPPORT IT. IT'S TIME TO "LET GO". THAT IS NOT A STATEMENT THAT "THIS DOES NOT WORK", NOR AM I AWARE OF ANY BUGS SUCH AS MISCOMPUTATION OR DATA DESTRUCTION. IT IS A STATEMENT THAT YOU MUST USE THE PROGRAM AS IT EXISTS AND NOT EXPECT ANYMORE THAN WHAT IT PROVIDES. I THINK IT'S A GOOD PROGRAM AND I'M HAPPY WITH IT.

Jerry.