Advanced Formatting and Functions

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Flash Fill

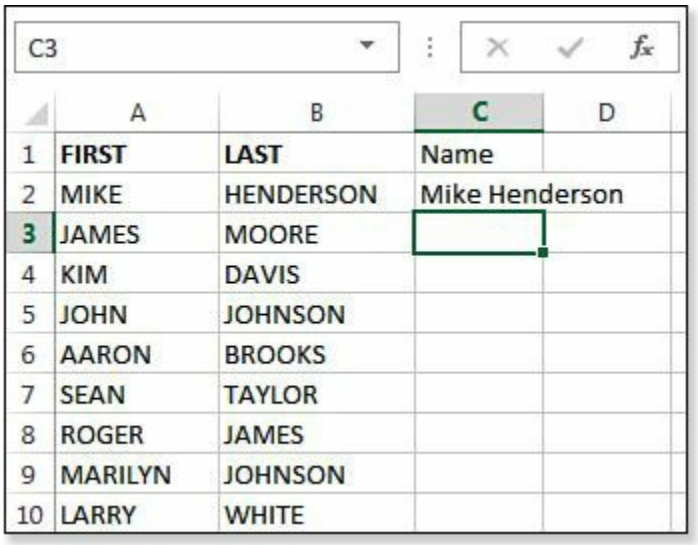
The Flash Fill feature in Excel 2013 saves you time when you are trying to reshape imperfect data. Many times, you get data from somewhere that isn't in the right format—the text is all caps, phone numbers appear without dashes, or a bunch of fields are jammed into a single column. By providing one or two examples of what you are trying to do, Flash Fill uses heuristics to make a correction of the data in an adjoining column.

Cleaning Data with Flash Fil

Let's assume that you have a file with first names in column A and last names in column B. The names are in uppercase. You would like to reshape the data, so you have the full names in proper case.

If you have been using Excel for many years, you might instinctively think of the formula:

=PROPER(A2&" "&B2). Enter that formula in C2, copy down, copy, and paste values to solve the problem. Unfortunately, far too many people think that formula is too intimidating, and start simply typing the new data, as shown in the figure below.



	A	B	C	D
1	FIRST	LAST	Name	
2	MIKE	HENDERSON	Mike Henderson	
3	JAMES	MOORE		
4	KIM	DAVIS		
5	JOHN	JOHNSON		
6	AARON	BROOKS		
7	SEAN	TAYLOR		
8	ROGER	JAMES		
9	MARILYN	JOHNSON		
10	LARRY	WHITE		

In Excel 2013, and later, as soon as you type the first letter in the second cell, Excel springs into action and offers to fill the rest of the column for you as shown in the figure below. If you are satisfied that the preview is correct or even close, simply press Enter.

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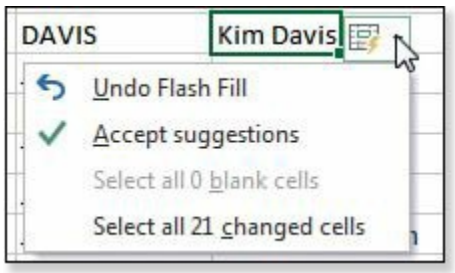
	A	B	C
1	FIRST	LAST	Name
2	MIKE	HENDERSON	Mike Hendersc
3	JAMES	MOORE	James Moore
4	KIM	DAVIS	Kim Davis
5	JOHN	JOHNSON	John John
6	AARON	BROOKS	Aaron Bro
7	SEAN	TAYLOR	Sean Tayl
8	ROGER	JAMES	Roger Jam
9	MARILYN	JOHNSON	Marilyn Jo
10	LARRY	WHITE	Larry Whit
11	LORI	COLLINS	Lori Collin
12	CHRISTINE	LITTLE	Christine
13	DIANE	WILLIS	Diane Wil
14	STEVE	VASQUEZ	Steve Vas
15	DANIEL	RYAN	Daniel Ry
16	DIANA	CUNNINGHAM	Diana Cun
17	TAMMY	HICKS	Tammy Hi
18	GARY	ROMERO	Gary Rom
19	AMY	GARRETT	Amy Garre
20	LOUIS	GARRETT	Louis Garr
21	RANDY	WHEELER	Randy Wh
22	JAMES	HARRIS	James Har
23	GLORIA	BELL	Gloria Bel
24			

In addition to filling the column, Excel provides two pieces of feedback. First, the status bar in the lower-left corner of the screen indicates that Flash Fill changed 21 cells.

You can also choose to select all changed cells or all unchanged cells. You find out more about unchanged cells in the next section.



Excel easily recognizes all sorts of patterns. You could fill from “Mike”, “Mike H.”, or “HENDERSON, MIKE”. Sometimes, Excel needs a bit more information. If you start with Mr. Mike Henderson in C2, nothing happens when you start to type **M** in C3. You have to type Mr. James Moore in C3. As soon as you type **M** in C4, Excel fills the column. However, Excel blindly uses Mr. for Marilyn, Lori, and

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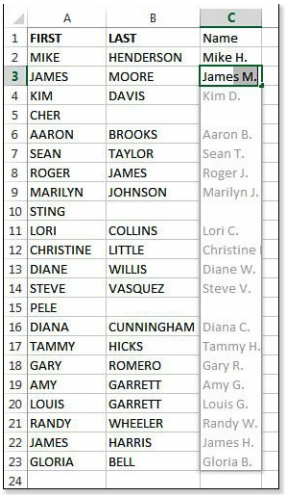
Christine so sometimes you will have to do a little extra work to correct the data.

Coaching Flash Fill with a Second Example

That first Flash Fill example works like a charm. However in the world of imperfect data, things are not always so clear. In this example we will use the data in the Names3 tab.

Type **Mike H.** in C2, and then type **J** in C3. Excel sees that you are doing first name, last initial, and a period. The preview shows many names being filled in, as shown in **Figure 12** - Cells Left Blank**.** However, the status bar indicates "Flash Fill Blank Cells: 3 Flash Fill Changed Cells: 18." When there is missing data, such as no last name for Cher, Excel leaves the cells blank as shown in the completed example below.



	A	B	C
1	FIRST	LAST	Name
2	MIKE	HENDERSON	Mike H.
3	JAMES	MOORE	James M.
4	KIM	DAVIS	Kim D.
5	CHER		
6	AARON	BROOKS	Aaron B.
7	SEAN	TAYLOR	Sean T.
8	ROGER	JAMES	Roger J.
9	MARILYN	JOHNSON	Marilyn J.
10	STING		
11	LORI	COLLINS	Lori C.
12	CHRISTINE	LITTLE	Christine
13	DIANE	WILLIS	Diane W.
14	STEVE	VASQUEZ	Steve V.
15	PELE		
16	DIANA	CUNNINGHAM	Diana C.
17	TAMMY	HICKS	Tammy H.
18	GARY	ROMERO	Gary R.
19	AMY	GARRETT	Amy G.
20	LOUIS	GARRETT	Louis G.
21	RANDY	WHEELER	Randy W.
22	JAMES	HARRIS	James H.
23	GLORIA	BELL	Gloria B.
24			

C4

	A	B	C	D
1	FIRST	LAST	Name	
2	MIKE	HENDERSON	Mike H.	
3	JAMES	MOORE	James M.	
4	KIM	DAVIS	Kim D.	
5	CHER			
6	AARON	BROOKS	Aaron B.	
7	SEAN	TAYLOR	Sean T.	
8	ROGER	JAMES	Roger J.	
9	MARILYN	JOHNSON	Marilyn J.	
10	STING			
11	LORI	COLLINS	Lori C.	
12	CHRISTINE	LITTLE	Christine L.	
13	DIANE	WILLIS	Diane W.	
14	STEVE	VASQUEZ	Steve V.	
15	PELE			
16	DIANA	CUNNINGHAM	Diana C.	

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At this point you need to provide Excel with a second example. Go to cell C5, type **Cher**, and press Enter. Excel now understands the rule for people without a last name. Excel fills in Sting in C10 and Pele in C15, as shown in**Figure 14** - Providing a Second Example. The status bar indicates "Flash Fill Changed Cells: 2." Those two cells are automatically selected.

5	CHER		Cher
6	AARON	BROOKS	Aaron B.
7	SEAN	TAYLOR	Sean T.
8	ROGER	JAMES	Roger J.
9	MARILYN	JOHNSON	Marilyn J.
10	STING		Sting
11	LORI	COLLINS	Lori C.
12	CHRISTINE	LITTLE	Christine L.
13	DIANE	WILLIS	Diane W.
14	STEVE	VASQUEZ	Steve V.
15	PELE		Pele
16	DIANA	CUNNINGHAM	Diana C.
17	TAMMY	HICKS	Tammy H.
18	GARY	ROMERO	Gary R.
19	AMY	GARRETT	Amy G.
20	LOUIS	GARRETT	Louis G.
21	RANDY	WHEELER	Randy W.
22	JAMES	HARRIS	James H.
23	GLORIA	BELL	Gloria B.

Inserting New Characters in a Telephone Number

Flash Fill works great when you are formatting a telephone number. Open the Phone tab for this example. In **Figure 15** - Formatting a Phone Number the 10-digit phone numbers appear without parentheses or dashes in column B.

We want to format the telephone numbers with a parenthesis around the area code and a dash in the telephone number.

Insert a new column C. Type a heading in C1. Retype the first phone number in C2 as **(907) 555- 2750**. As soon as you type the opening parenthesis in C3, Flash Fill offers to fill in the rest of the column (see **Figure 15** - Formatting a Phone Number).

Note that the new values are static values. They are not formulas. After Flash Fill works, you are free to delete the original column without having to worry about the new column changing to #REF errors.

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	A	B	C	D	E
1	NAME	PHONE	Telephone	LOCATION	DOB
2	KATHERINE BOWMAN	9075557250	(907) 555-7250	FAIRBANKS AK	19700305
3	CHARLES JONES	2055558215	(205) 555-8215	BIRMINGHAM AL	19501110
4	AMANDA FULLER	7025552947	(702) 555-2947	LAS VEGAS NV	19740327
5	LOUISE BAKER	3045557379	(304) 555-7379	WHEELING WV	19520623
6	CONNIE LANE	4845558146	(484) 555-8146	ALLENTOWN PA	19771102
7	DORIS CHAVEZ	8135553692	(813) 555-3692	TAMPA FL	19511106
8	JUDITH JOHNSON	6175552712	(617) 555-2712	BOSTON MA	19670913
9	VICTOR ARNOLD	8475555865	(847) 555-5865	NORTHBROOK IL	19821005
10	RAY MOORE	6025558659	(602) 555-8659	PHOENIX AZ	19640919
11	JEAN MURRAY	3145558149	(314) 555-8149	ST. LOUIS MO	19420312
12	JASON MOORE	8725554158	(872) 555-4158	CHICAGO IL	19621113
13	JOSEPHINE DANIELS	3305557448	(330) 555-7448	AKRON OH	19721104
14	RITA KNIGHT	6265555727	(626) 555-5727	PASADENA CA	19461203
15	PHYLLIS JOHNSON	2015559379	(201) 555-9379	HACKENSACK NJ	19421209
16	CAROL CHAPMAN	6825553875	(682) 555-3875	FORT WORTH TX	19481021
17	ALAN RODRIGUEZ	4025555209	(402) 555-5209	LINCOLN NE	19521003
18	ALBERT DANIELS	3055551928	(305) 555-1928	MARATHON FL	19520911
19	EVELYN TORRES	3215552157	(321) 555-2157	COCOA BEACH FL	19490817

Using Commas Helps Flash Fill

In this example I am using the data in the ADDR1 tab. A comma is being used in column C to separate the city and state. When there is a comma, the Flash Fill in column D works perfectly to get the city every time as shown in the figure below.

	A	B	C	D
1	NAME	PHONE	LOCATION	City
2	KATHERINE BOWMAN	9075557250	FAIRBANKS, AK	Fairbanks
3	CHARLES JONES	2055558215	BIRMINGHAM, AL	Birmingham
4	AMANDA FULLER	7025552947	LAS VEGAS, NV	Las Vegas
5	LOUISE BAKER	3045557379	WHEELING, WV	Wheeling
6	CONNIE LANE	4845558146	ALLENTOWN, PA	Allentown
7	DORIS CHAVEZ	8135553692	TAMPA, FL	Tampa
8	JUDITH JOHNSON	6175552712	BOSTON, MA	Boston
9	VICTOR ARNOLD	8475555865	NORTHBROOK, IL	Northbrook
10	RAY MOORE	6025558659	PHOENIX, AZ	Phoenix
11	JEAN MURRAY	3145558149	ST. LOUIS, MO	St. Louis
12	JASON MOORE	8725554158	CHICAGO, IL	Chicago
13	JOSEPHINE DANIELS	3305557448	AKRON, OH	Akron
14	RITA KNIGHT	6265555727	PASADENA, CA	Pasadena
15	PHYLLIS JOHNSON	2015559379	HACKENSACK, NJ	Hackensack
16	CAROL CHAPMAN	6825553875	FORT WORTH, TX	Fort Worth

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But in real life, bad data isn't pretty. If the city and state are in a column without a comma between you have a problem. That is the case with the data in the ADDR2 tab. With this situation Flash Fill doesn't work perfectly this first time around' It only picks up the first part of a city that has two words like Las Vegas.

D	E	F
LOCATION	DOB	City
FAIRBANKS AK	19700305	Fairbanks
BIRMINGHAM AL	19501110	Birmingham
LAS VEGAS NV	19740327	Las
WHEELING WV	19520623	Wheeling
ALLENTOWN PA	19771102	Allentown
TAMPA FL	19511106	Tampa
BOSTON MA	19670913	Boston
NORTHBROOK IL	19821005	Northbrook
PHOENIX AZ	19640919	Phoenix
ST. LOUIS MO	19420312	St
CHICAGO IL	19621113	Chicago
AKRON OH	19721104	Akron
PASADENA CA	19461203	Pasadena
HACKENSACK NJ	19421209	Hackensack
FORT WORTH TX	19481021	Fort
LINCOLN NE	19521003	Lincoln
MARATHON FL	19520911	Marathon
COCOA BEACH FL	19490817	Cocoa

To solve this problem type **Fairbanks** in D2 and then type **B** from Birmingham in D3. Flash fill goes to work and fills in all of the cells for you. This problem is a bit more insidious because there aren't any blank cells to make you realize that it did not work. Luckily, the problems are showing up in the first part of the data, so you might notice the Las in D4. However, I can certainly foresee a situation where you have 9,000 records that say Henderson a n d only five records that say Las Vegas, and those latter records don't start until row 8642. In such a case, it would be really tough to realize that there is a problem.

Assuming you notice the problem, Excel can recover for you. Go to the first cell that is wrong in the Flash Fill results and type the correct value. Type **Las Vegas** in F4. Excel then fills in St. Louis, Fort Worth, and Cocoa Beach

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D	E	F	G
LOCATION	DOB	City	
FAIRBANKS AK	19700305	Fairbanks	
BIRMINGHAM AL	19501110	Birmingham	
LAS VEGAS NV	19740327	Las Vegas	
WHEELING WV	19520623	Wheeling	
ALLENTOWN PA	19771102	Allentown	
TAMPA FL	19511106	Tampa	
BOSTON MA	19670913	Boston	
NORTHBROOK IL	19821005	Northbrook	
PHOENIX AZ	19640919	Phoenix	
ST. LOUIS MO	19420312	St. Louis	
CHICAGO IL	19621113	Chicago	
AKRON OH	19721104	Akron	
PASADENA CA	19461203	Pasadena	
HACKENSACK NJ	19421209	Hackensack	
FORT WORTH TX	19481021	Fort Worth	
LINCOLN NE	19521003	Lincoln	
MARATHON FL	19520911	Marathon	
COCOA BEACH FL	19490817	Cocoa Beach	

Fuzzy Lookup

Fuzzy Lookup is a recent addition to Excel that allows you to match data that is close but not exact. If you have two lists of employee names, as an example, and you are trying to see if any of the employees on the first list also appears on the second, Excel is a great tool to utilize by using functions such as MATCH or VLOOKUP. What if the same employee appears on one list as "Steven Jenkins," and on the other as "Steve Jenkins"? The effort to match would fail. It would, however, work if you were using Fuzzy Lookup.

Obtaining and Installing Fuzzy Lookup

Fuzzy Lookup is a free add-in available from Microsoft at the following URL: http://www.microsoft.com/en-us/download/details.aspx?id=15011 . The setup file for Fuzzy Lookup is to be found in the Teaching File folder. The installation file is only 1.5 megabytes in size and generally takes only a few seconds to download. However, since this is just an installation file, more content is added to your computer during the installation process. Once the download completes, double-click the file, which is appropriately named **FuzzyLookupForExcel.zip** to show it in uncompressed form. Next, double-click **Setup.exe** to start the install process. Read the **End User Licensing Agreement** (EULA) and select **Accept**. Follow the on screen prompts to complete the installation.

Once it finishes, start Excel; you should now see a new tab on the ribbon labeled **Fuzzy Lookup**. If you do not, click on the **File** tab and choose **Options**. Next, select **Add-ins** from the left pane of the **Excel Options** dialog box. Then, from the **Manage:** drop-down list, choose **COM Add- ins** and then press **Go**. You will see the **COM Add-Ins** dialog box shown in the figure below. Make sure that a checkmark appears in the box next to Fuzzy Lookup Add-In for Excel and then click **OK**.

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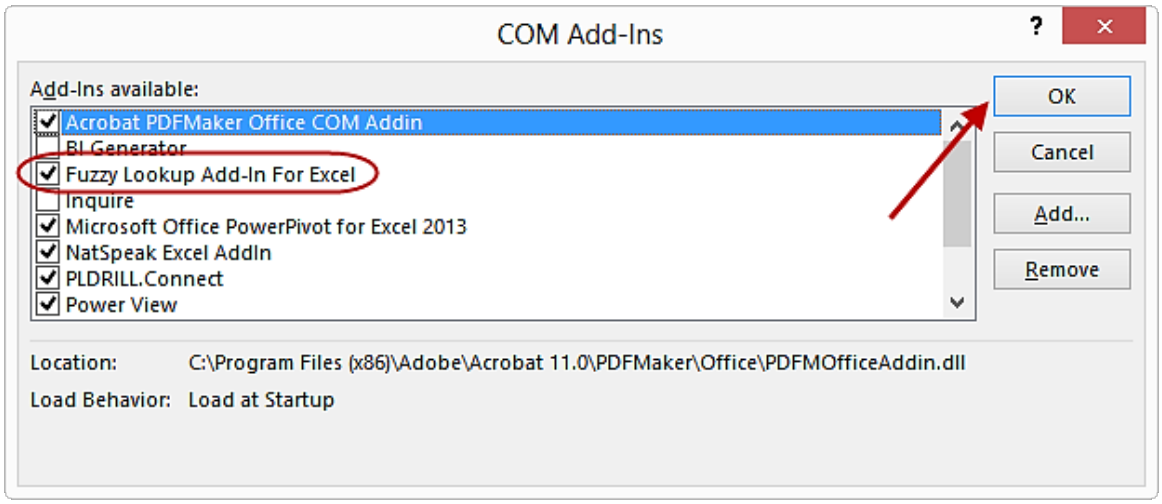

Using Fuzzy Lookup

The Fuzzy Lookup Add-in matches inexact textual data and allows you to join data from multiple tables into one based on these matches. This being the case, the first step in the process is to make sure that the data you are comparing is resident in tables. If it is not, convert the ranges to tables by placing the cursor in the data range and holding down the **Control Key** (Ctrl) on your keyboard and then pressing the letter "T."

The table below presents two tables we will use for the basis of our Fuzzy Lookup. ***SSN*** is the name of the table on the left, and ***Comp*** is the name of the table on the right. We would like to match the *Name* field in SSN to the *Name* field in Comp and create a results list that shows employees' names, Social Security numbers, and compensation.

The challenge we face is that not all of the names are spelled and arranged the same way; therefore, if we attempt to use a VLOOKUP function to complete this task, we will not be successful. For example, consider the name *Jan Kotas* on row 4 of SSN. In looking at row 8 of Comp, we see that what should be the matching name is arranged as *Kotas, Jan*; thus, a VLOOKUP function would not match the two names together. Likewise, *Robert Zare* on row 8 and *Thomas Axen* on row 13 of SSN are not exact matches to *Robert Zare, III* on row 11 and *T G Axen* on row 17 of Comp, again presenting problems if we try to match based on traditional methods.

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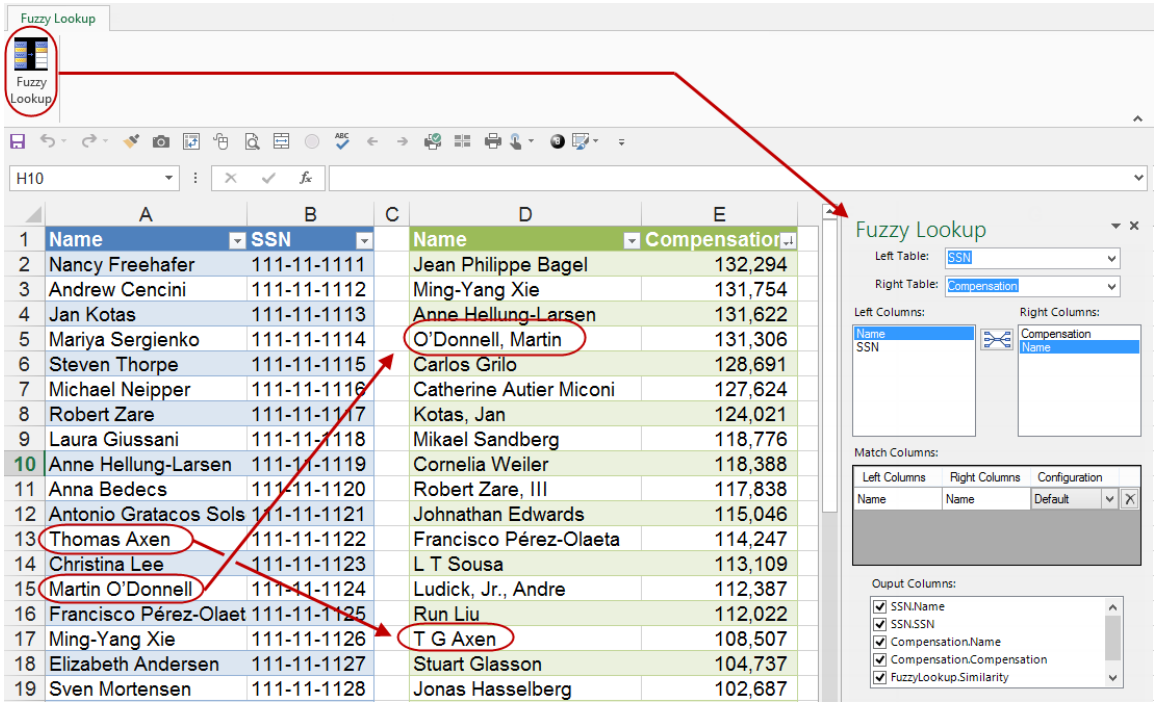

	A	B	C	D	E
1	Name	SSN		Name	Compensation
2	Nancy Freehafer	111-11-1111		Jean Philippe Bagel	132,294
3	Andrew Cencini	111-11-1112		Ming-Yang Xie	131,754
4	Jan Kotas	111-11-1113		Anne Hellung-Larsen	131,622
5	Mariya Sergienko	111-11-1114		O'Donnell, Martin	131,306
6	Steven Thorpe	111-11-1115		Carlos Grilo	128,691
7	Michael Neipper	111-11-1116		Catherine Autier Miconi	127,624
8	Robert Zare	111-11-1117		Kotas, Jan	124,021
9	Laura Giussani	111-11-1118		Mikael Sandberg	118,776
10	Anne Hellung-Larsen	111-11-1119		Cornelia Weiler	118,388
11	Anna Bedecs	111-11-1120		Robert Zare, III	117,838
12	Antonio Gratacos Sols	111-11-1121		Johnathan Edwards	115,046
13	Thomas Axen	111-11-1122		Francisco Pérez-Olaeta	114,247
14	Christina Lee	111-11-1123		L T Sousa	113,109
15	Martin O'Donnell	111-11-1124		Ludick, Jr., Andre	112,387
16	Francisco Pérez-Olaet	111-11-1125		Run Liu	112,022
17	Ming-Yang Xie	111-11-1126		T G Axen	108,507
18	Elizabeth Andersen	111-11-1127		Stuart Glasson	104,737
19	Sven Mortensen	111-11-1128		Jonas Hasselberg	102,687

However, we can match the data in these two tables using the Fuzzy Lookup Add-in. Position your cursor in the cell where you want the results to appear. Then click **Fuzzy Lookup** on the **Fuzzy Lookup** tab of the Ribbon to open the Fuzzy Lookup task pane on the right side of the window shown in the table above. Upon doing so, Excel automatically senses and inserts the names of the tables into the Fuzzy Lookup task pane. Excel also automatically analyzes the columns in the tables and joins the tables if a column in one table has the same column header as a column in the other table. Of course, you can edit both the table and column selections, if necessary.

In the **Output Columns** section, check the box next to each field you want included in your results list. In this example, we are indicating that we want the Name and SSN fields from the SSN table and the Compensation field from the Compensation table to be included in the output. We are also indicating that we want the system-generated *Similarity* score to be included. The Similarity score provides a measure of how "confident" Excel is in its matching of inexact data. With these processes complete, all that is left to do is click **Go**.

Upon doing so, the Fuzzy Lookup Add-in analyzes the data in the two tables and provides the results list .

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Name	SSN	Name	Compensation	Similarity
Nancy Freehafer	111-11-1111	Nancy A Freehafer	73977	0.9455
Andrew Cencini	111-11-1112	Andrew Cencini, Jr.	70353	0.9455
Jan Kotas	111-11-1113	Kotas, Jan	124021	1.0000
Mariya Sergienko	111-11-1114			
Steven Thorpe	111-11-1115	Thorpe, Steven G.	79014	0.9455
Michael Neipper	111-11-1116	Michael Neipper	78288	1.0000
Robert Zare	111-11-1117	Robert Zare, III	117838	0.9333
Laura Giussani	111-11-1118	Laura Giussani	93669	1.0000
Anne Hellung-Larsen	111-11-1119	Anne Hellung-Larsen	131622	1.0000
Anna Bedecs	111-11-1120	Bedecs, Anna	80582	1.0000
Antonio Gratacos Solsona	111-11-1121	Antonio Gratacos Solsona	66270	1.0000
Thomas Axen	111-11-1122			
Christina Lee	111-11-1123	Christina Lee	85886	1.0000
Martin O'Donnell	111-11-1124	O'Donnell, Martin	131306	1.0000

A close inspection of the data in the figure above reveals that the tool worked well, though not flawlessly. In particular, it did not find matches for Mariya Sergienko and Thomas Axen. Returning to the Fuzzy Lookup task pane, let us modify the **Similarity Threshold** setting to see if reducing the confidence level slightly increases the number of matches. To do this, drag the Zoom Slider to the left so that a smaller value – in this case, 0.4 – is in place. Once this is done, a greater number of matches occur as shown in the figure below.

Name	SSN	Name	Compensatio	Similarity
Nancy Freehafer	111-11-1111	Nancy A Freehafer	73977	0.9455
Andrew Cencini	111-11-1112	Andrew Cencini, Jr.	70353	0.9455
Jan Kotas	111-11-1113	Kotas, Jan	124021	1.0000
Mariya Sergienko	111-11-1114	M Sergienko	70211	0.4615
Steven Thorpe	111-11-1115	Thorpe, Steven G.	79014	0.9455
Michael Neipper	111-11-1116	Michael Neipper	78288	1.0000
Robert Zare	111-11-1117	Robert Zare, III	117838	0.9333
Laura Giussani	111-11-1118	Laura Giussani	93669	1.0000
Anne Hellung-Larsen	111-11-1119	Anne Hellung-Larsen	131622	1.0000
Anna Bedecs	111-11-1120	Bedecs, Anna	80582	1.0000
Antonio Gratacos Solsona	111-11-1121	Antonio Gratacos Solsona	66270	1.0000
Thomas Axen	111-11-1122	T G Axen	108507	0.4089
Christina Lee	111-11-1123	Christina Lee	85886	1.0000
Martin O'Donnell	111-11-1124	O'Donnell, Martin	131306	1.0000
Francisco Pérez-Olaeta	111-11-1125	Francisco Pérez-Olaeta	114247	1.0000
Ming-Yang Xie	111-11-1126	Ming-Yang Xie	131754	1.0000

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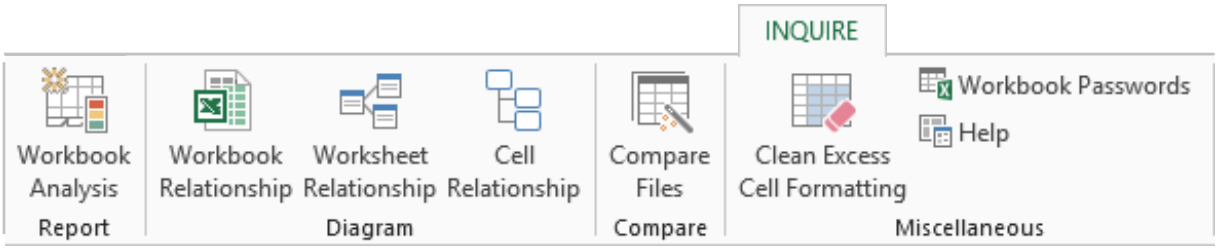
Inquire

Inquire is a Microsoft add-in for Excel 2013 and beyondthat allows users to compare versions of a workbook, check workbooks for problems and inconsistencies, and identify links between workbooks or worksheets. In a nutshell, Inquire allows users to analyze, review, audit, and document their workbooks. By using Inquire, users will better understand the design and function of their workbooks, along with potential errors, data dependencies, and security concerns.

If the INQUIRE tab does not appear in the ribbon, enable the add-in in Excel. Click File, Options, Add-ins, select COM Add-ins in the Manage box in the pane on the right, and then click Go. Check Inquire in the COM Add-ins dialog box and click OK to enable the add-in, which will now appear in the ribbon, as shown in the figure below.



The primary means of analyses available in Inquire are 1) a tool to analyze workbooks and provide textual summary reports, 2) tools to identify and provide a graphical map of relationships among workbooks, worksheets, and cells, 3) a link to Spreadsheet Compare (a separate application that is included with Office 2013 Professional Plus) for comparing workbook files, 4) a tool to remove excess formatting from empty cells in worksheets or workbooks, and 5) a password manager to ease the burden of analyzing password-protected files. The Inquire tools can be used in conjunction with or as a supplement to the formula auditing and evaluation tools available in all versions of Excel.

Workbook Analysis produces a comprehensive analysis of the workbook, sheet by sheet and cell by cell. The Summary section identifies any linked workbooks or data connections used by the workbook, provides a history of the file (author, creation date, last modification date), and identifies the number of hidden and unhidden sheets. Other sections comprehensively document formulas, cells, ranges, and warnings. Check any areas for which additional scrutiny is desired, such as formulas with errors or the workbook summary, and then click the Excel Export button to export the details to a separate analysis workbook. Click Load Export File to open the analysis workbook, which contains the selected details and a column for reviewer comments, as shown in the Excel file *Inquire – Workbook Analysis Report.xlsx*. For complete and comprehensive documentation of a workbook, check Items in the Workbook Analysis Report before exporting it to Excel.

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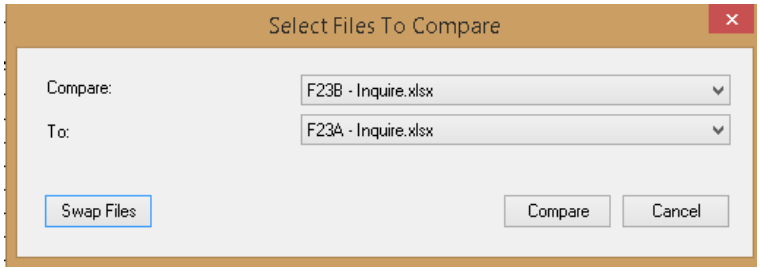
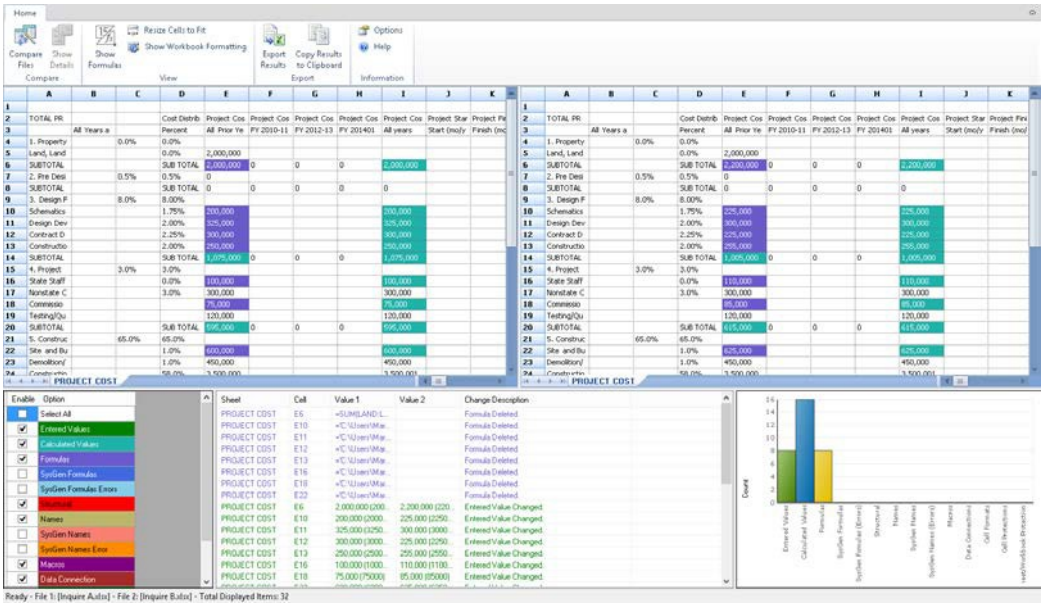
Workbook Relationship produces a graphical map of all other workbooks to which the current workbook links. Likewise, Worksheet Relationship provides a graphical map of all other worksheets to which the currently active worksheet links. Cell Relationship allows users to visualize how other cells and ranges link to the currently selected cell.

Compare Files

The **Compare Files** feature provides a feature that has long been sought by many users. With **Compare Files**, you can electronically compare two workbooks and instantly identify all differences between the compared workbooks. To use **Compare Files**, begin by opening the two workbooks you want to compare. (*In our example the files are named are named F23A – Inquire and F23B – Inquire)* Then, choose **Compare Files** from the **Inquire** tab of the Ribbon and select the two workbooks you want to compare, as shown below in **Figure 23A**.



Upon clicking **Compare** in the lower right corner of the **Select Files To Compare** dialog box, Excel analyzes the two workbooks and generates a detailed analysis that highlights differences in data, formulas, formatting, and other characteristics. The figure below presents a sample of that analysis.



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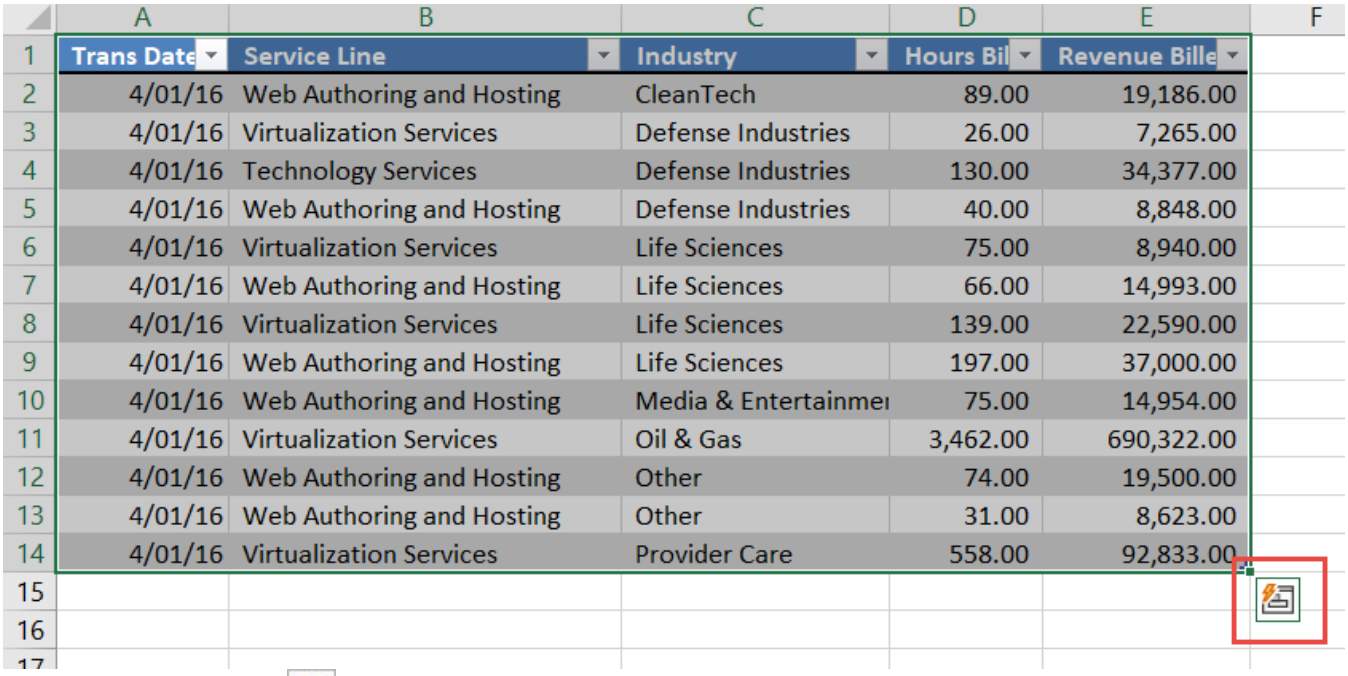
Clean Excess Cell Formatting provides users with a tool to clean unwanted formatting from blank cells, which is a common cause of bloated files and poor performance.

Lastly, the **Workbook Passwords** feature is used to save workbook passwords. This relieves users of having to log in to password-encrypted linked files when running an analysis or file comparison in Inquire.

How to Use the Quick Analysis Tool in Microsoft Excel

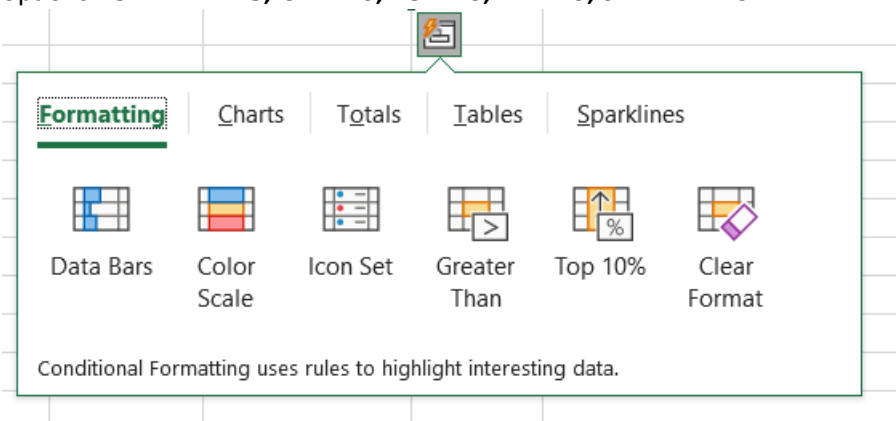
In Microsoft Excel 2013 and beyond, the **Quick Analysis** tool makes it possible to analyze your data quickly and easily using different Excel tools. You can use **Quick Analysis** with a range or a table of data. To access **Quick Access** tool, select the cells that contain the data you want to analyze. The **Quick Analysis** tool button appears at the bottom right of your selected data.

1. Select the cells of data that you want to analyze.



	A	B	C	D	E
1	Trans Date	Service Line	Industry	Hours Bil	Revenue Bille
2	4/01/16	Web Authoring and Hosting	CleanTech	89.00	19,186.00
3	4/01/16	Virtualization Services	Defense Industries	26.00	7,265.00
4	4/01/16	Technology Services	Defense Industries	130.00	34,377.00
5	4/01/16	Web Authoring and Hosting	Defense Industries	40.00	8,848.00
6	4/01/16	Virtualization Services	Life Sciences	75.00	8,940.00
7	4/01/16	Web Authoring and Hosting	Life Sciences	66.00	14,993.00
8	4/01/16	Virtualization Services	Life Sciences	139.00	22,590.00
9	4/01/16	Web Authoring and Hosting	Life Sciences	197.00	37,000.00
10	4/01/16	Web Authoring and Hosting	Media & Entertainmei	75.00	14,954.00
11	4/01/16	Virtualization Services	Oil & Gas	3,462.00	690,322.00
12	4/01/16	Web Authoring and Hosting	Other	74.00	19,500.00
13	4/01/16	Web Authoring and Hosting	Other	31.00	8,623.00
14	4/01/16	Virtualization Services	Provider Care	558.00	92,833.00
15					
16					

2. Click the **Quick Analysis** button. The Quick Analysis toolbar appears with the options **FORMATTING, CHARTS, TOTALS, TABLES, SPARKLINES**.



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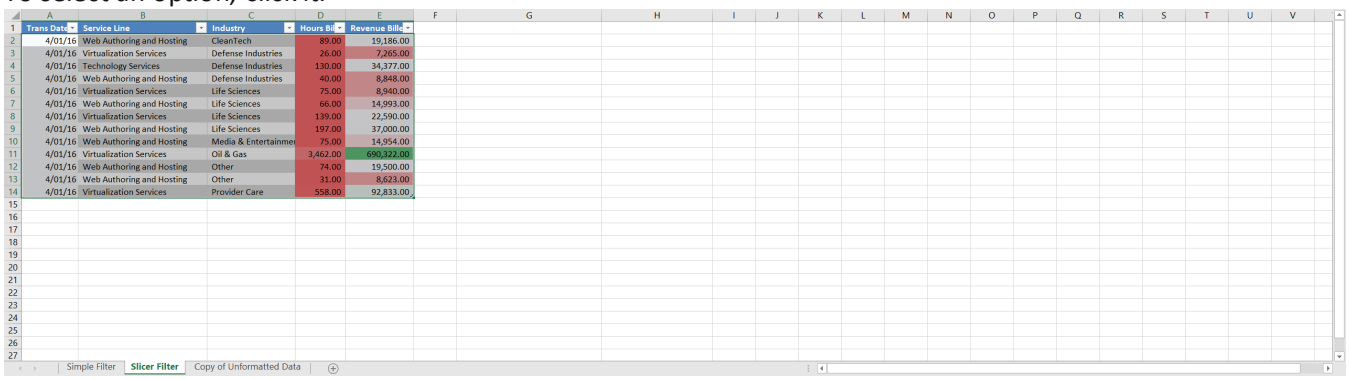
3. Roll over each option in the Quick Analysis gallery to see a preview.

4. To select an option, click it.



Trans Date	Service Line	Industry	Hours Bil	Revenue Bille
4/01/16	Web Authoring and Hosting	CleanTech	89.00	19,186.00
4/01/16	Virtualization Services	Defense Industries	26.00	7,265.00
4/01/16	Technology Services	Defense Industries	130.00	34,377.00
4/01/16	Web Authoring and Hosting	Defense Industries	40.00	8,848.00
4/01/16	Virtualization Services	Life Sciences	75.00	8,940.00
4/01/16	Web Authoring and Hosting	Life Sciences	66.00	14,993.00
4/01/16	Virtualization Services	Life Sciences	139.00	22,590.00
4/01/16	Web Authoring and Hosting	Life Sciences	197.00	37,000.00
4/01/16	Web Authoring and Hosting	Media & Entertainme	75.00	14,954.00
4/01/16	Virtualization Services	Oil & Gas	3,462.00	690,322.00
4/01/16	Web Authoring and Hosting	Other	74.00	19,500.00
4/01/16	Web Authoring and Hosting	Other	31.00	8,623.00
4/01/16	Virtualization Services	Provider Care	558.00	92,833.00

The Quick Analysis tool is handy and quick to use as you can also have a preview of applying different options, before selecting the one you want.

Conditional Formatting

Conditional formatting makes data easier to interpret because a cell's value controls the appearance of that cell. Conditional formats make analyzing data – spotting unusual observations, tracking trends, checking status, and finding top values – easier and more effective. These formats are called *conditional formats* because their application depends on whether the data meets the conditions you specify.
Conditional formatting has been a part of Excel functionality since Excel 97, but it has been enhanced greatly over the years. Five types of conditional formats are available to apply to a cell or to a range of cells.

- **Highlight Cells Rules** – Rules are created to highlight cells when some criteria are met. There are seven built-in rule types: Greater Than, Less Than, Between, Equal To, Text That Contains, A Date Occurring, and Duplicate Values.

- **Top/Bottom Rules** – Formatting is applied to a selected range of cells that are more or less than a given threshold. There are six built-in rule types: Top N Items, Top N %, Bottom N Items, Bottom N %, Above Average, and Below Average.

- **Data Bars** – This fills cells with gradient bars whose length is relative to all other values in the selected range. The color combinations available are dependent on the active theme.

- **Color Scales** – This fills cells with gradient colors using a two- or three-color scheme. The shades are relative to all other values in the selected range. The color combinations available are dependent on the active theme.

- **Icon Sets** – This fills the left-hand margin of cells with small graphic characters whose shape and color is relative to all other values in the selected range.

To apply conditional formatting to a cell or range of cells, highlight the cells and then select **Conditional Formatting** from the **Home** tab of the Ribbon. Select the conditional formatting type desired and fill out any additional dialogs to complete the process. Monthly sales greater than $30,000 or those less than $7,000 are highlighted. Two **Highlight Cells** rules produce the formatting.

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	Jan	Feb	Mar	Apr	May	Jun	Total
Creme, Aloe Vera Hand, 9 oz	$ 8,388	$ 9,087	$ 8,039	$ 8,388	$ 10,485	$ 12,582	$ 56,969
Creme, Extra Moisturizing Hand, 9 oz	8,988	9,737	8,614	8,988	11,235	13,482	61,044
Creme, Hand and Body, 16 oz	15,588	16,887	14,939	15,588	19,485	23,382	105,869
Lotion, Organic Body, 9 oz	9,588	10,387	9,189	9,588	11,985	14,382	65,119
Lotion, Organic Body, 16 oz	17,988	19,487	17,239	17,988	22,485	26,982	122,169
Lotion, Organic Body, 24 oz	26,388	28,587	25,289	26,388	32,985	39,582	179,219
Lotion, Extra Moisturizing Body, 9 oz	8,388	9,087	8,039	8,388	10,485	12,582	56,969
Lotion, Organic Hand and Body, 9 oz	10,188	11,037	9,764	10,188	12,735	15,282	69,194
Lotion, Organic Hand and Body, 16 oz	19,188	20,787	18,389	19,188	23,985	28,782	130,319
Mask, Organic Facial, 9 oz	16,788	18,187	16,089	16,788	20,985	25,182	114,019
Mask, Wrinkle Reducing Facial, 9 oz	22,788	24,687	21,839	22,788	28,485	34,182	154,769
Mask, Wrinkle Reducing Facial, 16 oz	5,399	4,679	4,139	4,319	5,399	6,478	30,413
Mask, Wrinkle Reducing Facial, 24 oz	8,099	7,019	6,209	6,479	8,099	9,718	45,623

As shown in Error! Reference source not found., multiple rules can be applied to the same range of cells. However, when a cell meets the criteria of more than one rule, the rule highest in the **Conditional Formatting Rules Manager** will prevail. As new conditional formatting rules are created, they are added to the top of the Rules Manager list. The Rules Manager provides a single place to manage all rules for a selected range, the active worksheet, or another sheet in the active workbook. To access the Rules Manager, select **Conditional Formatting, Manage Rules** from the **Home** tab of the Ribbon.

The second example uses the same data but applies **Color Scales** to the sales totals to help you understand the relative sales contribution of individual products as shown in the figure below. The detail columns have been hidden for presentation so that your focus is on total sales. In this case, the lowest sales volume is colored in red, the highest volume is colored in green, and the median value is colored in yellow. All other sales volumes are displayed in shades of these three colors to indicate their relative value.

	Total
Creme, Aloe Vera Hand, 9 oz	$ 56,969
Creme, Extra Moisturizing Hand, 9 oz	61,044
Creme, Hand and Body, 16 oz	105,869
Lotion, Organic Body, 9 oz	65,119
Lotion, Organic Body, 16 oz	122,169
Lotion, Organic Body, 24 oz	179,219
Lotion, Extra Moisturizing Body, 9 oz	56,969
Lotion, Organic Hand and Body, 9 oz	69,194
Lotion, Organic Hand and Body, 16 oz	130,319
Mask, Organic Facial, 9 oz	114,019
Mask, Wrinkle Reducing Facial, 9 oz	154,769
Mask, Wrinkle Reducing Facial, 16 oz	30,413
Mask, Wrinkle Reducing Facial, 24 oz	45,623

A similar result can be produced using **Data Bars** or **Icon Sets** as shown in the figure below. There are a large number of built-in icon sets. Rule thresholds for icon sets and color scales can be adjusted through the Rules Manager. Both data bars and icon sets can be displayed with or without values.

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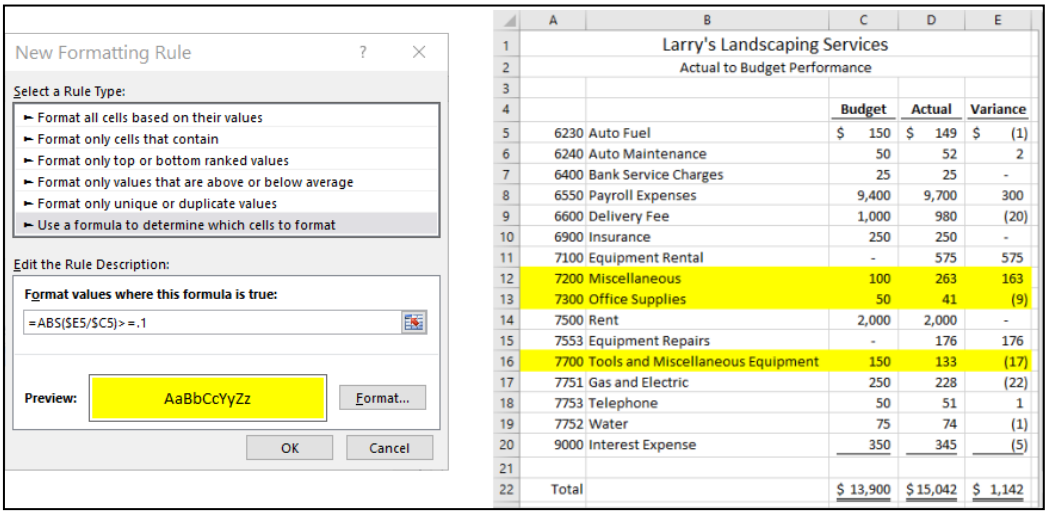
	Total		Total
Creme, Aloe Vera Hand, 9 oz	$ 56,969	Creme, Aloe Vera Hand, 9 oz	$ 56,969
Creme, Extra Moisturizing Hand, 9 oz	61,044	Creme, Extra Moisturizing Hand, 9 oz	61,044
Creme, Hand and Body, 16 oz	105,869	Creme, Hand and Body, 16 oz	105,869
Lotion, Organic Body, 9 oz	65,119	Lotion, Organic Body, 9 oz	65,119
Lotion, Organic Body, 16 oz	122,169	Lotion, Organic Body, 16 oz	122,169
Lotion, Organic Body, 24 oz	179,219	Lotion, Organic Body, 24 oz	179,219
Lotion, Extra Moisturizing Body, 9 oz	56,969	Lotion, Extra Moisturizing Body, 9 oz	56,969
Lotion, Organic Hand and Body, 9 oz	69,194	Lotion, Organic Hand and Body, 9 oz	69,194
Lotion, Organic Hand and Body, 16 oz	130,319	Lotion, Organic Hand and Body, 16 oz	130,319
Mask, Organic Facial, 9 oz	114,019	Mask, Organic Facial, 9 oz	114,019
Mask, Wrinkle Reducing Facial, 9 oz	154,769	Mask, Wrinkle Reducing Facial, 9 oz	154,769
Mask, Wrinkle Reducing Facial, 16 oz	30,413	Mask, Wrinkle Reducing Facial, 16 oz	30,413
Mask, Wrinkle Reducing Facial, 24 oz	45,623	Mask, Wrinkle Reducing Facial, 24 oz	45,623

Figure 3 - Conditional Formatting Using Data Bars and Icon Sets

> The **Highlight Cells** rules are the only rules that operate independently on each cell formatted with the condition. The other rule types format cells *relative* to the values of the other cells in the range formatted. For example, the length of data bars is relative to the largest value in the range formatted with the condition. If a range is expanded to include a larger value, the length of the data bars in the entire range will change.

The last example of conditional formatting will use a formula to apply formatting to accounts whose variances are greater than 10% of budget. The condition will be applied to the complete report table so that the entire row for each account meeting the condition will be highlighted in color. as shown in the figure below displays the finished report along with the conditions set in the **New Formatting Rule** dialog box.



To create the formatting rule, follow these six steps.

1. Highlight the range on which the conditional formatting will apply. In this case, highlight the range A5:E20.

2. From the Ribbon, select **Home, Conditional Formatting, New Rule**.

3. In the **New Formatting Rule** dialog box, select **Use a formula to determine which cells to format**.

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4. Enter the following formula in the formula box.

   =ABS($E5/$C5)>=0.1

5. Click the **Format…** button and choose the desired format to be applied to the selected cells when the criterion specified in the formula is met. Click **OK**.

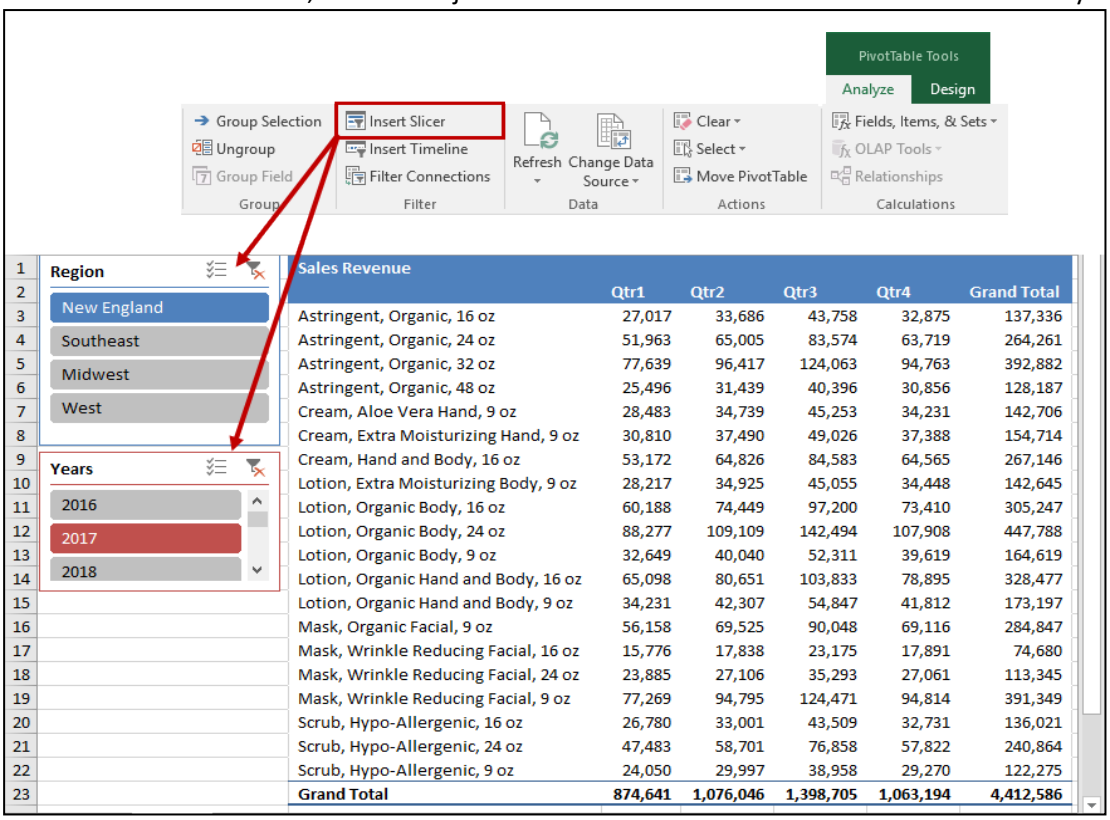
6. Click **OK** to format the report.

All rows associated with absolute values of variances that are greater than 10% of budget are now highlighted in the report.

> A bit of caution is advisable when using conditional formatting. Not all users of the report may not be knowledgeable about formulas that control the formatting. For example, a person simply looking at the results in **Figure 4** has no way of knowing the rule that created the yellow lines is based on 10% variances. Therefore, it may be a good practice to include an explanation or legend of what the conditional formatting reveals.

Using Slicers to Filter Tables and PivotTables

Think of **Slicers**, added to PivotTables with the 2010 release of Excel and to tables with the 2013 release of Excel, as end-user filters. Slicers allow you to filter data in a PivotTable, PivotChart, or table by clicking on buttons that represent one or more dimensions in a data set. You can resize and format these filtering windows like charts or other shapes in Excel. You can insert a Slicer by selecting any PivotTable or PivotChart and then selecting **Insert Slicer** from the **PivotTable Tools, Analyze** contextual tab of the Ribbon. By selecting the PivotTable or PivotChart first, the two objects will be associated with each other automatically.



	Qtr1	Qtr2	Qtr3	Qtr4	Grand Total
Astringent, Organic, 16 oz	27,017	33,686	43,758	32,875	137,336
Astringent, Organic, 24 oz	51,963	65,005	83,574	63,719	264,261
Astringent, Organic, 32 oz	77,639	96,417	124,063	94,763	392,882
Astringent, Organic, 48 oz	25,496	31,439	40,396	30,856	128,187
Cream, Aloe Vera Hand, 9 oz	28,483	34,739	45,253	34,231	142,706
Cream, Extra Moisturizing Hand, 9 oz	30,810	37,490	49,026	37,388	154,714
Cream, Hand and Body, 16 oz	53,172	64,826	84,583	64,565	267,146
Lotion, Extra Moisturizing Body, 9 oz	28,217	34,925	45,055	34,448	142,645
Lotion, Organic Body, 16 oz	60,188	74,449	97,200	73,410	305,247
Lotion, Organic Body, 24 oz	88,277	109,109	142,494	107,908	447,788
Lotion, Organic Body, 9 oz	32,649	40,040	52,311	39,619	164,619
Lotion, Organic Hand and Body, 16 oz	65,098	80,651	103,833	78,895	328,477
Lotion, Organic Hand and Body, 9 oz	34,231	42,307	54,847	41,812	173,197
Mask, Organic Facial, 9 oz	56,158	69,525	90,048	69,116	284,847
Mask, Wrinkle Reducing Facial, 16 oz	15,776	17,838	23,175	17,891	74,680
Mask, Wrinkle Reducing Facial, 24 oz	23,885	27,106	35,293	27,061	113,345
Mask, Wrinkle Reducing Facial, 9 oz	77,269	94,795	124,471	94,814	391,349
Scrub, Hypo-Allergenic, 16 oz	26,780	33,001	43,509	32,731	136,021
Scrub, Hypo-Allergenic, 24 oz	47,483	58,701	76,858	57,822	240,864
Scrub, Hypo-Allergenic, 9 oz	24,050	29,997	38,958	29,270	122,275
Grand Total	**874,641**	**1,076,046**	**1,398,705**	**1,063,194**	**4,412,586**

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The items in each Slicer are colored when selected as shown in **Figure 5** and function similarly to the drop-down menus used to filter rows, columns, and report filters within a PivotTable. To clear filters and display all values in a PivotTable or PivotChart, click the **Clear Filter** icon in the Slicer's header. Additionally, you can associate a single Slicer with multiple PivotTables by manipulating the **Report Connections** settings from the **Slicer Tools Options** tab on the Ribbon.

If you use Excel 2013 or newer, you can use Slicers to filter tables. To add one or more Slicers to a table, begin by clicking in the table. Next, choose **Insert Slicer** from either the **Insert** tab of the Ribbon or from the **Table Tools Design** tab of the Ribbon. Finally, choose the field(s) you want to filter with your Slicer and click **OK** to complete the process. As with Slicers applied to PivotTables, just click on the item(s) in the Slicer filter you want to use as your filter, and your table applies the filter immediately.

Text

Excel is, of course, best known for its ability to crunch numbers. It's also quite versatile, however, with handling text. As you know, you can enter text for such things as row and column headings, customer names and addresses, part numbers, and just about anything else. In addition (as you may expect), you can use formulas to manipulate the text contained in cells.

A Few Words about Text

When you enter data into a cell, Excel immediately goes to work and determines whether you're entering a formula, a number (including a date or time), or anything else. That “anything else” is considered text. A single cell can hold up to 32,000 characters — roughly equivalent to the number of characters in this chapter. But Excel is not a word processor, and I can't think of a reason why anyone would need to even come close to that number.

Text Functions

Excel has an excellent assortment of worksheet functions that can handle text. You can access these functions just where you'd expect: from the Text control in the Function Library group of the Formulas tab. Many of the text functions are not limited to text: They can also operate with cells that contain numeric values. You'll find that Excel is very accommodating when it comes to treating numbers as text.

The following examples are to be found in the Excel file named **F32A - Working with Text.xlsx**.

Joining Two or More Cells

Excel uses an ampersand (&) as its concatenation operator. *Concatenation* is simply a fancy term that describes what happens when you join the contents of two or more cells. For example, if cell

A16 contains the text Vancouver and cell B16 contains the text Montreal, the following formula will return VancouverMontreal:

=A16&B16

Notice that the two strings are joined together without an intervening space. To add a space between the two entries (to get Vancouver Montreal), use a formula like this one:

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=A19&" "&B19

Or, even better, use a comma and a space to produce Vancouver, Montreal

=A22&", "&B22

TRIM removes all leading and trailing spaces and replaces internal strings of multiple spaces with a single space.
This example uses the TRIM function. The formula returns FourthQuarterEarnings (with no excess spaces):

=TRIM(A26)

Changing the Case of TextExcel provides three handy functions to change the case of text:

- UPPER converts the text to ALL UPPERCASE.
- LOWER converts the text to all lowercase.
- PROPER converts the text to Proper Case (the first letter in each word is capitalized, as in a proper name).

These functions are quite straightforward. The formula that follows, for example, converts the text in cell A32 to proper case.

=PROPER(A32)

If cell A1 contained the text MR. JOHN Q. PUBLIC, the formula would return Mr. John Q. Public.

These functions operate only on alphabetic characters; theys imply ignore all other characters and return them unchanged.

Extracting Characters from a String

Excel users often need to extract characters from a string. For example, you may have a list of employee names (first and last names) and need to extract the last name from each cell. Excel provides several useful functions for extracting characters:

- LEFT returns a specified number of characters from the beginning of a string.
- RIGHT returns a specified number of characters from the end of a string.
- MID returns a specified number of characters beginning at a specified position within a string.

Cell A35 contains the text string: K2E Canada Inc. The following formula returns the last eleven characters from cell A35; if A35 contains fewer than eleven characters, the formula returns all text in the cell:

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=RIGHT(A35,11)

The result is Canada Inc.

Cell A36 contains the text string: K2E Canada Inc. The following formula returns the first eleven characters from cell A35; if A35 contains fewer than eleven characters, the formula returns all text in the cell:

=LEFT(A36,11)

The result is K2E Canada

Cell A37 contains the text string: K2E Canada Inc. This next formula uses the MID function to return eleven characters from cell A37, beginning at character position 5. In other words, it returns characters 5 through 11.

=MID(A37,5,11)

The result is Canada Inc.

Date-Related Worksheet Functions

Excel has quite a few functions that work with dates. These functions are accessible by choosing Formulas ⇒ Function Library ⇒ Date & Time.

The table below summarizes the date-related functions available in Excel.

Date Function Table

V	*Function*	*What It Does*
	DATE	Returns the serial number of a particular date
	DATEVALUE	Converts a date in the form of text to a serial number
	DAY	Converts a serial number to a day of the month
**	DAYS	Returns the number of days between two dates
*	DAYS360	Calculates the number of days between two dates based on a 360-day year
	DAYS360	Calculates the number of days between two dates based on a 360-day year
*	EDATE	Returns the serial number of the date that represents the indicated number of months before or after the start date
*	EOMONTH	Returns the serial number of the last day of the month before or after a specified number of months
	MONTH	Converts a serial number to a month
*	NETWORKDAYS	Returns the number of whole work days between two dates
	NOW	Returns the serial number of the current date and time

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	TODAY	Returns the serial number of today's date
	WEEKDAY	Converts a serial number to a day of the week
*	WEEKNUM	Returns the week number in the year
*	WORKDAY	Returns the serial number of the date before or after a specified number of workdays
*	YEARFRAC	Returns the year fraction representing the number of whole days between the start date and the end date
	YEAR	Converts a serial number to a year
ı versions prior to Excel 2007, these functions are available only when the Analysis ToolPak add-in is installed.		
** This function is only available in Excel 2013		

Displaying the Current Date

The Excel file ***Working with Dates.xlsx*** *illustrates the following date functions.*

The following formula uses the TODAY function to display the current date in a cell:

=TODAY()

You can also display the date combined with text. The formula that follows, for example, displays text, such as Today is Friday, April2, 2015:

=”Today is “&TEXT(TODAY(),”dddd, mmmm d, yyyy”)

It's important to understand that the TODAY function is not a date stamp. The function is updated whenever the worksheet is calculated. For example, if you enter either of the preceding formulas into a worksheet, the formulas display the current date. And when you open the workbook tomorrow, they will display the current date (*not* the date when you entered the formula).

Displaying any Date

You can easily enter a date into a cell by simply typing it while using any of the date formats that Excel recognizes. You can also create a date by using the DATE function, which takes three arguments: the year, the month, and the day. The following formula, for example, returns a date comprising the year in cell B9, the month in cell C9, and the day in cell D9:

=DATE(B10,C10,D10)

Often, you'll use the DATE function with other functions as arguments. For example, the following formula uses the YEAR and TODAY functions to return the date for April 2 of the current year:

=DATE(YEAR(TODAY()),2,4)

The DATEVALUE function converts a text string that looks like a date into a date serial number. The following formula returns 40508, which is the date serial number for August 22, 2013:

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=DATEVALUE(“8/22/2013”)

To view the result of this formula as a date, you need to apply a date number format to the cell.

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