

Lab 3, Spreadsheet Basics

CS 0131, Software for Personal Computing
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We hardly can go a day anymore without encountering data in some form, and the ability to organize, calculate, and evaluate quantitative data is an important skill for decision-making, both in our personal and professional lives. While tables in Word were useful, they can be a bit clumsy if we're doing heavy-duty calculations. Excel, on the other hand, is made for this type of thing!


Spreadsheets can be used to track expenses for a household budget, project sales for retail managers, track donations and expenditures for charitable organizations, track the results of scientific experiments, and the list goes on. Performing these calculations by hand is certainly possible — after all, that's how they did it in the “old days” — but if you were to make a mistake, you'd have to retrace your steps, or worse, start over from scratch. With electronic spreadsheets like Excel creates, correcting errors is easy. As long as the formulas defining the input-output relationship are correctly constructed, results recalculate automatically, saving you a bunch of time!



1 Excel Navigation

Recall that a spreadsheet is a grid of cells. Each cell lies at the confluence between a column running vertically and a row running horizontally. Columns in Excel are labelled with letters while rows are labelled with numbers. Any cell, then, can be uniquely identified by its corresponding column and row; for example, the cell at the intersection of column **A** and row **1** is referred to as cell **A1**. Often, we might wish to refer a range of adjacent cells; we'll use the notation **A1:A5** to mean “the range of adjacent cells starting with cell **A1** and ending with cell **A5**.”

We can typically navigate cells very simply by using the arrow keys and can select a range of adjacent cells by holding down  as we use the arrow keys. Note, though, that depending on what we're doing, using the arrow keys might select text *within* a cell instead. As such, Excel also lets us move right one cell by pressing  and down one cell by pressing .

If you make a mistake inputting data into a cell, you can always just select the cell and type over it. If your mistake is more minor, though, like a spelling mistake, you might not want to retype the entire contents of the cell. Instead, you can do one of three things to edit it:

1. Select the cell and then click in the Formula Bar to edit.
2. Double-click the cell to edit.
3. Select the cell and press  to edit.

Try each out and see how convenient each method is! In any case, once you're editing a cell, you can use the arrow keys to navigate the text *within* the cell. To exit edit mode and return to navigating cells, press  or .

2 Creating a Price List

As the assistant manager of OK Office Systems, you need to create a spreadsheet of your products that shows the cost (the amount you pay your suppliers), the markup percentage (the amount by which that cost is increased), and the retail selling price for each. In addition, you need to list the discount percentage (such as 25% off) for each product.

You'd like to extract some useful information from this data, so you'll use formulas for that. After planning the relationship between your inputs and outputs, you're ready to create your worksheet.

1. Create a blank workbook in Excel and save it as **pricing.xlsx**.
2. In cell **A1**, type "OK Office Systems Pricing Information", then press **Enter**.
3. Notice you're now in cell **A2**. Type today's date, "2/6/2013" and press **Enter**.
4. Go to cell **A4** and type "Product". Continue typing the following into cells **A5** through **A10**:

	A
5	Computer System
6	Color Laser Printer
7	Filing Cabinet
8	Desk Chair
9	Solid Oak Computer Desk
10	28" Monitor

5. Go to cell **B4**. Type "Cost" and press **Tab**. Notice you're now in cell **C4**. Continue typing the following into cells **C4** through **G4**:

	C	D	E	F	G
4	Markup Rate	Retail Price	Percent Off	Sale Price	Profit Margin

6. Now that you've entered some descriptive labels, let's enter some values. Enter the following into cells **B5** through **E10**:

	B	C	D	E
5	400	0.5		0.15
6	457.7	0.75		0.2
7	68.75	0.905		0.1
8	75	1		0.25
9	700	1.857		0.3
10	195	0.835		0.1

Hint: You may find that using the numeric keypad on your computer (if it has one) will help you input numbers faster; just make sure **Num Lock** is on!

Note that there are no values in column **D**; we'll calculate these later. Also note that your markup rates and percentage discounts are expressed as decimals.

7. The retail price in column **D** should be the retail price plus the percentage markup. In cell **D5**, enter the formula **=B5*(1+C5)** and press **Enter**.
8. The sale price in column **F** is calculated as a percentage off the retail price. In cell **F5**, enter the formula **=D5-(D5*E5)**.
9. The profit margin in column **G** is the percentage of the sale price which represents profit above the product's cost. In cell **G5**, enter the formula **=(F5-B5)/F5**.
10. Now that we've calculated these values for the first item, let's use AutoFill to do so for the others:

- a. Select cell **D5**. Click and drag the fill handle down to cell **D10**.

Note: The original formula in cell **D5** was `=B5*(1+C5)`, but if we look at cell **D6**, we see instead the formula `=B6*(1+C6)`. Excel adjusts the cell addresses in the formulas it copies down a column so that the results are based on each row's data rather than using the original formula's cell addresses throughout. By and large, this "relative addressing" is a useful feature, but it might be *too* powerful at times. In future lectures, we'll discuss how to fine-tune its use.
 - b. Select cell **F5**. Double-click the fill handle. Note how Excel detects the blank row and stops copying the formula below row **10**.
 - c. Select cell **G5** and use one of the AutoFill methods to likewise copy that formula into the range **G6:G10**.
11. Press **Ctrl**+**`** (the grave accent mark) to toggle the display to view formulas. Note how AutoFill copied your formulas with relative addressing, then return to normal view.
 12. Let's update a few values:
 - a. Change the value in cell **B5** to 475.5.
 - b. Change the value in cell **C6** to 0.755.
 - c. Change the value in cell **E7** to 0.05.

Note: Observe how the results of the retail price, sale price, and profit margin change once you edit these values.
 13. You just realized you don't have enough filing cabinets in stock to offer them on sale, so delete row **7**.
 14. You decide you need a column to display the dollar amount of profit, not just the percentage profit margin:
 - a. You'd like to keep that information nearby, so select column **G** and insert a column before it. Notice that the cells in column **G** move into column **H**.
 - b. In cell **G4**, type "Profit Amount" then press **Enter**.
 - c. In cell **G5**, enter the formula `=F5-B5`.
 - d. Copy this formula to cells **G6:G9**.
 15. Now, let's create some headings to break out the different types of products you sell:
 - a. Insert a row above the "Computer System" row, and type "Electronics" in the first cell of this new row.
 - b. Insert a row above the "Desk Chair" row, and type "Furniture" in the first cell of this new row.
 16. Notice that the labels in column **A** are getting cut off because they're too wide for the column. Position your mouse pointer between the headings for columns **A** and **B**. When the pointer looks like a double-headed arrow, double-click the border.
 17. Whoops! That's too far! You notice that Excel resized the column to fit the contents of cell **A1**, your title. Instead, we'll drag the border between columns **A** and **B** to decrease its size. Drag the border until the width is "23.00 (166 pixels)", then release.
 18. Now let's merge the cells for our headings. We can do this in much the same way as we did with tables in Word:
 - a. Select the range **A1:H1**, and select **Home** > **Merge & Center**.
 - b. Change the font size of this title to 14 pt.
 - c. Select the range **A2:H2** and merge the date.

- d. Select both of the newly-merged cells (**A1:A2**), and bold them.
19. We notice that many of our headings in row 4 are more than one word. Select the range **A4:H4** and select **Home** » **Wrap Text**, then bold and center these headings.
20. Now let's format all those numbers so we can actually make sense of them:
 - a. Select the range **B6:B11** and apply the Accounting number format.
 - b. We'd also like to apply this format to the values in columns **D**, **F**, and **G**, so select **D6:D11**, then press and hold **Ctrl** while you select **F6:G11**. Then apply the Accounting number format to these cells.

Note: Holding down **Ctrl** is how you can select nonadjacent ranges of cells. You can't copy and paste nonadjacent ranges, but it's great for quick formatting! Of course, our friend the Format Painter, which we used to copy character and paragraph formatting in Word, will also copy number formats in Excel. Pretty neat!
 - c. Use this method to apply the Percentage number format to ranges **C6:C11**, **E6:E11**, and **H6:H11**.
 - d. Select **C6:C11** and **H6:H11** and click "Increase Decimal" (in the **Home** » **Number** group) twice to display these values to the hundredth of a percent.
 - e. Select the date in cell **A2** and enter the Number dialog box. Select from the "Date" category the format "**March 14, 2001**". Notice that the date now reads "February 6, 2013", even though you entered "2/6/2013".
21. Select the range **A4:H4**. Click the fill color arrow in the **Home** » **Font** group and select "Purple, Accent 4, Lighter 60%".
22. Select the range **E4:F11**. Click the border arrow and select "Thick Box Border".
23. Now let's indent our product names from the subheadings they're under. Select **A6:A8** and **A10:A11**, and click "Increase Indent" in the **Home** » **Alignment** group. Note that a keyboard shortcut for this is **Ctrl** + **Alt** + **Tab**.
24. Finally, let's name this worksheet in our workbook "**February 2013 Pricing**". Then apply the "Red, Accent 2" color to the worksheet tab and delete *Sheet2* and *Sheet3*.
25. Save all changes to your workbook.

Submission

To receive credit for these exercises, call over the instructor, who will check that you have completed the assignment. Then, log into CourseWeb and use the "Assignment Submission" section to submit your "**pricing.xlsx**" file for **Lab 3**.

You should be able to complete this lab in the allotted class time; however, if you are running low on time, the instructor will give you further instructions for completing the rest of this lab at home.

Your lab must be checked by the instructor BEFORE you leave the room AND you must submit your files to CourseWeb in order to receive credit for the lab! Don't forget!