Spreadsheet Case 8

Waldman Lumber Company

Problem:	Develop an accounts receivable system
Management skills:	Organize Control
PC skills:	Date functions Database querying Logical functions

File: Wald_q.xls

Waldman Lumber Company has been a major wholesale and retail supplier of lumber and paneling for the Milwaukee metropolitan area since 1939. Its customers include contractors and local families. Waldman employs 12 people, including an accountant, warehouse workers, and sales floor staff. Gross revenues total $8,000,000 annually.

Waldman has remained essentially a family business. The original owners, Ernest and Ruth, have retired, and their son, Donald has taken over. Don is concerned that the firm is not generating as much revenue as it should to pay his monthly salary. He suspects this is because too many bills are outstanding. His parents ran the business on a largely goodwill basis. All their accounting records were maintained manually, and they would remember who had not paid up. They shied away from calling late payers about their bills if they were "old timers."

In the past Waldman's suppliers were quite lenient about repayment. Now they are much more demanding of small firms, since their primary business is the large discount and home supply chains. The large manufacturers will offer Don a 2% discount for payment within 10 days, but have threatened to stop supplying him if he does not pay within 30 days. Don needs to collect his own bills faster in order to remain in a business dominated by giants.

Don would like his accounts receivable file automated and organized so that he can easily locate late payers. Load the data file Wald_q.xls from your data diskette to see the outline of the accounts receivable file. It contains a sample of Waldman's accounts receivable list as of April 1, 2001. Don would like to type in the date (today's date) whenever he accesses the file and have the days outstanding for each account automatically calculated. He would also like to produce an aging report that automatically classifies the records according to four categories of lateness: current (30 days or less), over 30 days, over 60 days, and over 90 days.

Don would also like some reporting mechanism to identify late payers so that he can phone them and expedite reimbursement. The accounts receivable file should be sorted first by largest number of days outstanding to smallest and then by highest invoice balance to lowest. A listing of customers more than 60 days late with outstanding balances over $400 would also be useful.

Tasks

There are 5 tasks to this problem:

1. Calculate the number of days each invoice has been outstanding. This is the difference between the transaction date and today's date.

2. Classify the invoices using formulas into the four categories shown on the worksheet. Hint: you can use logical functions to classify the invoices.

3. Sort the database in descending order using the number of days outstanding as the primary sort key and the invoice balance as the secondary sort key. Print the sorted database (including the additional information you just provided on categories of lateness.)

4. Use the data base extract capabilities of your spreadsheet software to extract two reports. The first report will show relevant information on customers who are more than 60 days late. The second report will show relevant information on customers more than 60 days late who owe more than $400. The criteria range for the data base query required by both reports is provided at the bottom of the worksheet.

5. Print the two reports resulting from your data base queries.

Time Estimates

Expert: 1 hour
Intermediate: 2 hours
Novice: 3 hours

Excel Tutorial For Spreadsheet Case 8

This case requires new skills utilizing Excel data management capabilities and date functions. You will need earlier versions of Course.xls for this tutorial. If you saved it with regression analysis data or the range name table, you should erase these parts of the worksheet.

Excel Date Functions

In order to determine how many days an account is overdue, you must be able to calculate the difference between today's date and the date of a customer's invoice. Such

calculations are possible using the =DATE function of Excel and by formatting the ranges involved in date calculations in **Date** format.

The =DATE function converts a date into a date number. Excel can represent any given date as a serial number equal to the number of days from December 31, 1899 to the date in question. (Excel also has a "1904" date system where the serial number represents the number of days since January 1,1904) Dates and times thus can be used in calculations like any other number in Excel.

The format of the =DATE function is:

=DATE(year number, month number, day number)

For practice purposes, let's modify your sample spreadsheet to include data about due dates for students' library books. You will then calculate the number of days overdue by subtracting the date due for each student's books from today's date.

Create a new range for book due dates in F14:F18. The first row will contain the column label DUE DATE and F15:F18 will contain date information for each student as follows:

James Jackson:	2/2/01
Steven Parker:	3/3/01
Andrew Reynolds:	4/11/01
Joyce Winters:	5/5/01

To enter this date for James Jackson using the =DATE function you would enter in cell F15 =DATE(01,2,2). F15 would then display 2/2/01 since Excel automatically formats cells containing the DATE function.

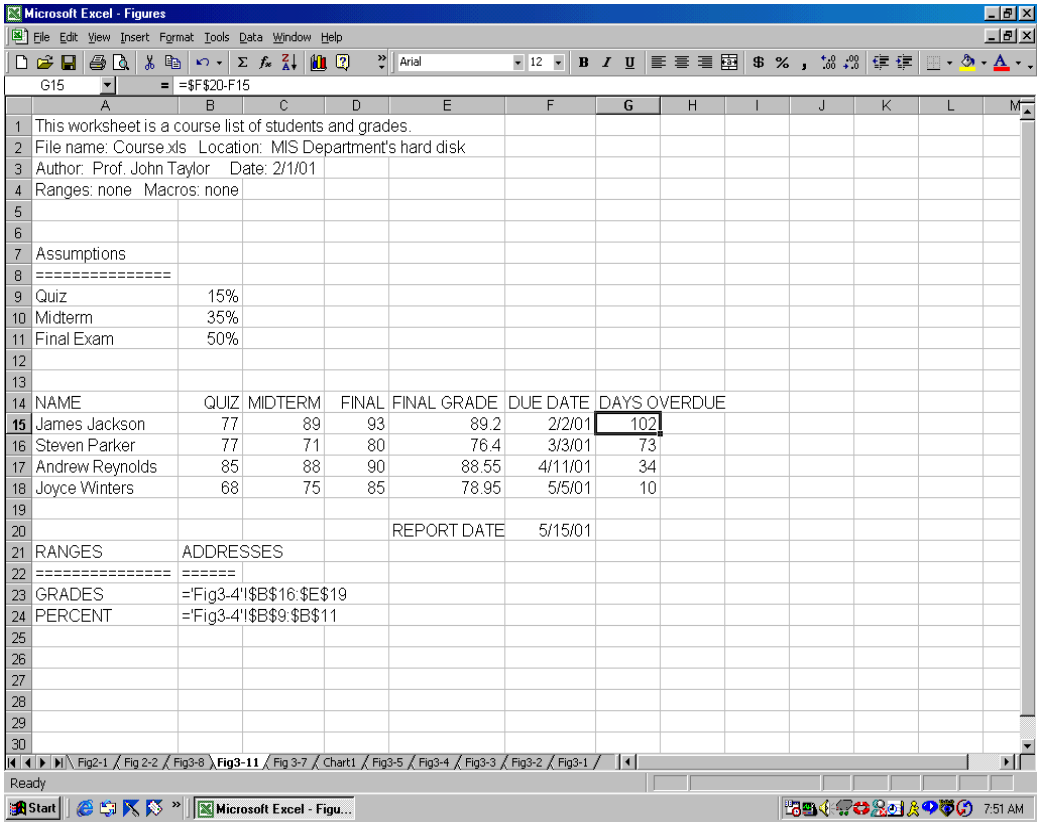
You can enter the due dates for the rest of the students using =DATE. Then enter the label REPORT DATE in cell E20 and enter the date of this student roster report (5/15/01) in F20 using =DATE. Using this date and the student book due dates, calculate the overdue days.

You will want to calculate the number of days each student's book is overdue in range G15:G18. Enter a label for DAYS OVERDUE in G14. The calculation can be performed by subtracting each student's due date from the report date. Since both dates are entered using the =DATE function, the formula for calculating DAYS OVERDUE for James Jackson is =F20-F15. Enter this formula into cell G15 and copy it to G16:G18. Make sure the cells in DAYS OVERDUE column are in General format. Your worksheet should look like Figure 3-11.

Database Management with Excel

The student roster you have created in A14:G18 can be treated as a database, where data can be extracted, sorted, and analyzed. Each row with data about a student can be considered one *record* in the database. Within each row, each cell represents a *field* of that record. The one-line headings at the top of each column, such as NAME or QUIZ, represent *field names*.

Figure 3-11



Any collection of data organized into records and fields can be treated as a database by Excel. Fields in a Excel database may contain either labels (such as the student names in our roster) or numeric data (such as the student grades).

You can use various data commands with a Excel database to sort its records in numeric or alphabetical order, or to find and list records that match criteria that you specify. Let's first sort our student roster database and arrange it by number of days overdue in ascending order.

First, select the range A14:G18, which contains the data and the column headings. Now select Data/Sort from the menu. The resulting dialog box shows three sort keys are available to rearrange the sequence of the database. These are known as the *primary, secondary*, and *tertiary* sort keys. Notice, the selected range now highlights the data only, excluding the headings. Excel has recognized the selection has field names in the first row and deselected the headings.

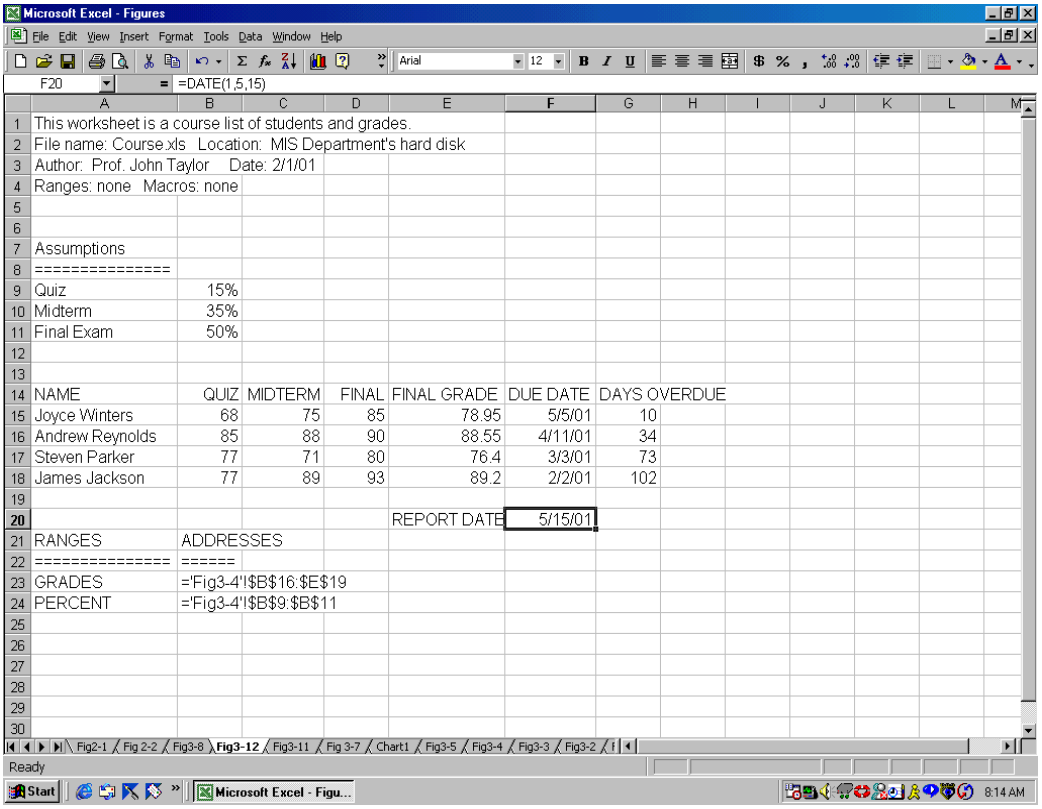
Each of the sort keys in the dialog box has a drop-down list of field names. By pressing the downward pointing arrow the list will be revealed. Select the DAYS OVERDUE field from the primary sort key at the top of dialog box and select Ascending order for the sort. We could select a secondary sort key to perform a second sort on records that have the same

entries on the primary key. However, in our list of Students' Grades, there are no equal entries on DAYS OVERDUE.

The setting at the bottom of the Sort dialog box asks whether the list includes or excludes a Header Row (containing field names). Specify that the selection (A14:G18) contains a Header Row. If you specify that the list does not contain a header row, the heading row will be sorted with the data.

To execute the sort, select the OK Button. Your course roster will then be sorted so that Joyce Winters, with 10 days overdue, will be first on the list and James Jackson, with 102 days overdue, will be last on the list. (See Figure 3-12).

Figure 3-12



Filtering a Database

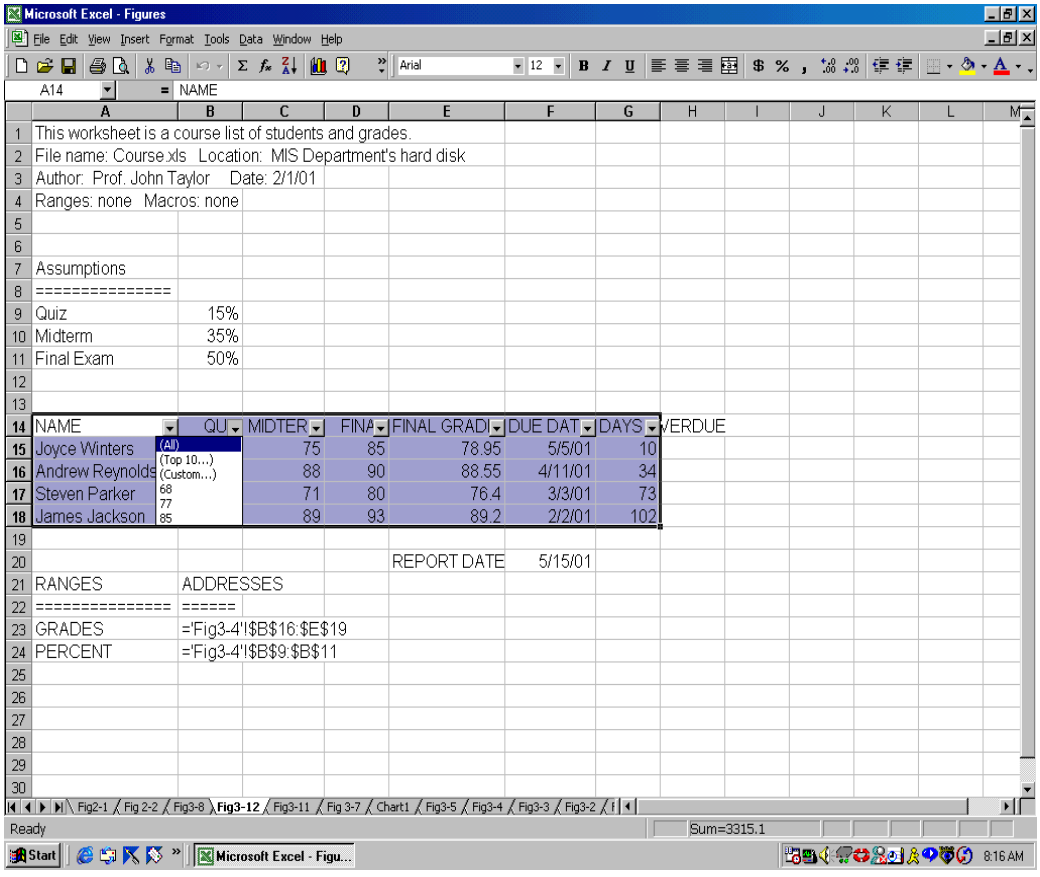
You can search a database for particular records, copy or extract records from a database using the **Data/Filter/AutoFilter** or **Data/Filter/Advanced Filter** commands of

Excel. For example, you can filter your student database to produce a list of all students whose books are more than 45 days overdue.

The **AutoFilter** and **Advanced Filter** do the same thing in different ways. An Excel Filter lets the user dictate some criterion or criteria which will include some records and exclude others. **AutoFilter** performs the filter operation on the list at the same location. The **Advanced Filter** gives the user the option whether to filter on the same location as the list or to copy to a new location. The **Advanced Filter** also permits more complex criteria than the **AutoFilter**, although the **AutoFilter** satisfies most demands.

The **AutoFilter** is a simple but extremely effective tool to distil large amounts of data very quickly. To demonstrate its usefulness, highlight the database in the range A14:G18. Now select **Data/Filter/AutoFilter** from the menu. You will notice the AutoFilter drop-down arrow buttons next to each of the field names. These buttons are how the query is achieved. Press the drop-down arrow on the QUIZ field and your screen should look like Figure 3-13

Figure 3-13



The **AutoFilter** drop-down menu contains items such as: (All), (Custom...), (Top 10), (Blanks), (NonBlanks), and an entry for each unique list entry. The (All) item displays all the records; the (Custom...) item lets you enter a criterion for the current field. The (Top 10) item displays all rows that fall between the upper and lower limits you specify. The (Blanks) item

displays the blank records in this field only. The (NonBlanks) item displays all the records that are not blank. These last two items appear in the AutoFilter menu only when the column you want to filter contains a blank cell. The remaining items are the entry items; selecting one of these entries will display those records with that entry only. Select 77 from the QUIZ drop-down list and observe the effects. All the entries other than those with 77 in the QUIZ field are hidden and the row numbers of the remaining entries are colored. Select (All) from the QUIZ drop-down menu to return to a full list.

Select the DAYS OVERDUE drop-down menu and select (Custom...) from the menu. The Custom AutoFilter dialog box permits one or two simple conditions connected with an OR or an AND. If the field being queried is text the box for the first logical operator on the left should be an "=" or "equal to". For our purposes, select ">=" (greater than or equal to) as the logical operator and type 45 in the value window to the right of this logical operator box to represent DAYS OVERDUE >= 45 (greater than or equal to) 45 days. Press the OK Button to execute the query. The list should have two records displayed now: Steven Parker and James Jackson. If you wanted a separate permanent copy of the results of an AutoFilter query, you would have to manually copy them. To turn off the AutoFilter, select **Data/Filter/AutoFilter**.

The Advanced Filter permits more advanced criteria than the AutoFilter. It requires a criteria in a separate location on the worksheet. This is best done by copying the field names from the original list so no typing error can creep in. Copy the headings to Row 23, directly below the list. Type >45 under the DAYS OVERDUE heading in the criteria. (You will have to erase or move further down the range name table you created in an earlier tutorial.)

Now select **Data/Filter/Advanced Filter**. In the Advanced Filter dialog box, select Copy to Another Location to provide a separate list for the result of the query. For this Action setting, the Copy to: window becomes active and requires a reference. Three references are required for this dialog box: the List Range, the Criteria Range and the Copy to Range. Select the ranges:

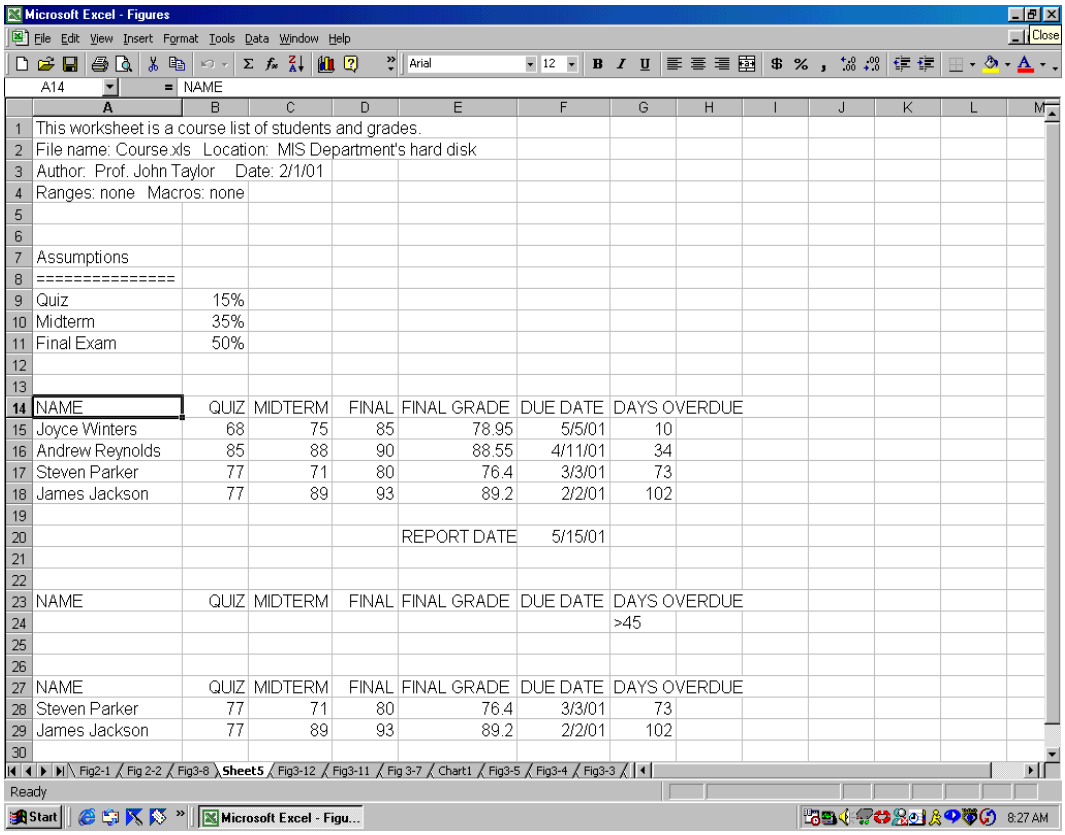
List Range	A14:G18
Criteria Range	A23:G24
Copy to Range	A27:G27

Now select the OK Button to execute the query. The resulting screen should look like Figure 3-14.

The **Criteria Range** setting in the Advanced Filter dialog box tells Excel which records to search for in the database. Your search criteria may include one or several fields in the database. The criteria range will have at least two rows: one for the heading and one for the selection criteria.

The first criteria row *must* be the field names of all of the fields that will be referred to in your search criteria. The second row of the criteria range is where the various selection criteria are entered. Each criterion must be entered directly below the field name to which it applies. Criteria may be numbers, labels, or formulas. A criteria range can be two or more rows long.

Figure 3-14



To search for exact matches of labels, enter the label used as a criterion exactly as it appears in the database. You can also search for similar, but not identical, label entries using special characters called *wildcards*. Wildcards can be used in both Advanced Filter criteria and AutoFilter criteria:

? instructs Excel to accept any character in that specific position and can only be used for fields of the same length. (For example, b?t matches bit or bat but not beet.)

* instructs Excel to accept any and all characters that follow and can therefore be used for fields of unequal length. (For example, bat* matches batch or batter, but not butter.)

The Copy to Range determines the destination of the extracted records and the field names are copied as well. This option is only active when the Copy To Another Location has been selected. The Copy to Range should be an unused area of the worksheet.

Be sure to save Course.xls with the changes resulting from the Advanced Filter operation. It will be required by the tutorial for Spreadsheet Case 10.