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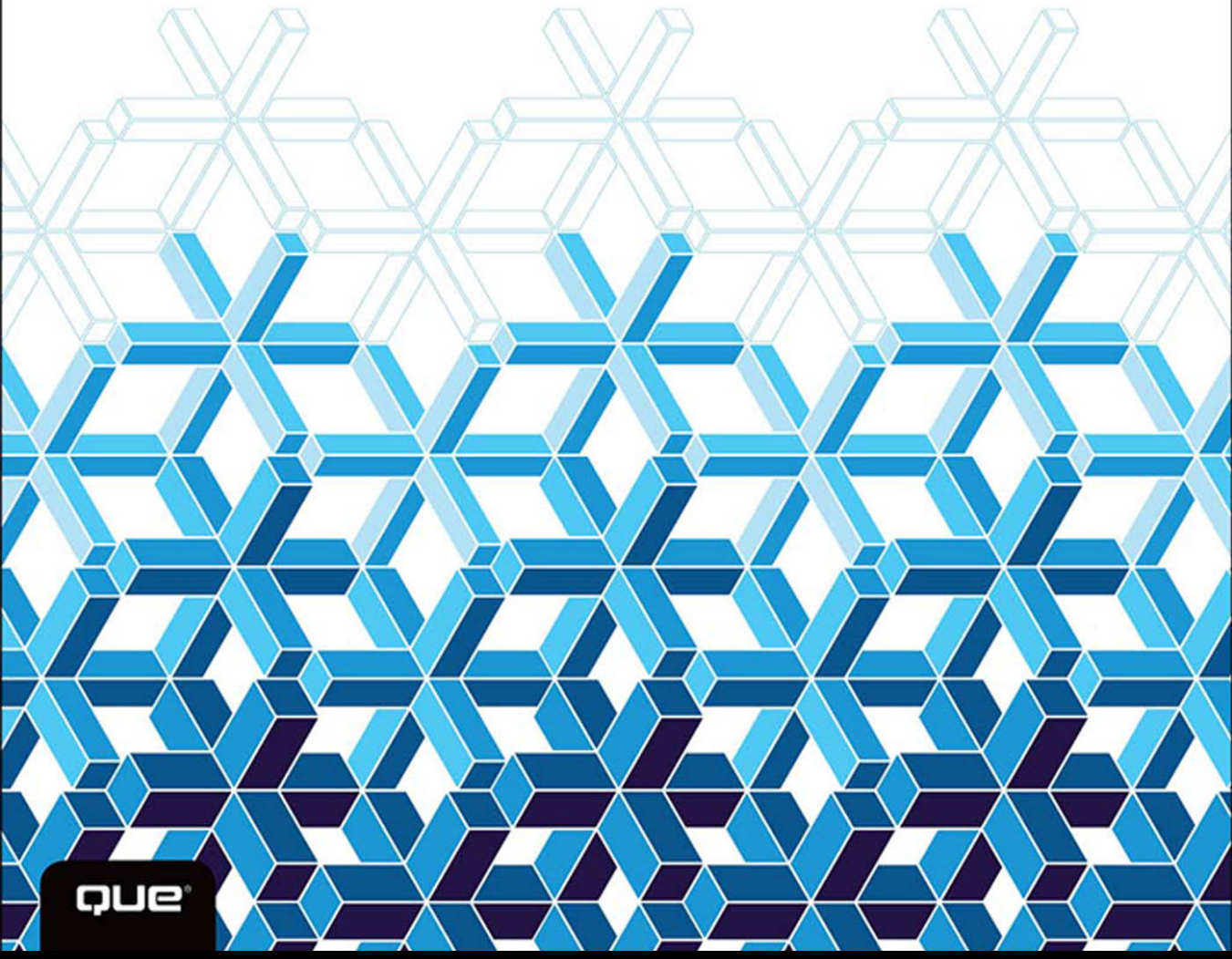

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ABOUT THE AUTHOR

Bill Jelen, Excel MVP and the host of MrExcel.com, has been using spreadsheets since 1985, and he launched the MrExcel.com website in 1998. He loves performing his half-day Power Excel seminar around the world. He has produced more than 1,900 episodes of his daily video podcast, Learn Excel from MrExcel. He is the author of 45 books about Microsoft Excel and writes the monthly Excel column for Strategic Finance magazine. Before founding MrExcel.com, Bill Jelen spent 12 years in the trenches—working as a financial analyst for finance, marketing, accounting, and operations departments of a $500 million public company. He lives in Merritt Island, Florida, with his wife, Mary Ellen.

Dedication

To Robert K. Jelen, my favorite brother

Acknowledgments

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Other Excel MVPs often offered their take on a potential bug. I could send a group email over a weekend and someone like Kevin Jones, Zack Baresse, Ken Puls, Roger Govier, or Ingeborg Hawighorst would usually respond. I particularly loved launching a missive just after the Microsoft crew in Building 36 went home on Friday evening, knowing they would return on Monday morning with 40 or 50 responses to the conversation. Without any Excel project managers to temper the discussion, we would often have designed massive improvements that we would have liked to have implemented in Excel. Someone would show up on Monday and tell us why that could never be done.

Bob Umlas is the smartest Excel guy that I know, and I was thrilled to have him as the technical editor for this book. Also, thanks to Barbara Hacha for copy editing.

Robert F. Jelen, my 93-year-old father, recently moved near us. I enjoy our daily lunches. I apologize that I had to miss a few when deadlines for this book were looming.

Mary Ellen Jelen did a great job of keeping me on track with this book.

WE WANT TO HEAR FROM YOU!

As the reader of this book, *you* are our most important critic and commentator. We value your opinion and want to know what we're doing right, what we could do better, what areas you'd like to see us publish in, and any other words of wisdom you're willing to pass our way.

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INTRODUCTION

Many members of the team who build Excel spent the past two years creating versions of Excel that would run on Android and iOS mobile devices. Subsequently, there are fewer new features in Excel 2016 than in a normal release of Office. The theory is that more features can be rolled out monthly for people who are renting Excel through one of the Office 365 subscriptions.

At the official release of Office 2016, here are the new features in Excel 2016:

- The charting team introduced six new chart types: Waterfall, Histogram, Pareto, Box & Whisker, Treemap, and Sunburst. Read about these charts in Chapter 23, "Graphing Data Using Excel Charts."
- The new charts are based on a new charting engine. Over the next few years, all the legacy charts will move to this new engine.
- The Power Query add-in for Excel 2010 and Excel 2013 has been embedded in the Data tab and renamed Get & Transform. I love the feature, but I hate the new name. Read about the feature formerly known as Power Query in Chapter 13, "Transforming Data."
- Power Map debuted for Office 365 customers after the release of Excel 2013. The add-in lets you visualize your data on a 3D map and create tours through the data. It is a beautiful feature and can now be found on the Insert tab. Read about this feature in Chapter 24, "Using 3D Maps."

- Forecast Sheets produce a seasonally adjusted forecast from any time series. This functionality is powered by five new functions: `FORECAST.ETS`, `FORECAST.ETS.CONFINT`, `FORECAST.ETS.SEASONALITY`, `FORECAST.ETS.STAT`, and `FORECAST.LINEAR`. Read about this in Chapter 1, "What's New in Excel 2016 (and 2013)."
- Dates added to a pivot table will automatically group to months, quarters, and years. Read more in Chapter 15, "Using Pivot Tables to Analyze Data."
- Slicers get an easier multiselect functionality. Read about this in Chapter 16, "Using Slicers and Filtering a Pivot Table."
- Insights powered by Bing allow you to right-click any cell and select Smart Lookup to search the Internet for that term. Results appear in a task pane to the right of your Excel screen. Read about this feature in Chapter 1.
- Tell Me What You Want To Do is a poorly conceived way to find commands in Excel. If you remember that the name of the command is Data Validation but can't remember that it is found on the Data tab, this command might be mildly useful. But any normal phrases typed in the Tell Me box fail to find the correct command. I hope someone at Microsoft is collecting all the phrases that get typed and followed by Esc so the company can build some actual intelligence into this feature. I mention this feature again in Chapter 2, "Using the Excel Interface."
- Convert Handwritten Equations to Text makes a great marketing demo, but few people actually have to do something like this.
- For those of you suffering snow blindness from the all-white theme in Excel 2013, you will enjoy the colorful theme. Also, horribly conceived Excel 2013 features such as slot-machining and RIBBON TABS IN ALL CAPS have been removed from Excel 2016.

How This Book Is Organized

The book is organized into the following parts:

- **Chapters 1–4** cover the Excel Interface.
- **Chapters 5–12** cover what Excel does best, from formulas to functions to linking.
- **Chapters 13–20** cover sorting, filtering, subtotals, and pivot tables. These are the tools of the Excel data analyst. Learn about these tools and the new PowerPivot. The chapter on VBA macros is also in this part of the book.
- **Chapters 21–28** cover charting, SmartArt, data visualizations, and picture tools. After you get done analyzing the data, a few features from this part will make your reports look good.

Conventions Used in This Book

The special conventions used throughout this book are designed to help you get the most from the book as well as Excel 2016.

Text Conventions

Different typefaces are used to convey various things throughout the book. They include those shown in Table I.1.

Table I.1 Typeface Conventions

Typeface	Description
`Monospace`	Screen messages and Excel formulas appear in `monospace`.
`Italic`	New terminology appears in italic.
`Bold Monospace`	References to text you should type appear in **`bold monospace`**.

Ribbon names, dialog names, and dialog elements are capitalized in this book (for example, Add Formatting Rule dialog, Home ribbon tab).

In this book, key combinations are represented with a plus sign. If the action you need to take is to press the Ctrl key and the T key simultaneously, the text tells you to press Ctrl+T.

Special Elements

Throughout this book, you'll find tips, notes, cautions, cross-references, case studies, Excel in Practice boxes, sidebars, and Troubleshooting Tip boxes. These elements provide a variety of information, ranging from warnings you shouldn't miss to ancillary information that will enrich your Excel experience but that isn't required reading.

tip

Tips point out special features, quirks, or software tricks that will help you increase your productivity with Excel 2016.

note

Notes contain extra information or alternative techniques for performing tasks.

caution

Cautions call out potential gotchas.

***See** Chapter 99 for more information* is a cross-reference to another section or chapter in this book.

Case Study: Other Elements

Sections such as Case Study, Excel in Practice, and Troubleshooting Tips are set off in boxes such as this one:

- Case Studies walk you through the steps to complete a task.
- Excel in Practice boxes walk through real-life problems in Excel.
- Troubleshooting Tip boxes walk you through steps to avoid certain problems or explain how to react when certain problems occur.

Sidebars

Historical glimpses and other information that is not critical to your understanding appear as sidebars.

3

CUSTOMIZING EXCEL

The Excel Options dialog offers dozens of changes you can make in Excel. This chapter walks you through examples of customizing the ribbon and discusses some of the important option settings available in Excel.

Performing a Simple Ribbon Modification

Suppose that you generally like the ribbon but there is one icon that seems to be missing. You can add icons to the ribbon to make it customized to your preference. If you feel the Data tab would be perfect with the addition of a pivot table icon, you can add it (see Figure 3.1).

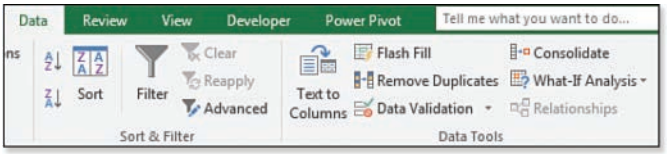


Figure 3.1
Decide where the new command should go on the ribbon.

To add the pivot table command to the Data tab, follow these steps:

1. Right-click the ribbon and select Customize the Ribbon.
2. In the right list box, expand the Data tab by clicking the + sign next to Data.
3. Click the Sort & Filter entry in the right list box. The new group will go after this entry.
4. Click the New Group button at the bottom of the right list box. A New Group (Custom) item appears after Sort & Filter, as shown in Figure 3.2.

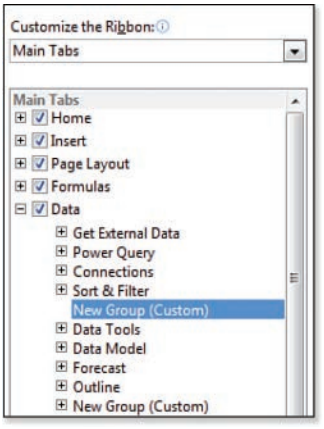


Figure 3.2
Commands have to be added to a new group.

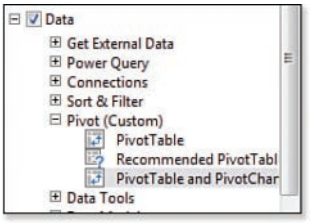
5. While the New Group is selected, click the Rename button at the bottom of the list box. The Rename dialog appears.
6. The Rename dialog offers to let you choose an icon and specify a name for the group. The icon is shown only when the Excel window is too small to display the whole group. Choose any icon and type a display name of **`Pivot`**. Click OK.
7. The left list box shows the popular commands. You could change Popular Commands to All Commands and scroll through 2,400 commands. However, in this case, the commands you want are on the Insert tab. Choose All Tabs from the top-left drop-down. Expand the Insert tab, and then expand Tables. Click PivotTable in the left list box. Click the Add button in the center of

the dialog to add PivotTable to the new custom Pivot group on the ribbon. Excel automatically advances to the next icon of Recommended PivotTables. Click Add again.

8. In the drop-down above the left list box, select All Commands. The left list box changes to show an alphabetical list of all commands.

9. Scroll through the left list box until you find PivotTable and PivotChart Wizard. This is the obscure entry point to create Multiple Consolidation Range pivot tables. Select that item in the left list box. Click Add. At this point, the right side of the dialog should look like Figure 3.3.

Figure 3.3
Three new icons have been added to a new custom group on the Data tab.



10. Click OK.

Figure 3.4 shows the new group in the Data tab of the ribbon.

Figure 3.4
The results appear in the ribbon.

Adding a New Ribbon Tab

To add a new ribbon tab, follow these basic steps:

1. Right-click the ribbon and select Customize the Ribbon.
2. Click New Tab and rename the tab.
3. Add New Group(s) to the new tab.
4. Add commands to the new groups.

As you go through the steps to add a new ribbon tab, you will discover how absolutely limiting the ribbon customizations are. You have no control over which items appear with large icons and which appear with small icons. This applies even to galleries. If you add the Cell Styles gallery to a group on the ribbon, it always appears as an icon instead of a gallery, even if it is the only thing on the entire ribbon tab (see the left icon in Figure 3.5). The workaround is to add an entire built-in group

to the tab. In the right of Figure 3.5, the entire Styles group was added. The Cell Styles gallery is now allowed to appear as a gallery.

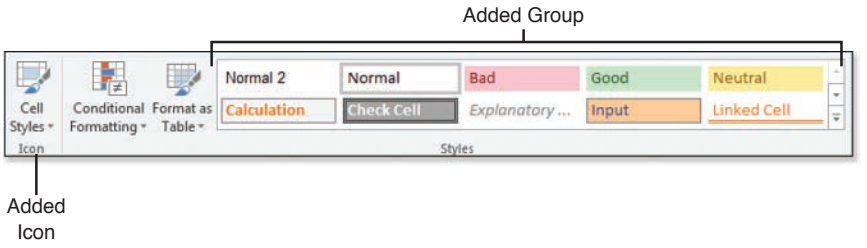


Figure 3.5
When added to a custom group, a gallery is reduced to a single icon with a drop-down.

Sharing Customizations with Others

If you have developed the perfect ribbon customization and you want everyone in your department to have the same customization, you can export all the ribbon customizations.

To export the changes, follow these steps:

1. Right-click the ribbon and select Customize the Ribbon.
2. Below the right list box, select Import/Export, Export All Customizations.
3. Browse to a folder and provide a name for the customization file. The file type will be .exportedUI. Click OK.
4. In Windows Explorer, find the .exportedUI file. Copy it to a co-worker's computer.
5. On the co-worker's computer, repeat step 1. In step 2, select Import Customization File. Find the file and click OK.

note
This is an all-or-nothing proposition. You cannot export your changes to one custom tab without exporting your changes to the Data and Home tabs.

Questions About Ribbon Customization

Can the customizations apply only to a certain workbook?

No. The Customize the Ribbon command in Excel 2016 applies to all workbooks.

Can I reset my customizations and go back to the original ribbon?

Right-click the ribbon and select Customize the Ribbon. Below the right list box, select Reset, Reset All Customizations.

How can I get complete control over the ribbon?

Learn RibbonX and write some VBA to build your own ribbon.

➥ *For more information on building your own ribbon,* ***see*** RibbonX: Customizing the Office 2007 Ribbon*, by Robert Martin, Ken Puls, and Teresa Hennig (Wiley, ISBN 0470191112).*

These ribbon customizations are really lacking. Is there another option that doesn't require me to write a program?

Yes, a number of third-party ribbon customization programs are available. For example, check out a free one from Excel MVP Andy Pope at www.andypope.info/vba/ribboneditor.htm.

Introducing the Excel Options Dialog

Open the File menu and select Options from the left navigation pane to open the Excel Options dialog. The dialog has categories for General, Formulas, Proofing, Save, Language, Advanced, Customize Ribbon, Quick Access Toolbar, Add-Ins, and Trust Center. The Trust Center leads to another 12 categories.

To the Excel team's credit, they tried to move the top options to the General category. Beyond those 15 settings, though, are hundreds of settings spread throughout 21 categories in the Excel Options and Trust Center. Table 3.1 gives you a top-level view of where to start looking for settings.

Table 3.1 Excel Options Dialog Settings

Category	Types of Settings
General	The most commonly used settings, such as user interface settings, default font for new workbooks, number of sheets in a new workbook, customer name, and Start screen.
Formulas	All options for controlling calculation, error-checking rules, and formula settings. Note that options for multithreaded calculations are currently considered obscure enough to be on the Advanced tab rather than on the Formulas tab.
Proofing	Spell-check options and a link to the AutoCorrect dialog.
Save	The default method for saving, AutoRecovery settings, legacy colors, and web server options.
Language	Choose the editing language, ToolTip language, and Help language.
Advanced	All options that Microsoft considers arcane, spread among 13 headings.
Customize Ribbon	Icons to customize the ribbon.
Quick Access Toolbar	Icons to customize the Quick Access Toolbar (QAT).
Add-Ins	A list of available and installed add-ins. New add-ins can be installed from the button at the bottom of this category.
Trust Center	Links to the Microsoft Trust Center, with 12 additional categories.

Getting Help with a Setting

Many settings appear with a small *i* icon. If you hover the mouse near this icon, Excel displays a super ToolTip for the setting. The ToolTip explains what happens when you choose the setting. It also provides some tips about what you need to be aware of when you turn on the setting. For example, the ToolTip in Figure 3.6 shows information about the calculation settings. It also explains that you should use the F9 key to invoke a manual calculation.

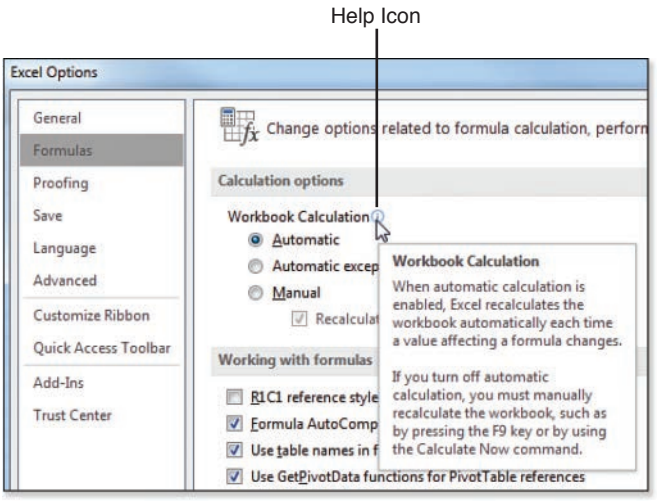


Figure 3.6
The i button offers an explanation of many settings.

New Options in Excel 2016

Excel 2016 offers two new settings. The first is welcome because it enables you to turn off an annoying animation feature introduced in Excel 2013. Here are some changes you might notice in Excel 2016 Options:

- Provide Feedback with Animation enables you to turn off the animations introduced in Excel 2013. It is found in the General category of the Advanced tab.
- Enable Data Analysis Add-Ins: PowerPivot, Power View, and Power Map enables you to turn on these three add-ins in a single click instead of using the Add-Ins category. The setting is found in the Data category of the Advanced tab. This setting applies only if you own a version of Excel 2016 that includes the add-ins.

Using AutoRecover Options

For many versions, Excel periodically saves a copy of your work every 10 minutes. If your computer crashes, the recovery pane offers to let you open the last AutoRecovered version of the file. This feature is sure to save you from retyping data that might have otherwise been lost.

Another painful situation occurs when you do not save changes and then close Excel. Yes, Excel asks if you want to save changes for each open document, but this question usually pops up at 5:00 p.m. when you are in a hurry to get out of the office. If you are thinking about what you need to do after work and not paying attention to which files are still open, you might click No to the first document and then click No again and again without noticing that the fifth open document was one that should have been saved.

Another scenario involves leaving an Excel file open overnight only to discover that Windows Update decided to restart the computer at 3:00 a.m. After being burned a dozen times, you can change the behavior of Windows Update to stop doing this. However, if Windows Update closed Excel without saving your documents, you can lose those AutoRecovered documents.

A setting introduced in Excel 2010 has Excel save the last AutoRecovered version of each open file when you close without saving. This setting is on the Save category of Excel Options and is called Keep the Last AutoSaved Version If I Close Without Saving.

Controlling Image Sizes

An Image Size & Quality section appears in the Advanced category. Most people add a photo to dress up the cover page of a document. However, you probably don't need an 8-megapixel image being saved in the workbook. By default, Excel compresses the image before saving the file. You can control the target output size using the drop-down in Excel options. Choices include 96ppi, 150ppi, and 220ppi. The 96ppi setting will look fine on your display. Use 220ppi for images you will print. If you want to keep your images at the original size, you can select the Do Not Compress Images in File setting.

You should also understand the Discard Editing Data check box. Suppose that you insert an image in your workbook and then crop out part of the photograph. If you do not enable Discard Editing Data, someone else can come along and uncrop your photo. This can be an embarrassing situation—just ask the former TechTV co-host who discovered certain bits of photographs were still hanging around after she cropped them out.

Working with Protected View for Files Originating from the Internet

Starting in Excel 2010, files from the Internet or Outlook initially open in protected mode. This mode gives you a chance to look at the workbook and formulas without having anything malicious happen. Unfortunately, you cannot view the macro code while the workbook is in protected view.

If you only want to view or print the workbook, protected mode works great. One statistic says that 40% of the time, people simply open a document and never make changes to it.

After you click Enable Editing, Excel will skip protected mode the next time you open the file.

Working with Trusted Document Settings

By default, Excel warns you about all sorts of things. If you open a workbook with macros, links, external data connections, or even the new `WEBSERVICE` function, a message bar appears above the worksheet to let you know that Excel disabled those "threats."

If you declare a folder on your hard drive to be a trusted folder, you can open those documents without Excel warning you about the items. Visit File, Options, Trust Center, Trust Center Settings, Trusted Locations to set up a trusted folder.

Starting in Excel 2010, if you open a file from your hard drive and enable the content, Excel automatically enables that content the next time. The inherent problem here is that if you open a file and discover the macros are bad, you will not want those macros to open automatically the next time. There is no way to untrust a single document other than deleting, renaming, or moving it. Instead, you have to go to the Trusted Documents category of the Trust Center where you can choose to clear the entire list of trusted documents.

Options to Consider

Although hundreds of Excel options exist, this section provides a quick review of options that might be helpful to you:

- Save File in This Format in the Save category. If you regularly create macros, choose the Excel Macro-Enabled Workbook as the default format type.
- Update your Default File Location in the Save tab. Excel always wants to save new documents in your My Documents folder. However, if you always work in the C:\AccountingFiles\ folder, update the default folder to match your preferred location.
- Show This Number of Recent Workbooks has been enhanced dramatically since Excel 2003. Whereas legacy versions of Excel showed up to nine recent workbooks at the bottom of the File menu, Excel 2016 allows you to see up to 50 recent workbooks in the Recent category of the File menu. You can change this setting by visiting the Display section of the Advanced category.
- Edit Custom Lists has been moved to the Display section of the Advanced category. Custom lists add functionality to the fill handle, allow custom sort orders, and control how fields are displayed in the label area of a pivot table. Type a list in the correct sequence in a worksheet. Edit Custom Lists and click Import. Excel can now automatically extend items from that list, the same as it can extend January into February, March, and so on.
- Make Excel look less like Excel by hiding interface elements in the three Display sections of the Advanced category. You can turn off the formula bar, scrollbars, sheet tabs, row and column headers, and gridlines. You can customize the ribbon to remove all main tabs except the File menu. The point is that if you design a model to be used by someone who never uses Excel, the person can open the model, plug in a few numbers, and get the result without having to see the entire Excel interface.
- Show a Zero in Cells That Have Zero Value is in the Display Options for This Worksheet section of the Advanced category. Occasionally people want zeros to be displayed as blanks. Although a custom number format of `0;-0;;` will do this, you can change the setting globally by clearing this option.
- Group Dates in the AutoFilter Menu is in the Display Options for This Workbook section of the Advanced category. Starting with Excel 2007, date columns show a hierarchical view of years,

months, and days in the AutoFilter drop-down. If you like the old behavior of showing each individual date, turn off this setting.

- Add a folder on your local hard drive as a trusted location. Files stored in a trusted location automatically have macros enabled and external links updated. If you can trust that you will not write malicious code, then define a folder on your hard drive as a trusted location. From Excel Options, select the Trust Center category and then Trust Center Settings. In the Trust Center, select Trusted Locations, Add New Location.

Five Excel Oddities

You might rarely need any of the features presented in this section. However, in the right circumstance, they can be time-savers.

- Adjust the gridline color in the Display section of the Advanced category. If you are tired of gray gridlines, you can get a new outlook with bright red gridlines. I've met people who have changed the gridline color and can attest that nothing annoys an old accountant more than seeing bright red gridlines.
- Allow negative time by switching to the 1904 date system in the General section of the Advanced category. Excel never allows a time to return a negative time. However, if you are tracking comp time and you allow people to borrow against future comp time, it might be nice to allow negative time. In this case, switch to the 1904 date system to have up to 4 years of negative time. Use caution when changing this setting. All existing dates in the workbook will shift by approximately four years.
- Put an end to the green triangles on your account numbers stored as text. Most of the green triangle indicators are useful. However, if you have a column of text account numbers in which most values are numbers, seeing thousands of green triangles can be annoying. In addition, the green triangles can hide other, more serious problems. Clear the Numbers Formatted as Text or Preceded by an Apostrophe in the Error Checking Rules check box in the Formulas category.
- Automatically Insert a Decimal Point replicates the antique adding machines that were office fixtures in the 1970s. When working with a manual adding machine, it was frustrating to type decimal points. You could type **123456** and the adding machine would interpret the entry as 1,234.56. If you find that you are doing massive data entry of numbers in dollars and cents, you can have Excel replicate the old adding machine functionality. After enabling this setting, you can indicate how many digits of the number should be interpreted as being after the decimal point. The only hassle is that you need to enter $5 as **500**. The old adding machines actually had a 00 key, but those are long since gone.
- Change *Dwight* to *Diapers* using AutoCorrect Options. If you were a fan of the NBC sitcom *The Office*, you might remember the 2007 episode in which Jim allegedly put a macro on Dwight's computer that automatically changed the typed word *Dwight* to *Diapers*. However, this doesn't require a macro. From Excel Options, choose the Proofing Category and then click the AutoCorrect Options button. On the AutoCorrect tab, you can type new correction pairs. In this

example, you would type **Dwight** into the Replace box and **Diapers** into the With box. The next time someone types *Dwight* and then a space, the word will automatically change to *Diapers*. You can also remove correction pairs by selecting the pairs and then pressing Delete. For example, if you hate that Microsoft converts (c) to ©, you can delete that entry from the list.

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