CS130/230 Lecture 3
Formatting, Logic and Graphing

Monday, January 11, 2004

More Formatting

We talked a little bit about formatting during our first class meeting. We know how to format numbers in cells.

There is much more to formatting than just this. You can format the alignment, fonts, borders, and background colours of cells.

Problem 1

Consider the following table of data representing sales for various branches of a bookshop in England.

```
Ye Oldie Book Shoppe
2004 Sales
                  Colchester      Oxford    Cambridge     Liverpool
Fiction                 3230        4530         2150           230
Biography               5300        6390         6299           549
Reference               3599        7395         3053           912
First Edition           9232       11003         2351          1052
Children                5234        5372         2692           384
```

Part I: Grab the above information and place it in an Excel document.

Part II: To center a title, follow the steps below:
>   Select the cell with the text
>   Modify the text's font, size, color
>   To center, select the range of cells and go to the cells option in the format menu. In the alignment tab, check the merge cells box, and change the horizontal alignment to center.

Part III: You need to format the table data. You can either format it yourself by changing the fonts and background colour (which is what I did), or you could use the Excel AutoFormat feature.

AutoFormat uses predefined Excel formatting features as follows:

>   Select the range of cells to be AutoFormatted
>   Go to Format on the menu bar and select AutoFormat
>   Select the AutoFormat option of choice

Part IV: Insert a picture. You can insert a picture anywhere in your spreadsheet. To do this, go to the insert menu and select picture then either (picture from file) if you have your own picture that you want to use, or (clipart). I used a clipart picture. Don't worry if you can't find exactly the same picture. Just pick one that you think looks good.

Part V: Insert a chart to visually depict the data.

The goal is to produce the following worksheet:
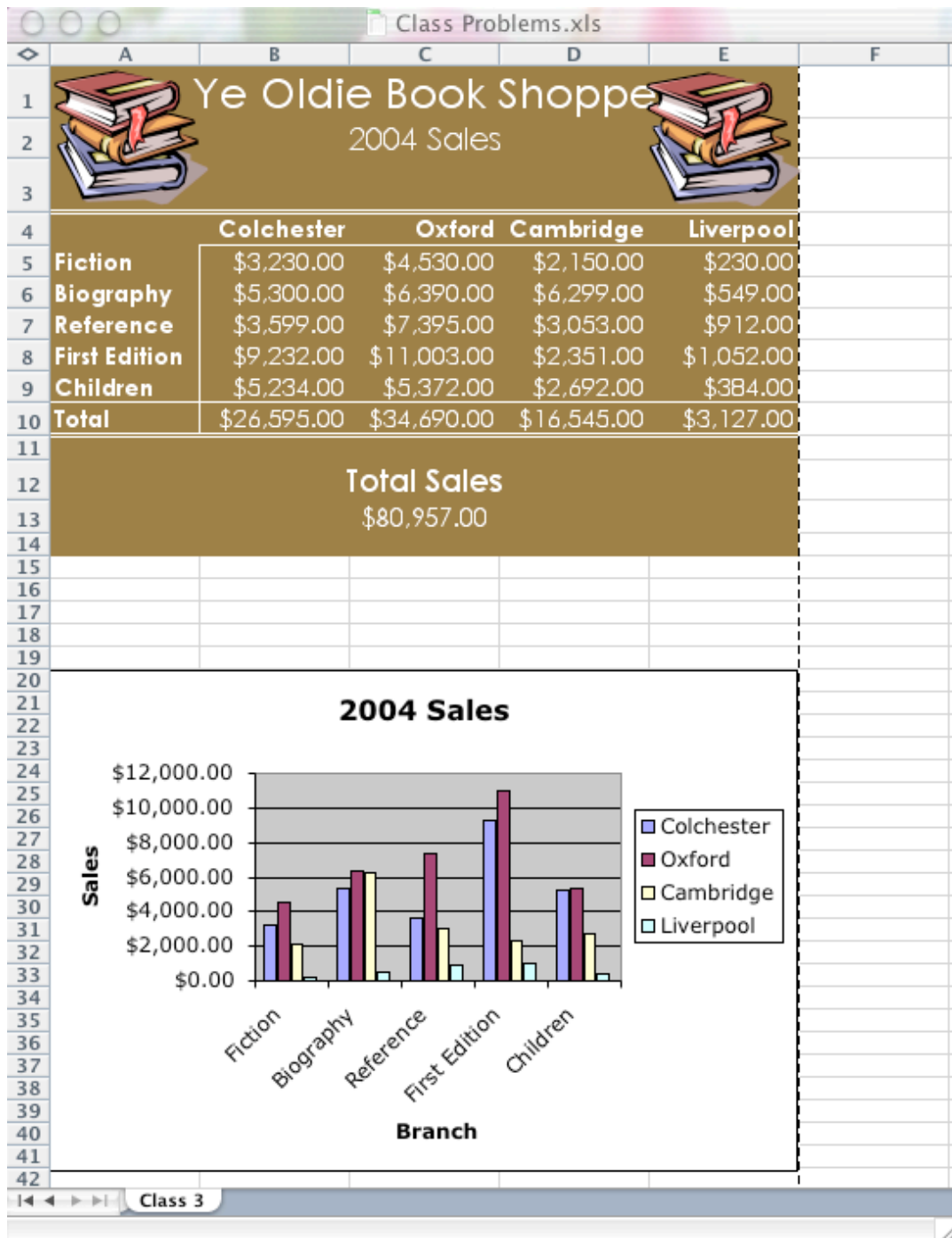
Printing

Let's have a look at what the spreadsheet would look like if we printed it out. Click on the (Print Preview) toolbar menu.

You will probably find that you will need to make some adjustments before you can print the page. You might need to change the page orientation from portrait to landscape. You also might need to adjust the margins. You can do this by going into the Page Setup menu item in the file menu.

One of the useful features under the margins tab is the centre horizontally and centre vertically option. This centres your spreadsheet in the middle of the page.

After your adjustments, the bookshop spreadsheet should look like the following in (Print Preview):
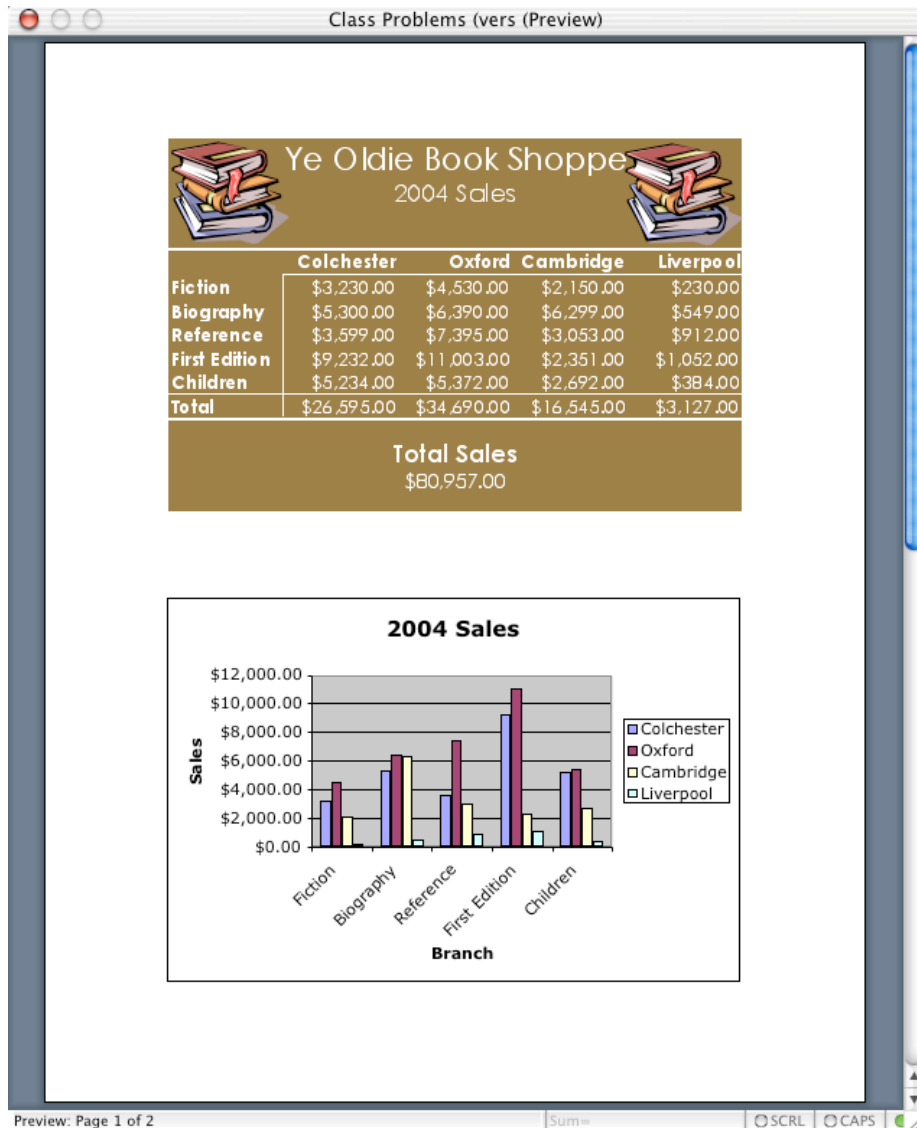
Comparison Operators

You can use comparison operators to compare two numbers, functions, formulas, or labels and return either true or false.

Examples include:

=2*3=4+2
=A1>0
=average(a1:a10)>50

Every conditional test must include at least one comparison operator. As an example, in the formula =A1>0, the comparison operator is >. The following six comparison operators exist in Excel:

Comparison Operator	Definition
=	Equal to
<>	Not equal to
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to

IF Built-In Function

The IF function checks a condition that must be either true or false. If the condition is true, the function returns one value; if the condition is false, the function returns another value.

The syntax of the IF function is:

=IF(logical_test, value_if_true, value_if_false)

Problem 2

You are the owner of a small business and every month you need to take a person's hours-worked and hourly wage and calculate gross and net pay. Gross pay is hours worked times hourly wage and net pay is gross pay minus: (1) Social Security (7.65%) (2) State Income Tax (8.5%) and (3) Federal Income Tax (15%). Set up a worksheet that allows the owner the ability to enter hours worked and hourly wage; your worksheet then displays: Gross Pay, Social Security, State Income Tax, Federal Income Tax, Net Pay. Your worksheet must handle overtime such that any hours over 40 earn time and one half. If a person was making $5.00 per hour and worked 45 hours, for 5 hours they made $7.50 per hour.

Logical Operators

Sometimes our logical_test needs to use a logical function such as AND and OR:

The syntax for each of these statements is:

OR(logical test#1, logical test #2)

AND(logical test#1, logical test #2)

For the OR construct, a value of TRUE is returned if EITHER of the logical tests returns a value of TRUE; otherwise, a value of FALSE is returned to the cell.

For the AND construct, a value of TRUE is returned if BOTH of the logical tests return a value of TRUE; otherwise, a value of FALSE is returned to the cell.

Note that you can have more than TWO logical tests within an OR or AND statement by simplify separating each subsequent logical test with a comma.

Often, the OR and AND constructs are used within an IF statement. For example, the statement

IF(AND(1<2,4=3),"HELLO","GOODBYE")

will return to the cell "GOODBYE" because both 1<2 and 4=3 are not true. However, the statement

IF(AND(1<2,4=4),"HELLO","GOODBYE")

will return "HELLO" to the cell.

Problem 3
Consider the following data:

Name	ID#	Quiz1	Quiz2	Midterm	Final
Adams	0001	14	23	82	76
James	0002	12	21	76	68
Jones	0003	15	24	91	93
Mann	0004	14	19	88	73
Smith	0005	11	16	79	71
Tolls	0006	10	13	62	65
Wells	0007	5	10	43	55
Points		15	25	100	100

Part I: Add two additional columns as follows: (a) Average is a person's total points are divided by the total points possible (b) Grade is 90-100 A, 80-90 B, 70-80 C, 60-70 D, 0-60 F.

Part II: Create a Pie Chart that shows the percentage of A's, B's, etc. Hint: you will need to use the COUNTIF function. You can look up how it works in Excel help.

Graphing with Large Amounts of Data

Problem 4

The file 'education.txt' in the 'CS130 Pub' folder contains information about education in the United States divided by state. The numbers listed next to each state represent the following:

- Cost per pupil
- Pupil/teacher ratio
- Mean annual teacher salary
- Percentage of students that take the SAT test
- Mean verbal score on the SAT test
- Mean math score on the SAT test
- Mean total score on the SAT test

Copy the data in this file into an Excel worksheet. You will need to format the data using the 'Text to Columns' option in the 'Data' menu.

A useful feature in Excel is the 'Freeze Panes' feature in the 'Window' menu. Select the top left number in the table and click on 'Freeze Panes'. This will make any rows above this cell and any columns to the left of the cells freeze, while you can still scroll the rest of the spreadsheet.

Add a column chart to your spreadsheet that will show the differences in SAT scores (verbal, math and total) between two states of your choice. Label your chart correctly.