Excel 2010 Advanced Features

Pivot tables
A pivot table breaks down and summarizes a large amount of data. It gives the user the ability to easily rearrange, or pivot, the data displayed. Open the pivot table practice workbook. This is a spreadsheet detailing Amazon affiliate income. Data is organized by product line, item name, ASIN, seller, date shipped, price, referral fee rate, items shipped, revenue, referral fees, and URL. A pivot table helps the user analyze this large amount of data by category.

To create a pivot table, click on the top left (Product Line) cell. Click on Insert, then on PivotTable. Table1 is automatically selected as the range. The default is for the PivotTable to be placed in a new worksheet. Leave these settings as they are and click on OK.

Notice the PivotTable Field List at the right. Any field in the list may be dragged to one of the four areas at the bottom of the same window. In this case, we want to break down quarterly revenue by product line. Drag the Product Line field into the Row Labels area. The list of product lines populates the rows of the pivot table. Next, drag Revenue into the Values area. Now the total revenue for each product line displays. To break that down into quarterly figures, drag Quarter into the Column Labels area.

Great! We got what we wanted, but the formatting could use some work. Right click on any of the quarterly or grand total numbers, and then click on Number Format. Next, click on Currency and then click on OK. Now all the numbers are displayed consistently with two decimal places and a dollar sign.

Let’s make this pivot table do a little more work for us. We want to be able to see the items sold under each product line and we want to compare Amazon.com sales to third party sales. First, drag Item Name into the Row Labels area, below Product Line. Now each product line’s sales are broken down by item. Use the minus icon at the left of each product line to collapse each category as you wish. Next, drag Seller into the Report Filter area. Now you can use the dropdown at the top of the pivot table to toggle between Amazon.com sales, third party sales and all sales. You may continue to manipulate the data using the PivotTable Field List.
You also have the option to insert a PivotChart based on the data in your PivotTable. Before you do this, remove Item Name from the pivot table (click on the down arrow next to Item Name in the Row Labels area, then click on Remove Field.) To create the pivot chart, make sure you are in the Options section of the PivotTable Tools area in the ribbon. Click on PivotChart. Choose the type of chart you prefer and click OK. Notice that you can rearrange the data displayed on the chart using dropdown menus on the chart, similarly to the way you can rearrange data in the pivot table.

**IF Formulas**

Now that we have seen how pivot tables and 3D sums enable us to get a different picture of our data, let’s use Amazon affiliate income to learn how we can use formulas to quickly deduce things from large amounts of data. Open the IF formulas practice workbook.

Now let’s say that we are interested in which items shipped for free from Amazon. Customers qualified for free shipping in 2009 if the price of their item exceeded $25. We could probably go from row to row, check the price under column “G”, and enter data in the “Free Shipping” column next to URL, but that would take hours to do by hand! Let’s simplify this task by using an IF formula.

An **IF formula** is a logic statement that tells Excel if a statement is true do A, and if it isn’t true do B:

=IF(logical_test, [value_if_true], [value_if_false])

In this case, we will have the formula look at the price and put down “YES” in the column “Free Shipping?” if the value is greater than or equal to $25, and do nothing if the price is less than $25. Enter this formula in cell M2:

=IF(G2>=25,"YES","")

Fill down the formula to apply to the rest of column M by clicking and dragging on the bottom right corner of cell M2.

But what if we want to locate items that were shipped for free and that were sold by a third party? We need to combine two IF formulas: one testing if the price in column G is less than
or equal to $25, and the other testing if the seller in column D was a third party. To do this, we need to use an AND formula.

An **AND formula** embeds into the IF formula to include up to 30 logical tests:

\[
=\text{IF(AND(condition1, [condition2]..., [value if true], [value if false])}
\]

Enter this formula in cell N2:

\[
=\text{IF(AND($G2>=25,$D2="Third Party"),"YES","")}
\]

Fill down the formula to apply to the rest of column N.

**Conditional formatting**

Let’s say you have a large set of data and rather than manipulating it, you want to highlight portions of the data that meet certain conditions. Conditional formatting can help. Open the conditional formatting practice workbook. This shows batting statistics for the 2015 MLB season. We can use conditional formatting to call out specific parts of the data. We want to know who had more RBI than the league average. First, click on the letter K above the RBI column to select that data. Under the Home ribbon, click on Conditional Formatting. Hover over Top/Bottom Rules and click on Above Average. This highlights cells in the RBI column that are above the average number in that column.

Since this data includes all MLB players, even if they only had a few at bats during 2015, you will notice that players with as few as 31 RBI are above the average. Let’s get a better idea of the players with the most RBI in the league last year. Click on the letter K again at the top of the RBI column. Click on Conditional Formatting. Hover over Top/Bottom Rules and click on Above Average. This highlights cells in the RBI column that are above the average number in that column.

Let’s try a more complex use of conditional formatting. First, click on Conditional Formatting. Hover over Clear Rules, then click on Clear Rules From Entire Sheet. This gives us a fresh start. Now we want to find any second baseman who had at least 100 at bats and a batting average of at least .250. Hit Ctrl+A to select all cells. When you have multiple conditions, or a condition that is not ready-made in the Conditional Formatting menu, click on New Rule under Conditional Formatting, then click on Use a formula to determine which cells to format.
In this case, an AND formula will do the job. Type in the following in the field under Format values where this formula is true:

$$=\text{AND}($B1="2B", $E1>99, $P1>0.249)$$

Formulas always begin with the = sign. $B1="2B"$ tells Excel to look for the text “2B” in column B. $E1>99$ tells Excel to look for values greater than 99 in column E. $P1>0.249$ tells Excel to look for values greater than 0.249 in column P. We need to enclose these in parentheses because they are all part of the same AND formula. Don’t forget to click on Format to select how you want the matches to be highlighted. Click on OK when you are finished. Any rows matching all three conditions will be highlighted.

**VLookup**

If you have a large set of data spread across multiple worksheets, VLookup can help you search for data in one worksheet and automatically fill it in elsewhere. VLookup has four components: lookup_value (what you are searching for), table_array (where are you searching?), col_index_num (which column should receive the search results), and [range_lookup] (are you looking only for exact matches or exact and partial matches?).

Let’s look at an example. You work in human resources and have a workbook with employees’ timesheets and their hourly rates. On the first worksheet, you have the employees’ names followed by the number of hours they worked. On the next worksheet, you have the employees’ names followed by their hourly rate.

Instead of flipping between the two worksheets to fill in the hourly rate on the first worksheet, we can use VLookup to do this work for us. First click on cell C2. This is where we want to begin filling in the hourly rates of the employees.
Click on the function button, just to the left of the formula bar ( fn ). Select VLookup and click on OK. You should see this dialog box:

Let’s start with the **lookup value**. In this case, we are searching for the first employee’s name. Since this is in cell A2 of the first worksheet, A2 is the lookup value. You can either type this in or click on cell A2 and it will fill in the dialog box. The **table array** tells Excel where we want to search. We want Excel to search in the Hourly Pay worksheet for the employee’s name and the pay rate. Click on the Hourly Pay spreadsheet. Then, select cells by clicking and dragging across from top left to bottom right. We want all the values in columns A and B covered, and it is not a bad idea to select some of the blank cells below. This way, if more data is added, the formula will still search those cells. So, click on cell A2 and drag down to cell B21. The **column index number** is how you tell Excel where you want the results to appear. Count the number of columns there are to get to your results, beginning with column B. In this case, we want our results to show up in column C. So, the column index number is 2. The **range lookup** can either be TRUE or FALSE. TRUE would mean partial results are acceptable, while FALSE means we only want exact results. In this case, we only want exact matches, so type in FALSE. Click on OK. Cary Adams’ hourly rate should appear in cell C2. When you click on cell C2, you should see the following formula in the formula bar:

=VLOOKUP(A2,'Hourly Pay'!A2:B21,2,FALSE)

We can quickly apply this formula to the rest of column C by filling down from cell C2. Click on cell C2, then click and drag down from the dot at the bottom right corner. Drag down to cell C21, or as far as you would like. When you release, the rest of the employees’ hourly rates appear.

Questions? Contact Adult Services at askref@elmwoodparklibrary.org or 708-395-1217.