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Microsoft MOUS Excel 2002 Expert

Version 3.0.0

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Version 3.0.0

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Abstract:

This study guide will help you prepare for the performance-based exam, Microsoft MOUS Excel 2002 Expert. This exam consists of high-level tasks, including importing and exporting data, managing workbooks, auditing a worksheet, formatting numbers, using macros, working with ranges, customizing Excel, summarizing data, analyzing data, and workgroup collaboration.

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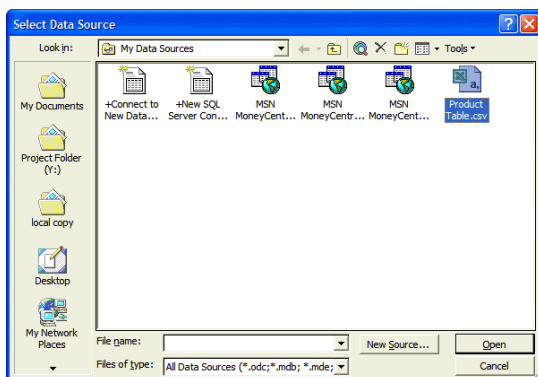
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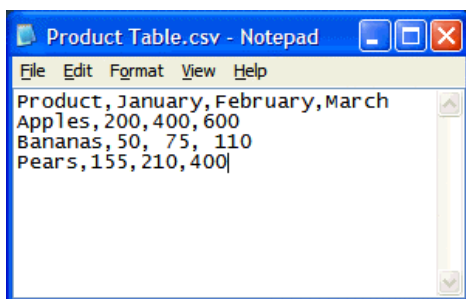
Importing and Exporting Data

Import data to Excel

To import data from a comma-separated value (.CSV) text file, click **Data => Import External Data => Import Data....** In the **Select Data Source** dialog box, browse to the desired .CSV file and click **Open**.



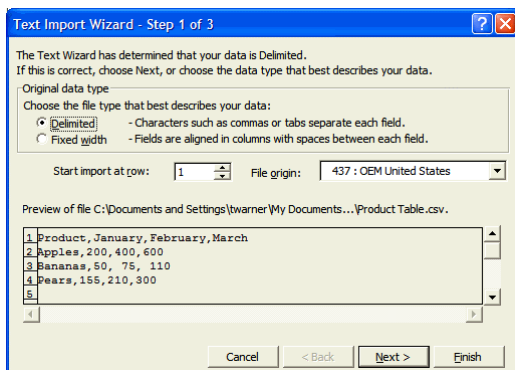
The following screen capture shows the .CSV file that is used in this example.



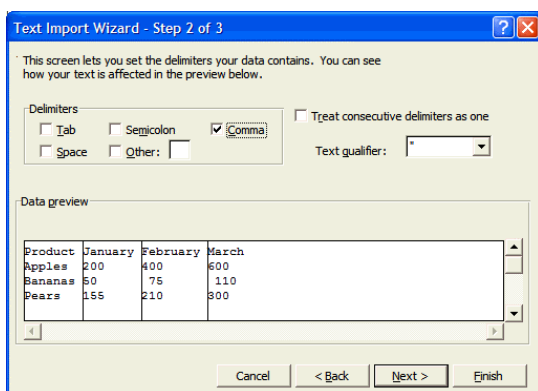


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In the **Text Import Wizard-Step 1 of 3** dialog box, ensure that **Delimited** is selected and press **Next**.



In the **Text Import Wizard-Step 2 of 3** dialog box, select **Comma** in the **Delimiters** option group and preview your data in the **Data preview** list box. Press **Next** to continue.

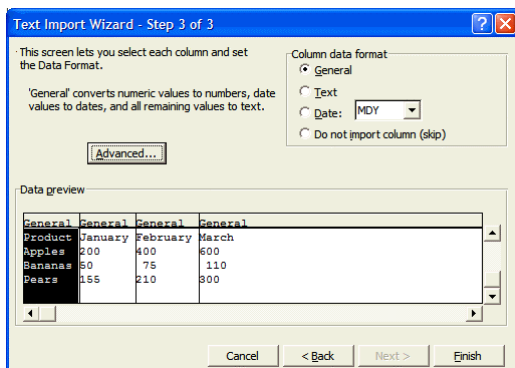


In the **Text Import Wizard-Step 3 of 3** dialog box, select each column in the **Data preview** list box and choose an appropriate data type from the **Column data**

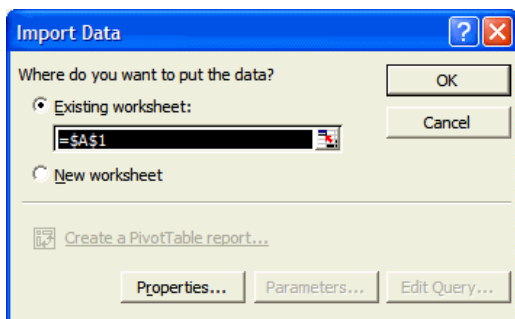


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format option group. Note that the **General** setting automatically determines whether the data in each column is text, a number, or a date. Press **Finish** to continue.

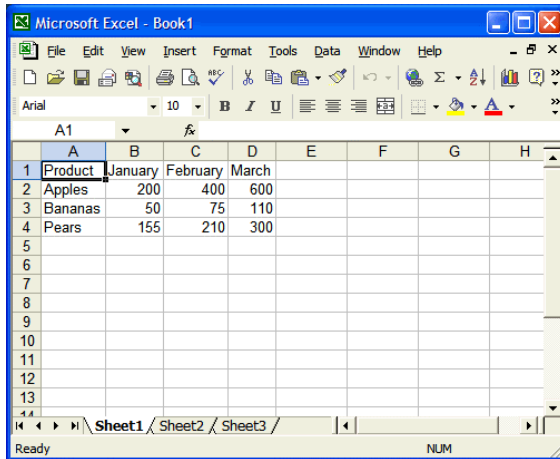


In the **Import Data** dialog box, decide where you want to place the newly imported data by making the desired choice from the **Where do you want to put the data?** option group. Click **OK** to complete the procedure.

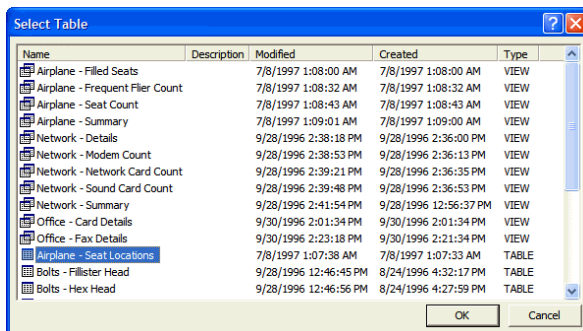




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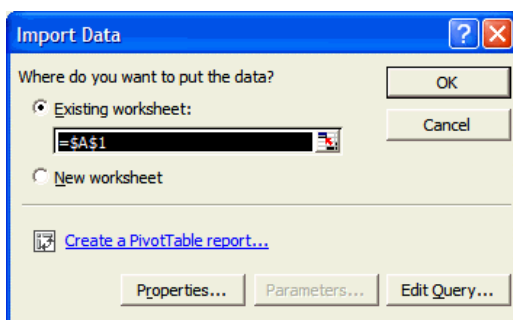
To import data from a Microsoft Access database table, click **Data => Import External Data => Import Data...** Browse to the Access **.MDB** file and click **Open**. In the **Select Table** dialog box, select the Access database table that you want to import into Excel and click **OK**.




In the **Import Data** dialog box, specify where you want Excel to place the imported data and click **OK**.



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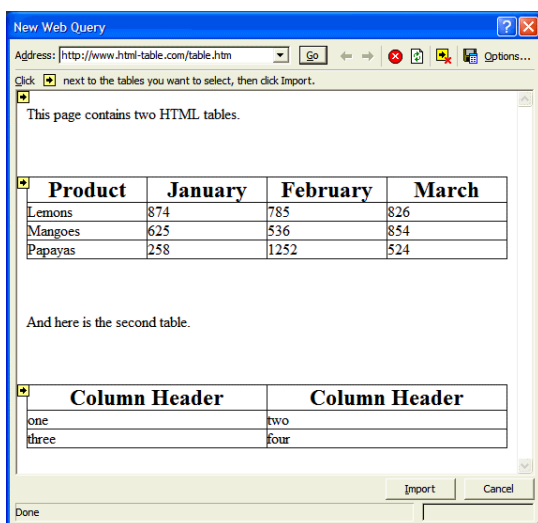


SeatNumber	PinX	PinY	Width	Height	Class
10A	109 ft 9 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10B	111 ft 9 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10C	115 ft 6 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10D	117 ft 6 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10E	119 ft 6 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10F	123 ft 9 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
10G	125 ft 9 in	157 ft 3 in	2 ft	3 ft 3 in	Business Class
11A	109 ft 9 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11B	111 ft 9 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11C	115 ft 6 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11D	117 ft 6 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11E	119 ft 6 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11F	123 ft 9 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
11G	125 ft 9 in	153 ft 3 in	2 ft	3 ft 3 in	Business Class
12A	109 ft 9 in	149 ft 4.5 in	2 ft	3 ft 3 in	Business Class
12B	111 ft 9 in	149 ft 4.5 in	2 ft	3 ft 3 in	Business Class
12C	115 ft 6 in	149 ft 4.5 in	2 ft	3 ft 3 in	Business Class
12D	117 ft 6 in	149 ft 4.5 in	2 ft	3 ft 3 in	Business Class

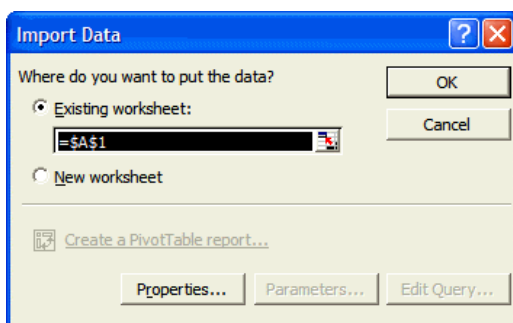
To import an HTML Web-based table into Excel, click **Data => Import External Data => Import Data...**. Browse to the HTML file that contains the table and click **Open**. In the **New Web Query** dialog box, use the arrow icons  to select the table or tables that you want to import into Excel. Press **Import** to continue.



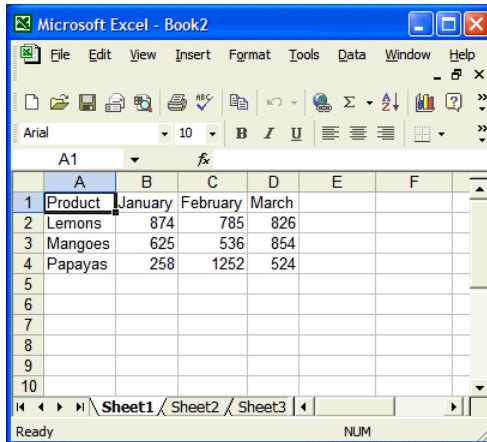
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You should be well familiar with the **Import Data** dialog box by now.

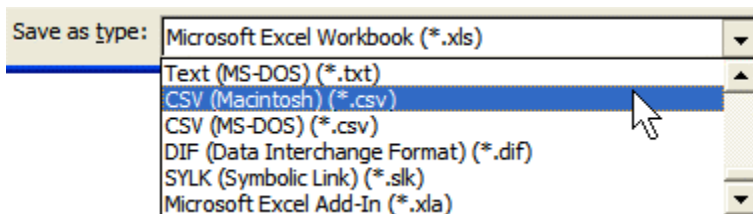


Note in the following screen capture that imported HTML tables lose all of their formatting in Excel.



Export data from Excel

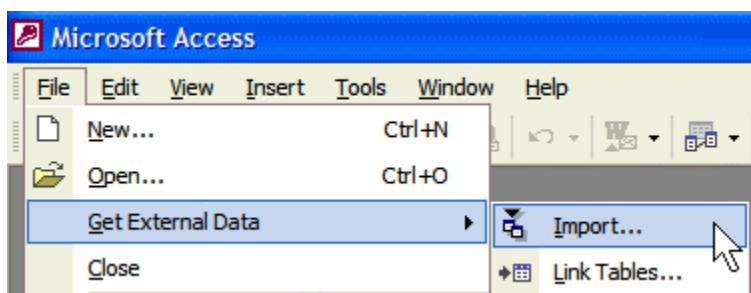
One simple way to export Excel data is to save an Excel workbook file in a different file format. Click **File => Save As...**, and in the **Save As** dialog box open the **Save as type:** drop-down list box. Note that you will be able to save the Excel file in a variety of different file formats, including MS-DOS and Macintosh file formats. Be aware, however, that most formatting will be stripped from your data in order to make the data conversion to alternate file formats, especially earlier file formats than Excel 2002.



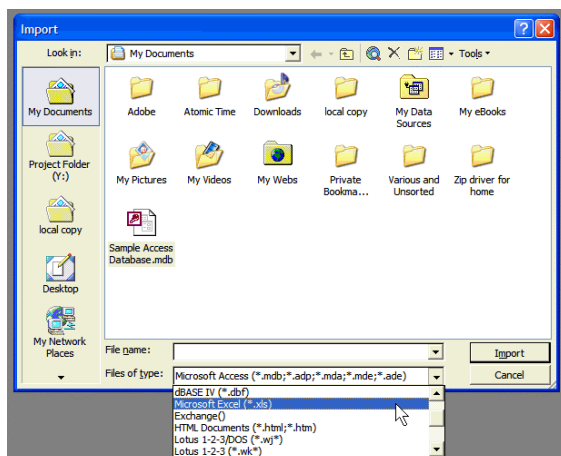
To import Excel data into a Microsoft Access database table, open an Access database and click **File => Get External Data => Import....**



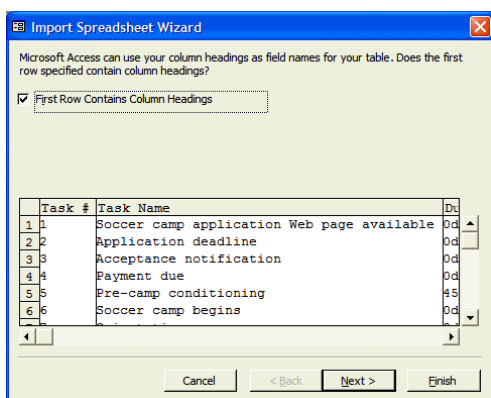
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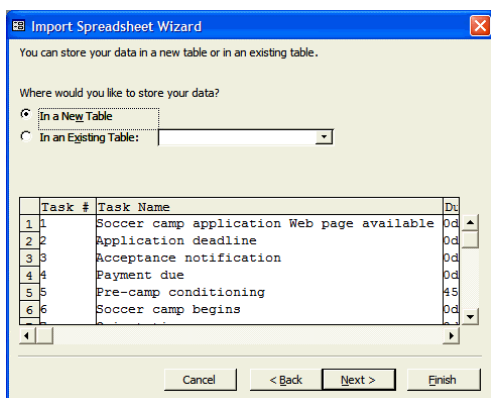
In the **Import** dialog box, open the **Files of type:** drop-down list box and select **Microsoft Excel (*.xls)**. Then browse to the desired Excel file and click **Import**. I should say at this time that your Excel data should be in *list format*. That is to say, the very first row in the table should be somehow set off from the rest of the data (using bold or italic formatting, for instance), and there should be absolutely no spaces anywhere within the list. This is an important point. And by the way, the Excel file should be closed before you undertake the import procedure.



In the first page of the **Import Spreadsheet Wizard** dialog box, select **First Row Contains Column Headings** to ensure that Access doesn't consider your column headings as simply another row of data. Click **Next** to continue.



In the second page of the **Import Spreadsheet Wizard** dialog box, decide whether you want the imported Excel data to reside in a brand new Access table, or if you want to append the Excel data to an existing Access table. Click **Next** to continue.



In the third page of the **Import Spreadsheet Wizard** dialog box, select each field in the lower portion of the dialog box and optionally adjust each field's name and index status. Note that Access usually makes a pretty good guess as to what data type each field uses. For example, in the following screen capture, Access will assign



the **Date/Time** data type to the **Start Date** field. Don't worry about not being able to adjust the data type in this dialog box: you will be able to make this change after the Access table has been created. Click **Next** to continue.

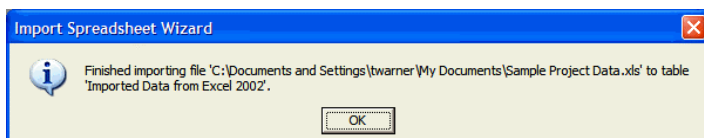
	Task Name	Duration	Start Date	Outline Level
1	Web page available	0	1/4/02 8:00 AM	1
2		0	2/4/02 8:00 AM	1
3		0	2/18/02 8:00 AM	1
4		0	3/18/02 8:00 AM	1
5		45	2/4/02 8:00 AM	1
6		0	4/8/02 8:00 AM	1

In the fourth page of the **Import Spreadsheet Wizard** dialog box, you must determine which field will serve as the primary key field. Select **Let Access add primary key** if you don't want to be bothered with this determination. In such a case, Access will create an **ID** field that will serve as the primary key field for the data table. Click **Next** to continue.

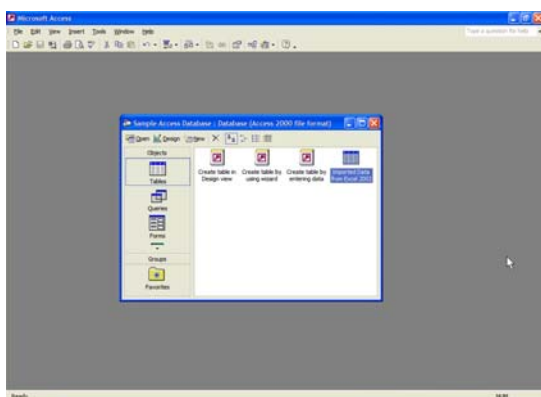
ID	Task #	Task Name
1	1	Soccer camp application Web page available
2	2	Application deadline
3	3	Acceptance notification
4	4	Payment due
5	5	Pre-camp conditioning
6	6	Soccer camp begins



In the fifth page of the **Import Spreadsheet Wizard** dialog box, type a name for the new Access table and click **Finish**.

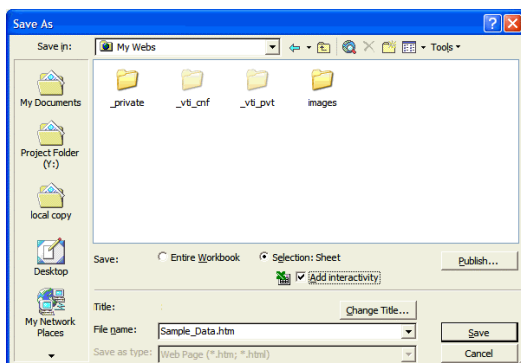


The following screen capture displays the Access 2002 Database window, with the newly created Excel table included.



Publish worksheets and workbooks to the Web


To publish an Excel 2002 worksheet or workbook to the Web, click **File => Save as Web Page...**

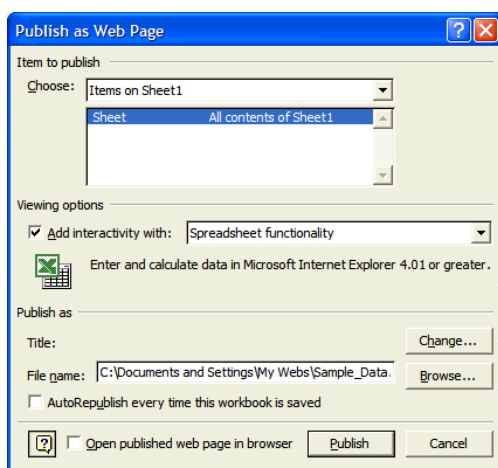


In the **Save As** dialog box, use the Places bar or the **Save in:** drop-down list box to browse to the destination Web folder for the Web page. Alternatively, you can type a Uniform Resource Locator (URL) in the **File name:** box to publish the page directly to a Web server (assuming that you have appropriate permissions to the folder on the Web server). Select either **Entire Workbook** or **Selection:Sheet** to publish either the entire Excel 2002 file or only the active sheet.



Assuming that the Web site visitors who will be viewing your Excel Web page have the Office Web Components installed in their browsers, you can enable interactivity to allow them to manipulate the Excel worksheet or workbook information. Select the

Add interactivity check box  ☒ **Add interactivity** to enable this option. Click **Publish...** to specify Web publishing options.



In the **Publish as Web Page** dialog box, use the **Choose:** drop-down list box to select which sheet (or which parts of which sheet) you want to publish to the Web. Under **Viewing options**, open the **Add interactivity with:** drop-down list box to specify the desired level of Web interactivity. The two options are **Spreadsheet functionality** and **PivotTable functionality**. Under **Publish as**, click **Change...** to change the title of the Web page as it will appear in a Web browser window. Enable the **Open published web page in browser** check box to have Excel automatically load the Excel Web page into your default Web browser as soon as you press **Publish**.



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The following screen capture shows sample Excel 2002 data as viewed in the Internet Explorer 6 Web browser, with the Office Web Components installed. Note that you can use the Web Components toolbar to perform many of the same operations on the data as you can from within Excel 2002.

	Name	Title	Reports_To	Department
1	Jossef Goldberg	President & CEO		Office of the President
2	Suzan Fine	Executive Assistant	Jossef Goldberg	Office of the President
3	Clair Hector	COO	Jossef Goldberg	Operations
4	Anthony Chor	Executive Assistant	Clair Hector	Operations
5	Laura Jennings	CFO	Jossef Goldberg	Finance
6	John Tippett	Executive Assistant	Laura Jennings	Finance
7	Thom McCann	Senior VP Production	Jossef Goldberg	Production
8	Ken Bergman	Executive Assistant	Thom McCann	Production
9	Mike Triano	Executive Assistant	Ashley Larsen	Marketing
10	Ashley Larsen	Senior VP Sales & Mktg	Jossef Goldberg	Sales
11	Eric Lang	Corporate Counsel	Clair Hector	Operations
12	Linda Leslie	Treasurer	Laura Jennings	Finance
13	Ketan Dalal	Secretary	Linda Leslie	Finance
14	Nate Sun	A/R Manager	Suki White	Finance
15	Andrew Dixon	A/R Manager	Suki White	Finance
16	Sean Chai	Associate Council	Eric Lang	Operations
17	Fukiko Ogisu	International Liaison	Ashley Larsen	Sales
18	Helmut Hornig	North America Sales Manager	Ashley Larsen	Sales
19	Jae Pak	National Account Manager	Helmut Hornig	Sales
20	Denise Smith	National Account Manager	Helmut Hornig	Sales
21	Kimberly Bowen	Internal Sales Representative	Helmut Hornig	Sales
22				

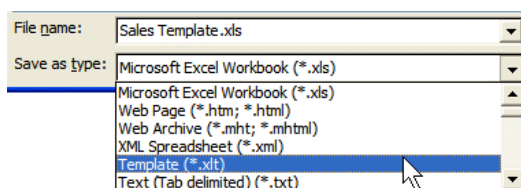
Managing Workbooks

Create, and edit templates

A *template* is simply a predefined set of formatting, macros, options, and, in some cases, boilerplate text that can be used over and over again. To create an Excel 2002 template, set up a workbook the way you want the template to appear each time that it is used and click **File => Save As....** In the **Save As** dialog box, open the **Save as type:** drop-down list box and select **Template (*.xlt)** from the list. Note that ordinary Excel workbook files have the extension **.XLS**; Excel template files have the extension **.XLT**.



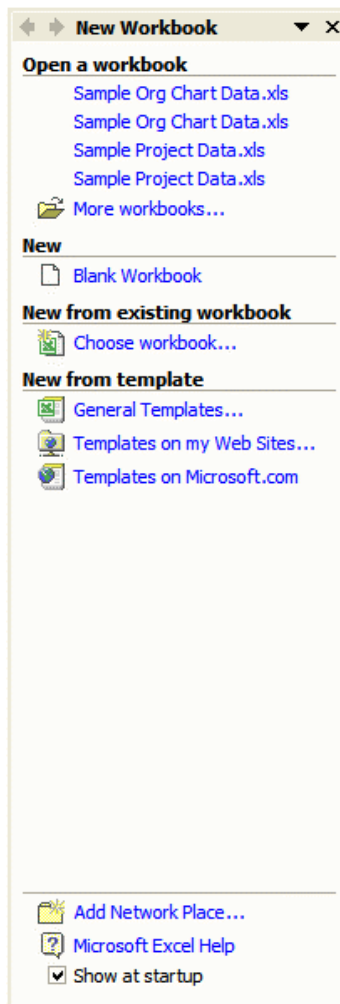
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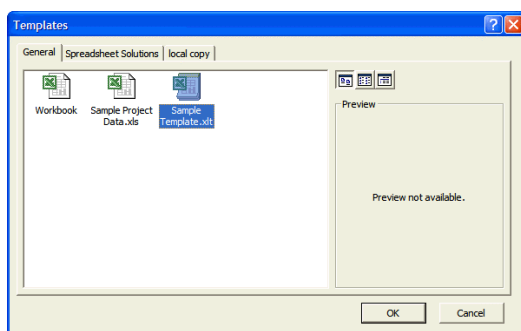
You should note that the view in the **Save As** dialog box automatically transports you to the default save location for Excel template files, which is

C:\Documents and Settings\user_name\Application Data\Microsoft\Templates

Name the template, click **Save**, and your new template is now ready for use. To use a template, click **File => New...** The **New Document** task pane will appear. (As long as the **Show at startup** check box is enabled at the bottom of the **New Document** task pane, the task pane will appear each time Excel is started by using its **Start** menu icon.)

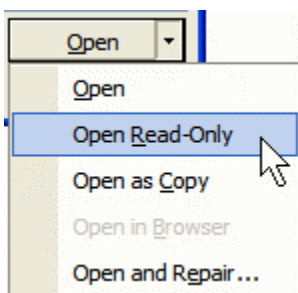


In the **New from template** list, select **General templates...** to view the templates that are available on your computer. Simply select the desired template and click **OK**. A new, unsaved Excel workbook file will be created based upon the selected template.



In the **New from template** list, select **Templates from my Web sites...** to view the templates that are available from a network or Internet location. In the **New from template** list, select **Templates on Microsoft.com...** to view the templates that are available from the Microsoft Web site.

To edit an existing Excel 2002 template, click **File => Open....** In the **Open** dialog box, ensure that **All Microsoft Excel Files** or **Microsoft Excel Files** is listed in the **Files of type:** drop-down list box. Next, use the Places bar and the **Look in:** drop-down list box to browse for the desired template. Finally, use the **Open** button drop-down list to determine how you want to open the template file. You can open the file with read/write access (the **Open** option), open the file read-only, open a copy of the template with read/write access, or open and repair a damaged Excel template file.



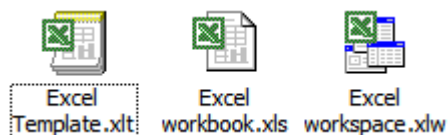


Create workspaces

Imagine you are working on two or more Excel workbooks simultaneously, and have them all arranged the way that you want them. When you close down for the day, do you want to have to manually open all two or more documents and then manually arrange them again each time that you start a work session? Of course not. That is where workspaces come in. A *workspace* is a single file with an **.xlw** extension that stores all your view and position settings in one convenient place. Therefore, by launching your workspace file, Excel will automatically open all associated workbooks and restore the viewing configuration to how it was when you saved your workspace file.

To create a workspace file, arrange your workbooks and viewing configuration the way you want it to look. Next, click **File => Save Workspace....** In the **Save Workspace** dialog box, name and store the file as you would any other Excel file. To use the workspace file, simply double-click it and watch the magic!

By the way, you should be noticing the slightly different appearance between Excel document files, template files and workspace files. Check out the following screen capture:



Consolidate data

Consolidating data in Excel simply means performing a calculation on data that resides on different worksheets of a single workbook. There are a few different ways to do this; however, because I got hosed on this part of the Excel 2002 Expert exam, I'm going to teach you the long way. However, the long way is the absolutely accurate way, so listen up! :)



Suppose we had a workbook with three sheets. On cell B8 of sheet3, we want to sum the range A1:A5 on sheet1 and the range C5-C10 on sheet2. This is the formula that you would need to perform this action:

=sum(sheet1!A1:A5,sheet2!C5-C10)

Note that references to other worksheets begin with *sheet_name!*, and are immediately followed by the desired cell address ranges. Remember to add the comma between different cell ranges. (If you are fuzzy on how to put together formulas in Excel, I refer you to my [Excel 2000 Core](#) and [Excel 2000 Expert](#) Cramsession study guides.) A formula that references data on multiple sheets in a workbook is known as a **3-D formula**.

Audit a Worksheet

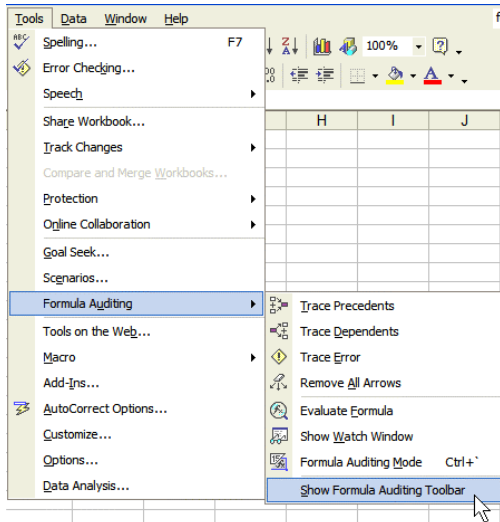
Check and review data/Audit a Worksheet

In the past, the exam objectives on the Microsoft Web site included both a "Check and review data" heading and the "Auditing a Worksheet" heading. This *must* have been a typo, because these topics cover the same information! In any case, I'm now going to teach you how to perform worksheet auditing in Excel 2002.

Formula auditing is simply the process of tracing the precedents and dependents of a particular formula cell, and of resolving formula errors. To perform formula auditing, it is helpful to have the Formula Auditing toolbar on screen. Click **Tools => Formula Auditing => Show Formula Auditing Toolbar**.



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Here is an annotated screen capture of the Formula Auditing toolbar.



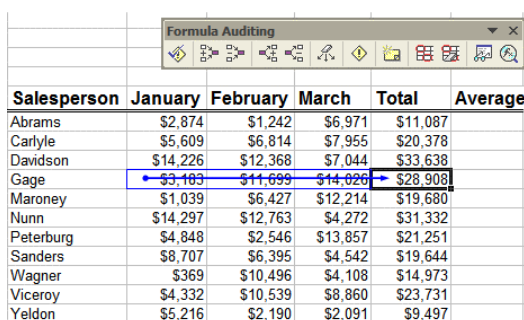
- A: Error Checking
- B: Trace Precedents
- C: Remove Precedent Arrows
- D: Trace Dependents
- E: Remove Dependent Arrows
- F: Remove All Arrows
- G: Trace Error
- H: New Comment
- I: Circle Invalid Data
- J: Clear Validation Circles
- K: Show Watch Window
- L: Evaluate Formula



Find cells referred to in a specific formula

Cells that are referred to in a specific formula are known as **precedents**. To trace precedents for a formula, select the cell that contains the formula and click the **Trace Precedents** button on the Formula Auditing toolbar.

For example, in the following screen shot you can see the precedent cells that are referenced in the formula cell; the precedent cells are marked with a blue tracer arrow that points to the target cell.



Salesperson	January	February	March	Total	Average
Abrams	\$2,874	\$1,242	\$6,971	\$11,087	
Carlyle	\$5,609	\$6,814	\$7,955	\$20,378	
Davidson	\$14,226	\$12,368	\$7,044	\$33,638	
Gage	\$3,183	\$11,699	\$14,026	\$28,908	
Maroney	\$1,039	\$6,427	\$12,214	\$19,680	
Nunn	\$14,297	\$12,763	\$4,272	\$31,332	
Peterburg	\$4,848	\$2,546	\$13,857	\$21,251	
Sanders	\$8,707	\$6,395	\$4,542	\$19,644	
Wagner	\$369	\$10,496	\$4,108	\$14,973	
Viceroy	\$4,332	\$10,539	\$8,860	\$23,731	
Yeldon	\$5,216	\$2,190	\$2,091	\$9,497	

To clear the tracer arrows, click the **Remove Precedent Arrows** or **Remove All Arrows** buttons on the Formula Auditing toolbar.

Find formulas that refer to a specific cell

A **dependent** is a formula that refers to a specific cell. To view all formulas that reference a given cell, select that cell and click the **Trace Dependents** button on the Formula Auditing toolbar. For example, in the following screen capture cells C13 and E7 contain formulas that refer to the selected cell, which is cell C7.

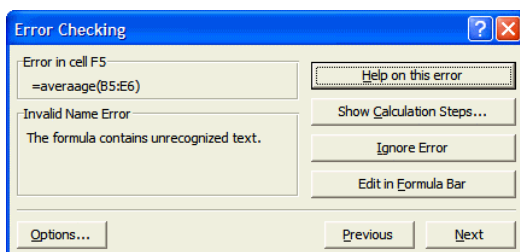


	A	B	C	D	E	F
1	Salesperson	January	February	March	Total	Average
2	Abrams	\$2,874	\$1,242	\$6,971	\$11,087	
3	Carlyle	\$5,609	\$6,814	\$7,955	\$20,378	
4	Davidson	\$14,226	\$12,368	\$7,044	\$33,638	
5	Gage	\$3,183	\$11,699	\$14,026	\$28,908	
6	Maroney	\$1,039	\$6,427	\$12,214	\$19,680	
7	Nunn	\$14,297	\$12,763	\$4,272	\$31,332	
8	Peterburg	\$4,848	\$2,546	\$13,857	\$21,251	
9	Sanders	\$8,707	\$6,395	\$4,542	\$19,644	
10	Wagner	\$369	\$10,496	\$4,108	\$14,973	
11	Viceroy	\$4,332	\$10,539	\$8,860	\$23,731	
12	Yeldon	\$5,216	\$2,190	\$2,091	\$9,497	
13	Total		\$83,479			

To clear the tracer arrows, click the **Remove Dependent Arrows** or **Remove All Arrows** buttons on the Formula Auditing toolbar.

Find errors

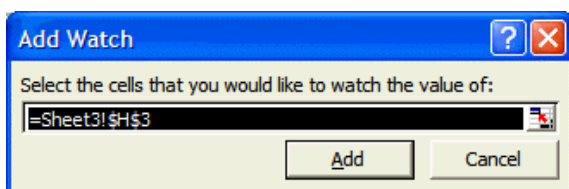
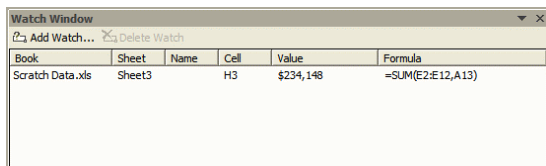
To scan an Excel 2002 worksheet for formula errors, click the **Error Checking** button on the Formula Auditing toolbar. Alternatively, click **Tools => Error Checking...**



The **Error Checking** dialog box will display each cell whose formula displays an error. You then have the option of getting online help regarding the error, stepping into the formula one step at a time, ignoring the error or manually correcting the error by using the Excel 2002 formula bar.

If you already know which cell contains an error, you can use the **Trace Error** button on the Formula Auditing toolbar to have Excel draw tracer arrows that reveal the cell's associated precedent and/or dependent cells.

The **Watch Window** dialog box is pretty cool when you want to observe both the underlying formula as well as the formula result for a cell when you are troubleshooting formula errors. To invoke the Watch Window, select the appropriate cell and click the **Watch Window** button on the Formula Auditing toolbar.

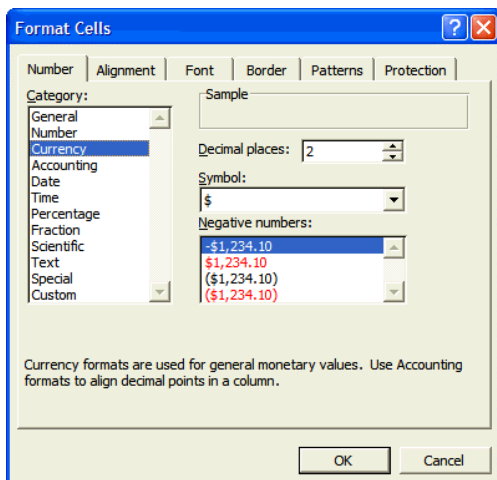


From within the **Watch Window** dialog box, click **Add Watch...** In the **Add Watch** dialog box, ensure that the appropriate cell is selected and click **OK**.

Formatting Numbers

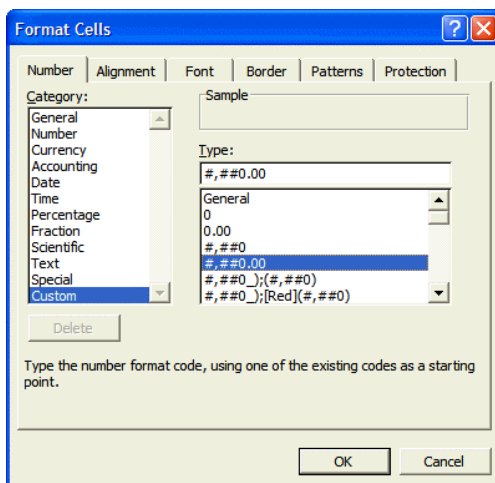
Create and apply custom number formats

You can format your numbers in Excel any way that you want to. Simply select the appropriate cells and click **Format => Cells...** Alternatively, right-click within the selected cell range and select **Format Cells...** from the shortcut menu.





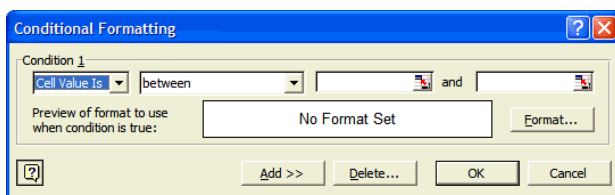
The **Number** tab of the **Format Cells** dialog box is where you can specify your custom number formats. You can start with a number type by making a selection from the **Category:** list box. Next, you can customize how your numbers are displayed by manipulating the other formatting controls. For example, in the screen shot above, my numbers will appear in **Currency** style, with two decimal places, a dollar symbol, and with negative numbers displayed with a minus sign. Use the **Custom** category to create your own number formats. (Beware, the **Custom** category is not for the faint of heart: you will need to study Excel's number format codes closely to get the hang of how they structure number formats. Run a search in Excel 2002 online help for "number format codes" for more information.)





Use conditional formats

To apply conditional formatting to cells, select the appropriate cell range and click **Format => Conditional Formatting...**

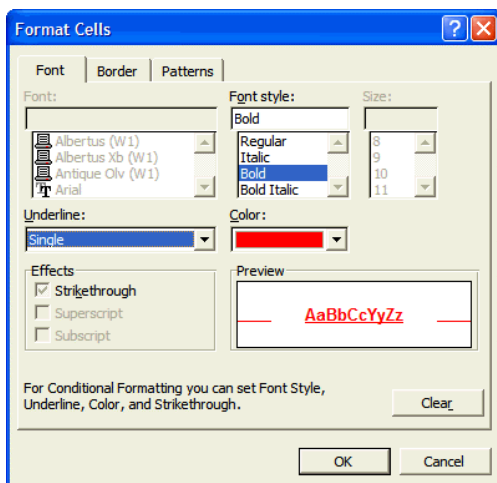


In the **Conditional Formatting** dialog box, you are basically constructing an IF...THEN formula. If a particular cell value meets a predefined criterion or multiple criteria, then you will instruct Excel to format the cell data a certain way. To begin, open the first drop-down list box. The first condition will be based on either a cell value or a formula. Assume we are using a cell value for the sake of this example.

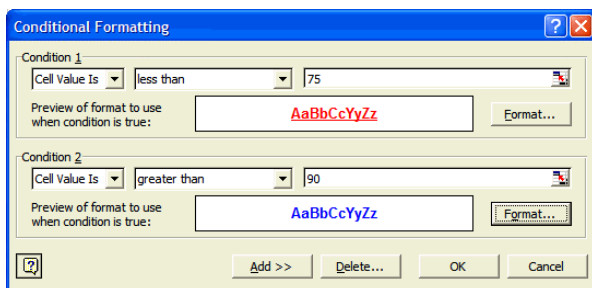
Next, open the second drop-down list box. These are what are known as *Boolean operators*. Select the appropriate Boolean operator and proceed to the next boxes. For **between** there will obviously be two text boxes; for other operators, such as **greater than** or **less than**, there will be only one text box. Type your condition into this area and click **Format...**



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The **Format Cells** dialog box that appears only allows you to modify certain formatting properties, such as font style, underline, and color. After you have made your changes, click **OK** to close the **Format Cells** dialog box and click **OK** again to close the **Conditional Formatting** dialog box. The following screen capture shows a sample conditional format such that numbers less than 75 will display in bold, red, and underline, while numbers greater than 90 will display in bold and blue.





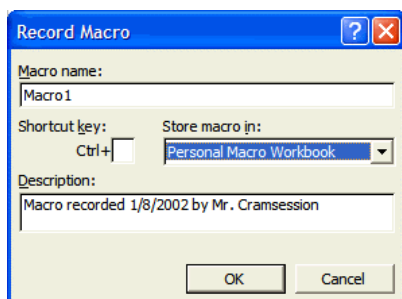
Oh yeah, I almost forgot to mention this: use the **Add >>** button to add multiple conditions. You can have up to 3 conditions in an Excel 2002 conditional format.

Student	Readin'	Writin'	Rithmetic	Overall Average
Candi	80	99	98	92
Eddie	75	55	47	59
Heather	41	58	80	60
Susie	84	66	56	69
Timmy	68	82	90	80
Tommy	91	94	90	92

Using Macros

Create and record macros

A *macro* is simply a sequence of actions that are recorded for easy playback. Macros save you time because you can condense multi-step procedures into a single easy click of the mouse. To record a macro in Excel 2002, click **Tools => Macro => Record New Macro....**

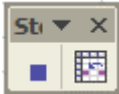


In the **Record Macro** dialog box, name the macro, assign an optional shortcut key and add an optional short description of what functionality the macro provides. An important question is where you are going to store the macro. Open the **Store macro in:** drop-down list box. Select **This workbook** if you want to attach the macro to the current workbook. Select **New workbook** if you want to attach the



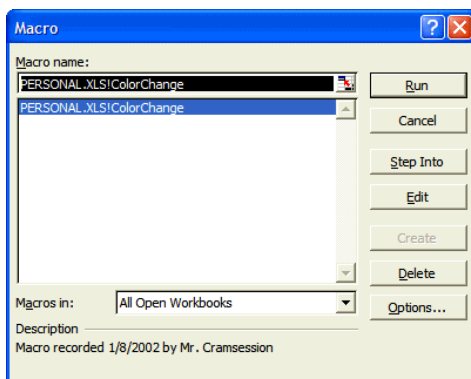
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macro to another, blank workbook. Select **Personal Macro Workbook** if you want to make the macro available to all new workbooks that are based on the global template. Click **OK** to continue.



Carry out the steps of your macro by using the keyboard as much as possible (the macro recorder may not pick up mouse clicks). Use the **Relative Reference** button on the **Stop Recording** toolbar to instruct Excel to run the macro relative to the position of the active cell. Click **Stop Recording** when you are finished.

To run a macro, use the keyboard shortcut (if you remember it!), or click **Tools => Macros => Macros....** In the **Macros** dialog box, select the appropriate macro from the list and click **Run**.



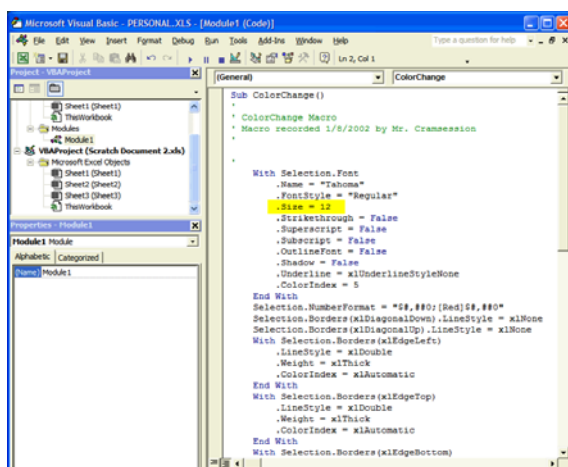
To delete any macros that you create, open the **Macros** dialog box, select the macro and click **Delete**.




Edit macros

Don't worry, don't worry: you are not required to know any Visual Basic for Applications (VBA) code in order to pass the Excel 2002 Expert MOUS exam. But you *are* required to know how to get into and out of the Visual Basic Editor, as well as how to make minor changes to the code. To edit a macro, open the **Macros** dialog box, select the macro and click **Edit**.

Although it looks daunting if you have never worked with programming code before, for the purposes of the exam, it really isn't that bad. All you will be asked to do is to make some very minor change, such as changing the font from Times New Roman to Tahoma or changing the font size from 10 to 12. In fact, the following screen capture shows where you would go in macro code to change the font size. The font name is two lines above what I've highlighted.



When you have finished making your changes, click the **Save** button  in the Visual Basic Editor, and then click **File => Close and Return to Microsoft Excel**. There. That wasn't so bad, was it? :)



Working with Ranges

Use named ranges in formulas

Recall from the Excel 2002 Core material that you can name a cell range by selecting the range, clicking within the **Name** box on the Formula bar, typing a name (without spaces) and pressing **ENTER**. Now let us consider how to use named ranges in formulas.

Basically, you can either type the range names in your formulas, or you can select the cell ranges with your mouse. When you select the cell ranges, Excel will automatically substitute the range names for the cell addresses. Consider the following example:

E12	fx =AVERAGE(AVGReading,AVGWriting,AVGRithmetic)				
	A	B	C	D	E
4					
5	Student	Readin'	Writin'	Rithmetic	Overall Average
6	Candi	80	99	98	92
7	Eddie	75	55	47	59
8	Heather	41	58	80	60
9	Susie	84	66	56	69
10	Timmy	68	82	90	80
11	Tommy	91	94	90	92
12	Averages	73	73	73	73

In the above example, named ranges were created for the ranges B6:B11 (AVGReading), C6:C11 (AVGWriting), and D6:D11 (AVGRithmetic). The AVERAGE formula in cell E12 uses these named ranges in its calculation, as can be viewed in the Formula bar. It is important to note that named cell ranges are separated by a comma, not a colon (:).



Use Lookup and Reference functions

Let's look at the VLOOKUP (vertical lookup) and HLOOKUP (horizontal lookup) functions, shall we? To get an idea on how lookup functions work, consider the following table:

To calculate Allen's commission bonus in cell F3, we will need to lookup up his total commissions for QTR 1 (cell E3) in the lookup table located in the cell range H3:I9. It looks as though his total will generate a bonus of 4%. See how the function works? Specifically, the syntax of the VLOOKUP function is

=VLOOKUP(lookup_value,table_array,col_index_num), where

lookup_value is the cell address of the value being looked up (E3)

table_array is the cell range of the lookup table (H3:I9)

col_index_num is the column number containing the return value (2)



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Therefore, in this example we need the function **=VLOOKUP(E3,H3:I9,2)** to derive Allen's commission bonus. Of course, we can then use the formula **=(E3*F3)+E3** in order to compute Allen's adjusted total commission income in cell G3.

The HLOOKUP function works identically to the VLOOKUP function; the only difference is that we are dealing with a horizontal data table instead of a vertical data table. Consider the following example (it should look pretty familiar to you!)

ABC Company: Employee Commissions QTR 1 2001						
Salesperson	January	February	March	Total	Bonus	Adj. Total
Allen	\$2,874	\$1,242	\$7,000	\$11,116		
Carlyle	\$5,609	\$6,814	\$7,955	\$20,378		
Davis	\$14,226	\$12,368	\$7,044	\$33,638		
Gage	\$3,183	\$11,699	\$14,026	\$28,908		
Maroney	\$1,039	\$6,427	\$12,214	\$19,680		
Nagurney	\$14,297	\$12,763	\$6,975	\$34,035		
Peterburg	\$5,100	\$2,546	\$13,857	\$21,503		
Sanders	\$8,707	\$6,395	\$4,542	\$19,644		
Wagner	\$1,245	\$10,496	\$4,108	\$15,849		
Viceroy	\$4,332	\$10,539	\$8,860	\$23,731		
Yeldon	\$5,216	\$926	\$2,091	\$8,233		
Total	\$65,828	\$82,215	\$88,672	\$236,715		
Sales	5,000	10,000	15,000	20,000	25,000	30,000
Bonus	2%	4%	6%	8%	10%	12%

In this case let's compute Davis' bonus. Note that his total pre-bonus commission is located in cell E5, and the lookup range is now located in the range B17:H18. Therefore, the formula that we need is

=HLOOKUP(E5,B17:H18,2)

Therefore, Davis' bonus is 12%. Lookup functions are pretty cool, aren't they?



Now let's look at the standard-issue LOOKUP function. LOOKUP differs from VLOOKUP and HLOOKUP in that with LOOKUP you are providing the lookup value from within the formula. The syntax of the LOOKUP function is

=LOOKUP(lookup_value,lookup_vector,result_vector), where

lookup_value is the value being looked up in a lookup table.

lookup_vector is the cell range that is being referenced against the lookup value.

result_vector is the cell range that contains the value associated with the lookup value. The result_vector range must be the same size as the lookup_vector range.

A quick example: what would be the return value if we used the function **=LOOKUP(24,000,A2:A8,B2:B8)** with the data in the following screen capture?



The screenshot shows the Microsoft Excel 2002 interface. The spreadsheet has two columns: 'Sales' in column A and 'Bonus' in column B. The data is as follows:

	A	B	C
1	Sales	Bonus	
2	5,000	2%	
3	10,000	4%	
4	15,000	6%	
5	20,000	8%	
6	25,000	10%	
7	30,000	12%	
8	35,000	14%	
9			
10			

The status bar at the bottom indicates 'NUM'.

You got it: **8%**. Good job.

In terms of reference functions, they are a strange lot, to say the least. Reference functions reference row numbers, column numbers, or area numbers. I'm just going to give you the syntax of the major reference functions in a sort of scattergun style:

The ROW function returns the row number of a given reference. For example, the function **=ROW(A25:C55)** returns the value 25.

The ROWS function returns the number of rows involved in a reference or cell array. For example, the function **=ROWS(A1:B4)** returns the value 4.



The COLUMN function returns the column number of a given reference. For example, the function **=COLUMN(D145:E220)** returns the value 4.

The COLUMNS function returns the number of columns involved in a reference or cell array. For example, the function **=COLUMNS(H11:O20)** returns the value 8.

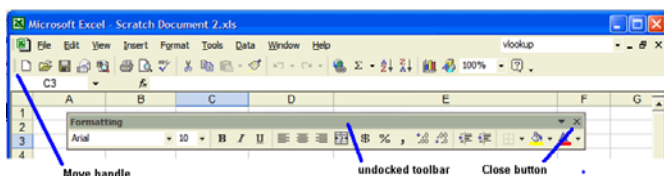
The AREAS function returns the number of contiguous cell ranges referenced. For example, the function **=AREAS(A1:C3,D1:D3,E1:E3)** returns the value 3.

Just because I have never used these reference functions, or ever foresee using them (do they seem unnecessary to you?), I provided you with them to ensure that I have fully covered the objectives of the Excel 2002 Expert MOUS exam.

Customizing Excel

Customize toolbars and menus


To move or undock a toolbar, simply click and drag it by its move handle. The move handle is the ridge that runs along a toolbar's leftmost side.

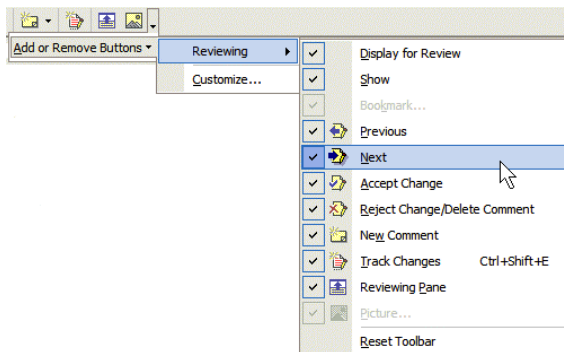


When a toolbar is undocked, it can be closed by clicking the **Close** button (except for the Menu toolbar). You can always show or hide toolbars by clicking **View =>**



Toolbars, and making the appropriate selection(s) from the submenu. Toolbars can be docked on any side of the Excel interface: top, bottom, left or right. It's all good.

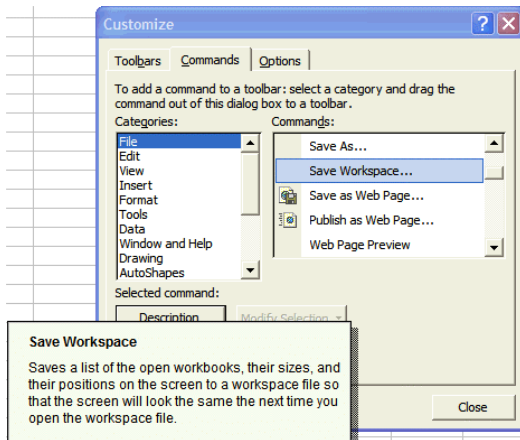
Now how about adding or removing buttons? Well, for that you need only click the **Toolbar Options** arrow  and then click **Add or Remove Buttons**. Simply select or deselect any button from the submenu; click **Reset Toolbar** to reset the toolbar to the factory default configuration. Click **Customize** to open the **Customize** dialog box...we will get to that a bit later.



The **Toolbar Options** arrow and the **Add or Remove Buttons** menu is such a wonderful addition to the Office XP products. In prior versions, you had to work strictly from within the confines of the **Customize** dialog box, which was a tedious and non-intuitive affair. Speaking of which, why don't we open the **Customize** dialog box right now and see what treasures it has to offer? Another way of doing this is by clicking **Tools => Customize...**



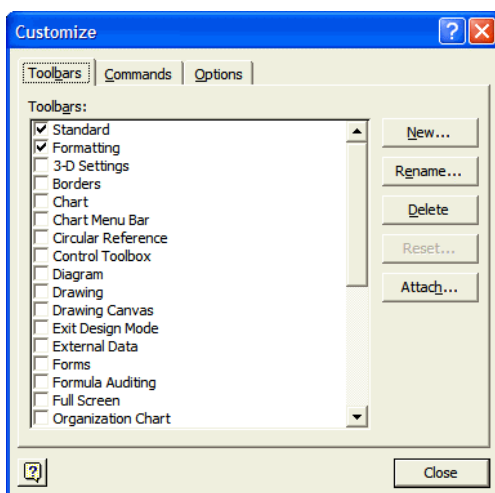
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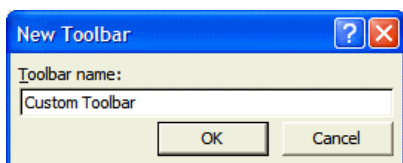
On the **Commands** tab of the **Customize** dialog box, you can select a category and then click and drag a command to a toolbar or to a menu. To add a command to a menu, just hover your mouse over the menu- the menu will then expand, allowing you access to its contents. By the way, you can also drag any existing toolbar button or menu command into the document area to get rid of it. Click **Description** to invoke a short description of a command. The above screen capture shows the description text for the **Save Workspace** command.



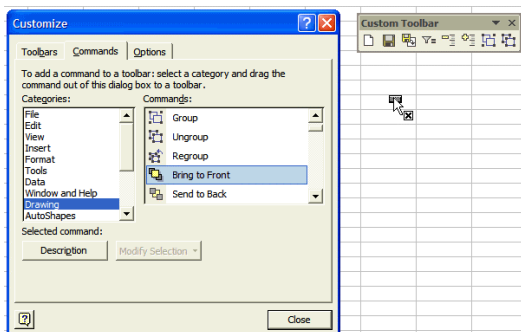
Now let's create a new toolbar. Navigate to the **Toolbars** tab, and click **New....**



In the **New Toolbar** dialog box, type the name of your new toolbar and click **OK**.

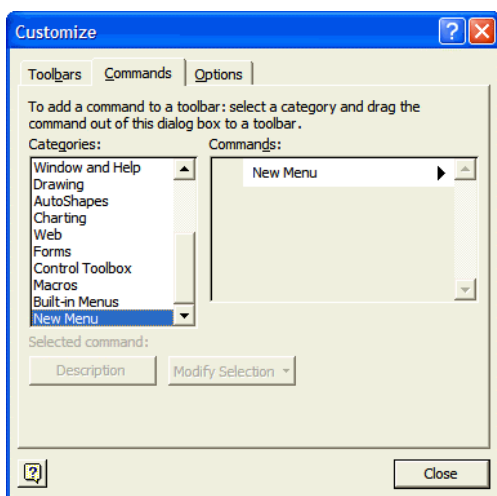


Now comes the fun part. Navigate to the **Commands** tab and simply begin dragging toolbar buttons on to your new toolbar. You can dock, undock your toolbar as you wish. By default, the new toolbar will be available in the Normal template, and will thus be available for all of your new documents.



The **Toolbars** tab of the **Customize** dialog box is also where you manage toolbars, in case you haven't already guessed. Check or uncheck any toolbar to show or hide each toolbar, respectively. Select a built-in toolbar and click **Reset** to reset the toolbar to its factory defaults. Select any of your own homemade toolbars and click **Delete** to, well, delete the toolbar.

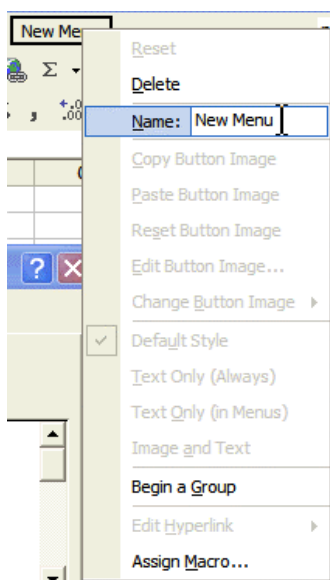
To create a new menu, navigate to the **Commands** tab of the **Customize** dialog box, select **New Menu** from the **Categories:** list box, and select the **New Menu** command to the appropriate location on the Excel 2002 Menu bar.





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To add commands to the menu, select the commands from the **Commands** tab and drag them up into the new menu. To rename the menu, right-click the menu name. In the **Name:** text box, enter the new name. Place an ampersand (&) character before the letter that you want to serve as the hotkey for the menu.

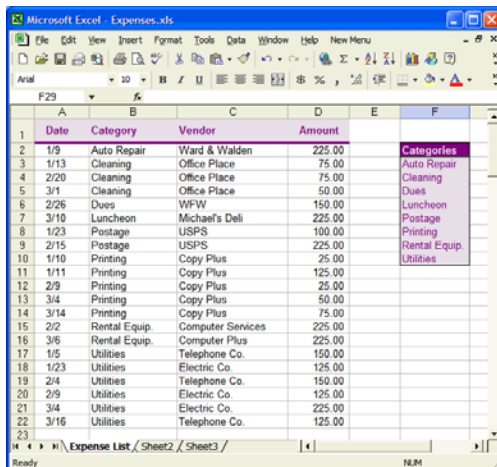




Summarizing Data


Use subtotals with lists and ranges

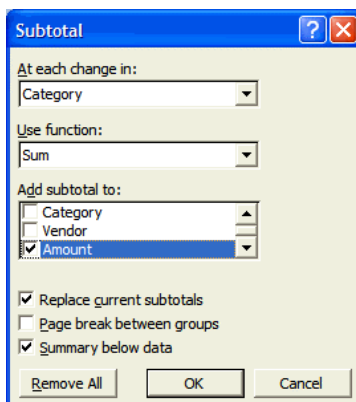
Subtotals are a great way to summarize data. For example, consider the following list:



	A	B	C	D	E	F
	Date	Category	Vendor	Amount		Categories
1						
2	1/9	Auto Repair	Ward & Walden	225.00		Auto Repair
3	1/13	Cleaning	Office Place	75.00		Cleaning
4	2/20	Cleaning	Office Place	75.00		Dues
5	3/1	Cleaning	Office Place	50.00		Luncheon
6	2/26	Dues	WFW	150.00		Postage
7	3/10	Luncheon	Michael's Deli	225.00		Printing
8	1/23	Postage	USPS	100.00		Rental Equip.
9	2/15	Postage	USPS	225.00		Utilities
10	1/10	Printing	Copy Plus	25.00		
11	1/11	Printing	Copy Plus	125.00		
12	2/9	Printing	Copy Plus	25.00		
13	3/4	Printing	Copy Plus	50.00		
14	3/14	Printing	Copy Plus	75.00		
15	2/2	Rental Equip.	Computer Services	225.00		
16	3/6	Rental Equip.	Computer Plus	225.00		
17	1/5	Utilities	Telephone Co.	150.00		
18	1/23	Utilities	Electric Co.	125.00		
19	2/4	Utilities	Telephone Co.	150.00		
20	2/9	Utilities	Electric Co.	125.00		
21	3/4	Utilities	Electric Co.	225.00		
22	3/16	Utilities	Telephone Co.	125.00		
23						

Wouldn't it be nice to get subtotals for each category, considering that there are several separate entries for each category? Here's how to do subtotals. First, ensure that you have an Excel *list* (contiguous "block" of data, with first row set off in formatting from the rest of the data). Second, select a cell within the list and click

the **Sort Ascending** button . Finally, click **Data => Subtotals....**





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In the **Subtotal** dialog box, open the **At each change in:** drop-down list box and select the column that you want to break up by using subtotals. In this examples, it is **Category**. Next, Open the **use function:** drop-down list box and decide what kind of function you want to apply. You can choose SUM, AVERAGE, MIN, MAX and several other functions. Finally, in the **Add subtotal to:** option list, select which column contains the data that you are going to perform arithmetic on. In this example, the data is located in the **Amount** column. The following screen shot shows the previously displayed list summarized with subtotals.

	Date	Category	Vendor	Amount
1				
3		Auto Repair Total		225.00
7		Cleaning Total		200.00
9		Dues Total		150.00
11		Luncheon Total		225.00
12	1/23	Postage	USPS	100.00
13	2/15	Postage	USPS	225.00
14		Postage Total		325.00
20		Printing Total		300.00
23		Rental Equip. Total		450.00
30		Utilities Total		900.00
31		Grand Total		2,775.00

Pretty neat, eh? You can use the buttons to show or hide levels of detail in your subtotaled list. By the way, your list is now in what is called *outline format*. With subtotals, you have only outline levels 1 and 2 (which can be shown or hidden by using the buttons).

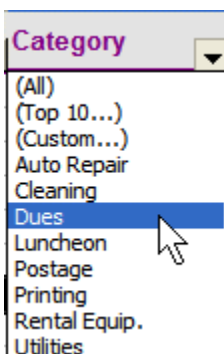
You can apply subtotals to ranges as well as to entire lists. Just remember to perform an ascending sort first, and select the range before applying subtotals.


To remove subtotals from a list, select a cell within the list, invoke the **Subtotal** dialog box and click **Remove All**.



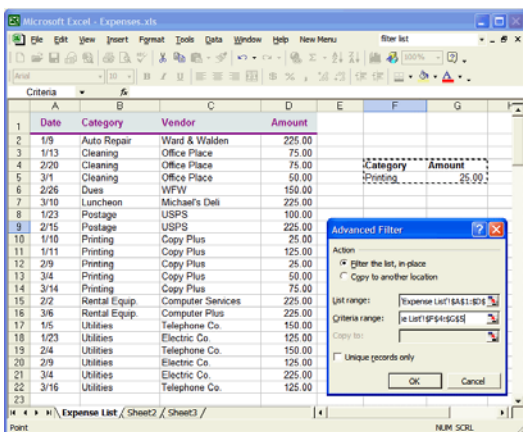
Define and apply filters

To apply a quick filter (also called an AutoFilter) to a list, select a cell within the list and click **Data => Filter => AutoFilter**.



Use the filter arrows  for any column that you want to filter. To remove a filter, select **(All)** from the filter list. Alternatively, click **Data => Filter => AutoFilter**.

One limitation of the AutoFilter is that you can filter by only a single column. To perform an advanced filter, click **Data => Filter => Advanced Filter....** Here is the confusing part, for those who are not "in the know": you actually have to use some free space on the worksheet to *construct your own query table*! Strange, but effective. Check out the following screen capture.



In the **Advanced Filter** dialog box, use the **Collapse Dialog** button in the **List range:** text box and select the list range. In this example, that range is A1:D22. Next, select the **Criteria range:** text box and select the range that comprises your homemade query table. Note that you must select the column headings as well as



the data, and the column headings must be spelled identically to the column headings in the list. In this example, the criteria range is F4:G5. Pressing **OK** executes the filter. (By the way, in the example I filtered for all records from the category **Printing** that also had an **Amount** value of 25.00.) You can create some pretty advanced filters this way, as the following example shows.

Date	Category	Amount
	Printing	25.00
	Postage	
2/9	Utilities	

To remove an advanced filter, click **Data => Filter => Show All**.

Add group and outline criteria to ranges

To outline a list, verify that you have sorted the list such that similar information occurs together. Also ensure that you have a summary row that Excel can use to outline your data. For example, consider the following list:

The screenshot shows an Excel spreadsheet titled "Microsoft Excel - Grouping and Outlining.xls". The data is organized into a table with columns: Cust. No., Salesperson, Item No., Qty., and Amt. Billed. The data is grouped by salesperson: Collins, Jones, Monson, and Simon. Each group has a summary row labeled "Total:" with a calculated sum of the "Amt. Billed" column. The formula bar shows the formula for the first summary row: =SUM(E6:E10) .

	Cust. No.	Salesperson	Item No.	Qty.	Amt. Billed
1	Matchless Candles, LLC				
2	Wholesale Sales Database				
5					
6	112	Collins	LJ005	157	2,200
7	112	Collins	J-3250	626	5,005
8	115	Collins	J-3250	1128	9,025
9	118	Collins	QS2C	738	8,854
10	118	Collins	PL-2093	149	2,005
11	Collins Total:				27,089
12	120	Jones	T-1200	446	4,458
13	120	Jones	QS2C	717	8,600
14	120	Jones	J-3250	1075	8,600
15	130	Jones	MR-239	278	5,000
16	130	Jones	LJ005	157	2,200
17	132	Jones	PL-2093	293	3,952
18	Jones Total:				32,810
19	132	Monson	LJ005	157	2,200
20	132	Monson	MR-239	139	2,500
21	135	Monson	QS2C	385	4,625
22	135	Monson	PL-2093	211	2,856
23	135	Monson	T-1200	903	9,025
24	144	Monson	QS2C	103	1,235
25	Monson Total:				22,441
26	144	Simon	PL-2093	343	4,625
27	150	Simon	PL-2093	293	3,952
28	152	Simon	J-3250	600	4,800
29	155	Simon	MR-239	278	5,005
30	160	Simon	T-1200	651	6,512

In the above screen capture, I used the SUM function to create summary rows that also serve as subtotals. Note that there exists a subtotal row beneath each break in



the **Salesperson** column. To have Excel create an outline for you automatically, select the list range and click **Data => Group and Outline => Auto Outline**.

Microsoft Excel - Grouping and Outlining.xls

File Edit View Insert Format Tools Data Window Help New Menu

Matchless Candles, LLC

Wholesale Sales Database

Cust. No.	Salesperson	Item No.	Qty.	Amt. Billed
Collins Total:				27,089
120	Jones	T-1200	446	4,458
120	Jones	QS2C	717	8,600
120	Jones	J-3250	1075	8,600
130	Jones	MR-239	278	5,000
130	Jones	LJ005	157	2,200
132	Jones	PL-2093	293	3,952
Jones Total:				32,810
Monson Total:				22,441
Simon Total:				40,169
Worrell Total:				33,290

Note that you can use the outline level buttons or the buttons to expand or collapse your outline. To remove the outline, select a cell within the outlined list and click **Data => Group and Outline => Clear Outline**.

You can manually group rows or columns, also. To do this, select the rows or columns to be grouped (see my Excel 2002 Core study guide if you require this procedure), and click **Data => Group and Outline => Group....** You will see that the grouped columns or rows behave as if there were outlined. To remove grouping from columns or rows, select those columns or rows and click **Data => Group and Outline => Ungroup....**

Use data validation

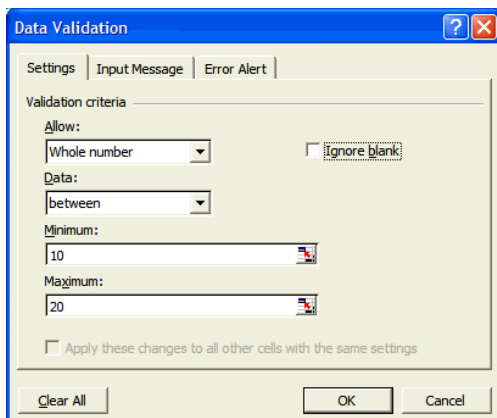
Data validation is cool. With it, you can force your users to enter consistent information when they are doing data entry on your worksheets. To perform data validation, select the cell that will be protected by data validation and click **Data => Validation....**

On the **Settings** tab of the **Data Validation** dialog box, open the **Allow:** drop-down list box and select what type of data you want to allow in the cell. Choices include **Whole number, Decimal, List, Date, Time** and **Text Length**. Select **Ignore blank** if you don't want Excel to display an error message if the user leaves the cell contents blank. Use the Boolean operators that are contained in the **Data:** drop-down list box to construct your constraint. For example, the following screen capture

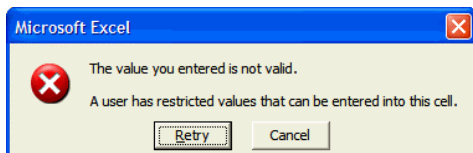


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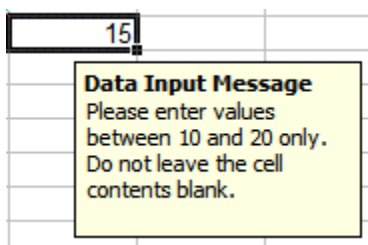
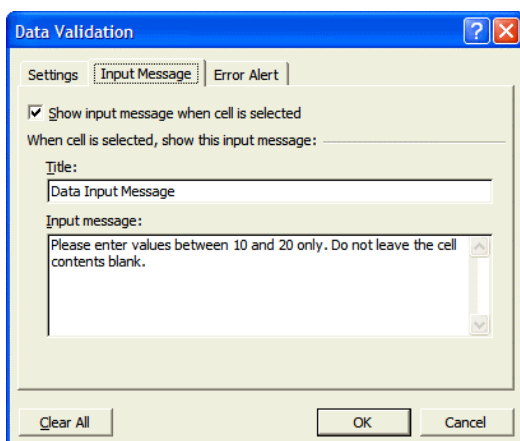
shows a data validation mechanism whereby only whole numbers between 10 and 20 are allowed. Any value outside of this range (including blank value cells) will produce an error message.



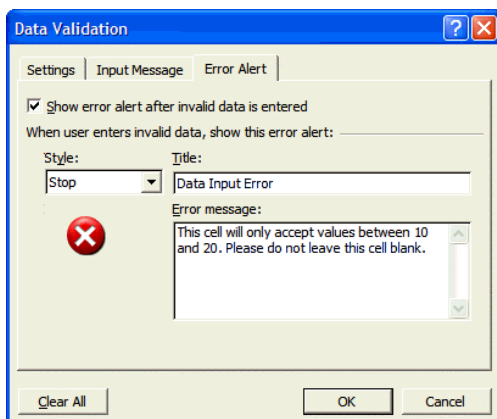
And here is the aforementioned error message:

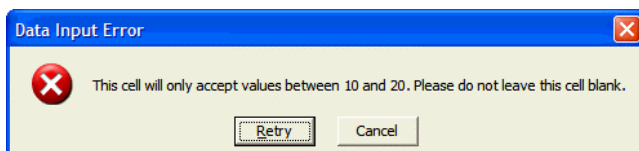


On the **Input Message** tab of the **Data Validation** dialog box, select **Show input message when cell is selected** if you want Excel to display ScreenTip text *as soon as a user enters the cell*. Note that this text will pop up before the user types anything in the cell! Use these messages sparingly, please, because they can tend to really annoy after awhile. The following two screen captures show the data validation setting and the resulting ScreenTip box for a sample input message.



Click the **Clear All** button on the **Input Message** tab of the **Data Validation** dialog box to clear out the message in "one fell swoop." Navigate to the **Error Alert** tab if you want Excel to produce a custom error message only if the user enters data that does not meet the predefined data validation requirements. You can select the system icon that is displayed by making a selection from the **Style:** drop-down list box. The **Title:** text box allows you to customize the dialog box's title bar. The **Error message:** box allows you to customize the dialog box message text.

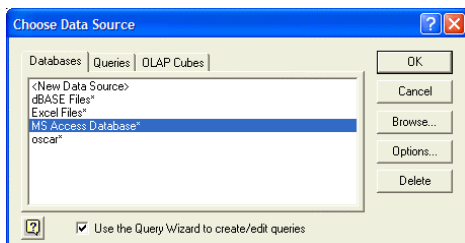




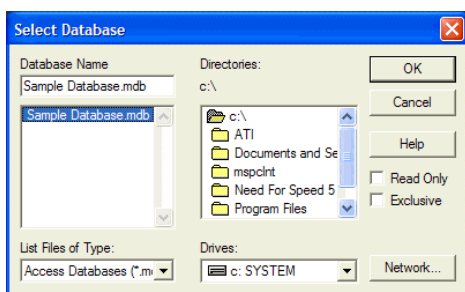
Retrieve external data and create queries

What we are going to do here is use Microsoft Query to access data stored in a Microsoft Access 2002 database. To begin, click **Data => Import External Data => New Database Query**. If you don't have the Microsoft Query add-in installed on your machine, you will be prompted to do so (you must have your Office XP installation CD-ROM handy to do this successfully).

In the **Choose Data Source** dialog box, select **MS Access Database*** and click **OK**.



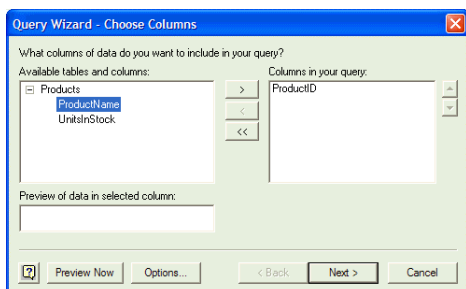
In the **Select Database** dialog box, use the directory list controls to locate the desired Microsoft Access database and click **OK**.



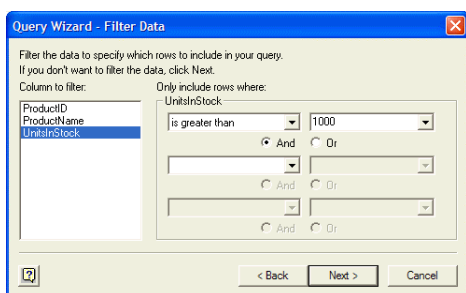
In the **Query Wizard-Choose Columns** dialog box, select each field from the target table that you want to import into Excel and use the arrow buttons to move them to the **Columns in your query** list box. Use the double-arrow buttons to move all fields at once. Click **Next>** to continue.



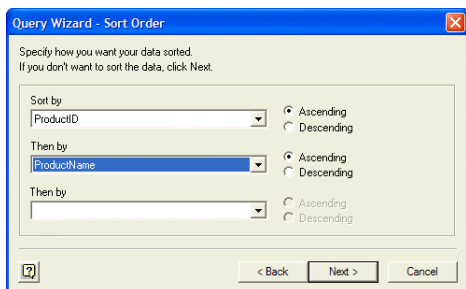
Microsoft MOUS Excel 2002 Expert



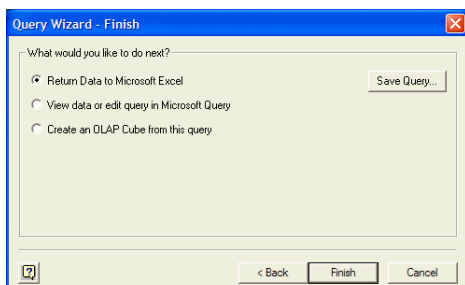
The **Query Wizard-Filter Data** is really where the actual querying takes place. Select your fields to be queried in the **Column to filter:** list box. Next, under **Only include rows where:**, set up a query condition. In the following example, only database records where the **UnitsInStock** field value is greater than 1000 will be imported into Excel. Click **Next>** to continue.



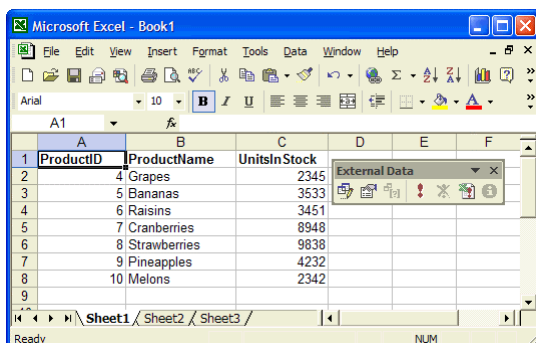
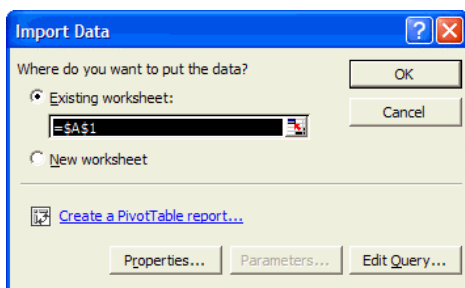
In the **Query Wizard-Sort Order** dialog box, you can specify up to three sorting criteria. In the following example, the Access table data will be sorted first by the **ProductID** field, and then by the **ProductName** field, both using an ascending (A to Z) sort order. Click **Next>** to continue.



In the **Query Wizard-Finish** dialog box, ensure that **Return Data to Microsoft Excel** is selected in the **What would you like to do next?** option list and click **Finish**.



Before you actually see your Access data in Excel, you must tell Excel where to place the imported information. You should be very, very familiar with the **Import Data** dialog box by now. Perhaps to the point of nausea.



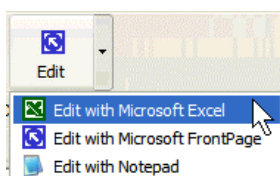
Create Extensible Markup Language (XML) Web queries

We have essentially performed this procedure in the "Importing Data to Excel" portion of this study guide. However, since as an instructor I feel that redundancy is a good way to drive a concept home, let's do it again! Basically an XML Web query is simply importing an HTML table into Excel. That's all there is to it. Forget about what you know about traditional database queries, such as those that you might perform in Access.

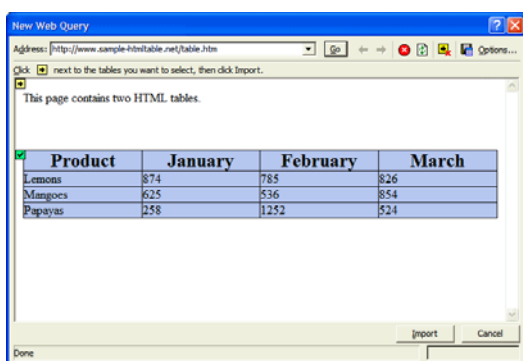



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To snag a Web table, we can go one of two routes: through the Microsoft Internet Explorer browser, or through the Excel interface. Let's go the browser road first. First, browse to the Web page that contains the table you want to import into Excel. Next, click the **Edit** button drop-down arrow on the Internet Explorer toolbar and select **Edit with Microsoft Excel**.

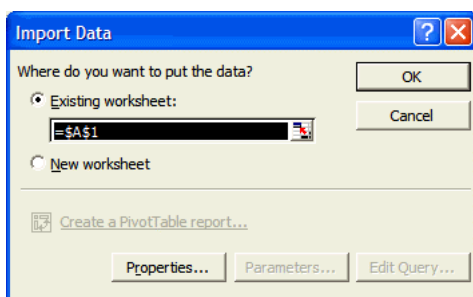


Excel will launch if it isn't already open, and the **New Web Query** dialog will appear with the Web page loaded.



The other way to do this is the method previously discussed: open Excel, click **Data => Import External Data => New Web Query....** Type the URL of the Web page in the **Address:** combo box and click **Go** to load the page. Use the  button to select the HTML table that you want to import into Excel and click **Import**.

In the **Import Data** dialog box, make the appropriate selections and click **OK** to import the HTML table data into Excel 2002.



Analyzing Data

Create a Microsoft PivotTable®, Microsoft PivotChart®, and PivotTable/PivotChart Reports

Microsoft is very proud of PivotTables. With fairly good reason, because they are an excellent way to summarize and dynamically view list data. Let's create a PivotTable, shall we?

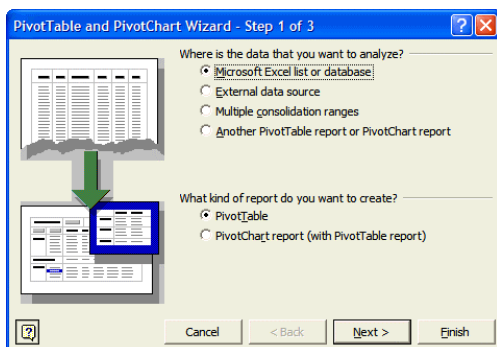
To illustrate this process, we are going to look at another example. Check out this list:


	A	B	C	D	E
	Cust. No.	Salesperson	Item No.	Qty.	Amt. Billed
5	112	Collins	LJ005	157	2,200
6	112	Collins	J-3250	626	5,005
7	115	Collins	J-3250	1128	9,025
8	118	Collins	QS2C	738	8,854
9	118	Collins	PL-2093	149	2,005
10	120	Jones	T-1200	446	4,458
11	120	Jones	QS2C	717	8,600
12	120	Jones	J-3250	1075	8,600
13	130	Jones	MR-239	278	5,000
14	130	Jones	LJ005	157	2,200
15	132	Jones	PL-2093	293	3,952
16	132	Monson	LJ005	157	2,200
17	132	Monson	MR-239	139	2,500
18	135	Monson	QS2C	385	4,625
19	135	Monson	PL-2093	211	2,856
20	135	Monson	T-1200	903	9,025
21	144	Monson	QS2C	103	1,235
22	144	Simon	PL-2093	343	4,625
23	150	Simon	PL-2093	293	3,952
24	152	Simon	J-3250	600	4,800
25	155	Simon	MR-239	278	5,005
26	160	Simon	T-1200	651	6,512
27	160	Simon	PL-2093	146	1,966
28	162	Simon	J-3250	251	2,005
29	162	Simon	QS2C	737	8,854
30	162	Simon	QS2C	204	2,450
31	166	Worrell	K-2038	727	8,000

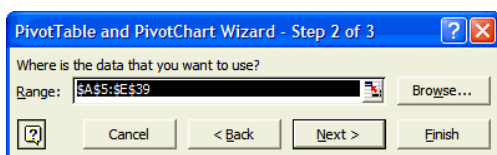


That's quite a bit of data to digest all at once, isn't it? Let's summarize it. To create a PivotTable, select a cell within your list range and click **Data => PivotTable and PivotChart Report....**

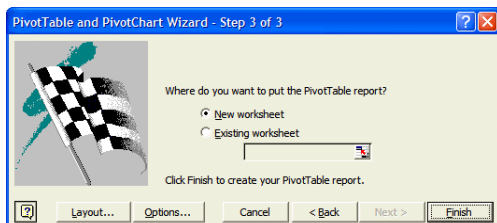
In the **PivotTable and PivotChart Wizard-Step 1 of 3** dialog box, ensure that **Microsoft Excel list or database** is selected for **Where is the data that you want to analyze?**, and that **PivotTable** is selected for **What kind of report do you want to create?**. Click **Next>** to continue.



The second step in the PivotTable wizard asks you to verify the list range. Click the **Collapse Dialog** button  to tuck the window out of the way and allow you to verify the range. If Excel guesses incorrectly, use your mouse to select the proper range. Click **Next>** to continue.



In step 3 of the PivotTable wizard you simply decide where you want Excel to place the new PivotTable, either on a new worksheet or embedded on the current worksheet. It is generally easier and cleaner to put the PivotTable on its own worksheet. Click **Finish** to continue.

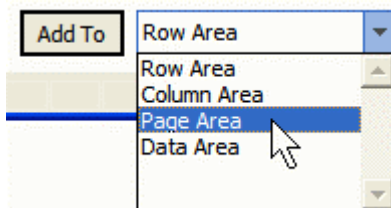
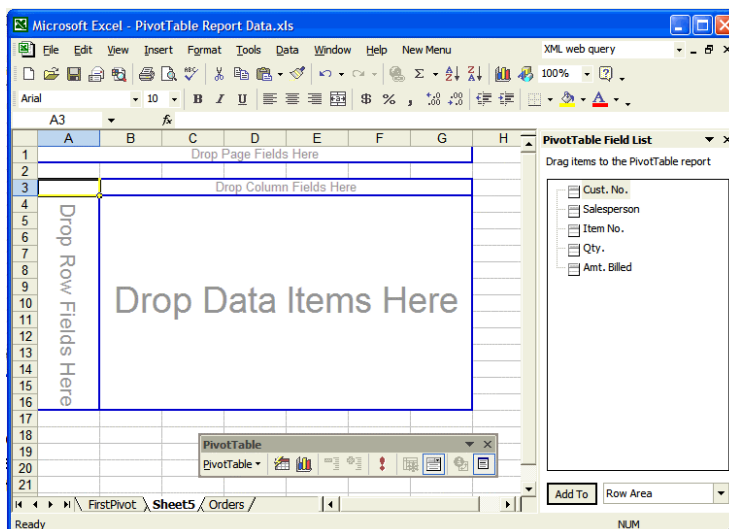




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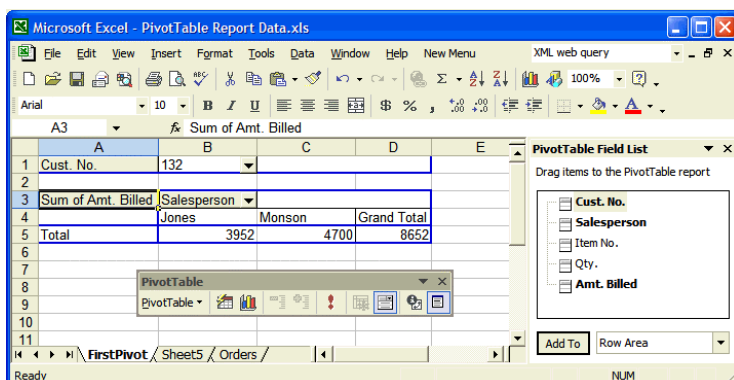
As you can see from the following screen capture, actually populating a PivotTable with data is a drag-and-drop affair. Simply select the appropriate fields from the **PivotTable Field List** and drop them in the appropriate field in the PivotTable. In this example, let's suppose that we want to summarize the data by customer number, showing the amount billed to each customer by each salesperson involved with the customer. To do this we need to drop the **Cust. No.** field to the **Drop Page Fields Here** area, drop the **Salesperson** field to the **Drop Column Fields Here** area, and drop the **Amt. Billed** field to the **Drop Data Items Here** area of the PivotTable report.

If you don't like all this dragging and dropping, there is another method. Select a field from the **PivotTable Field List**, select a PivotTable area from the drop-down list in the same sector and click **Add To**.






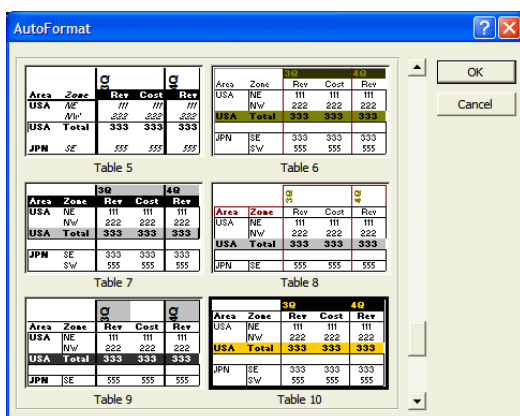
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Check out the above screen capture closely: notice how compact the data is. You can use the drop-down arrows for most PivotTable fields to filter data even further. In the above illustration, for example, we can open the **Cust No.** drop-down and select another customer number.

You can remove fields from a PivotTable by selecting the grey field labels and dragging them into an unused space on the worksheet. You can then select another field from the **PivotTable Field List** and build another PivotTable view.

To quickly format a PivotTable report, click the **Format Report** button  on the PivotTable toolbar. In the **AutoFormat** dialog box, select a style and click **OK**. Nothing more to it than that (at least for our purposes).



Now how about a PivotChart report? Follow the same procedure for creating a PivotTable report, with the exception that you should select **PivotChart report (with PivotTable report)** in step 1 of the PivotTable wizard.

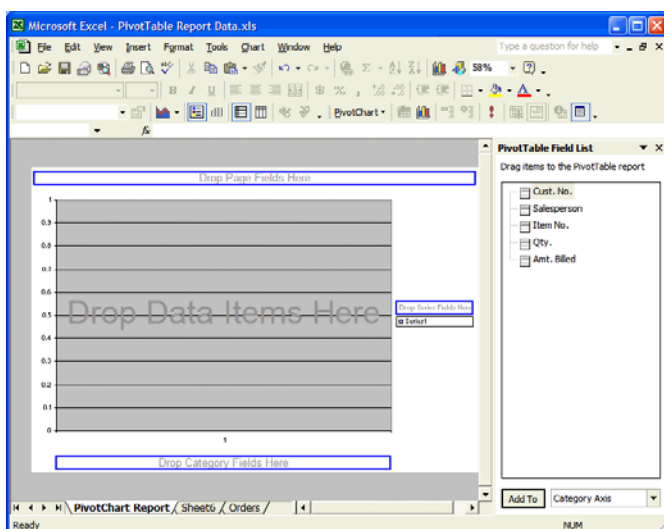


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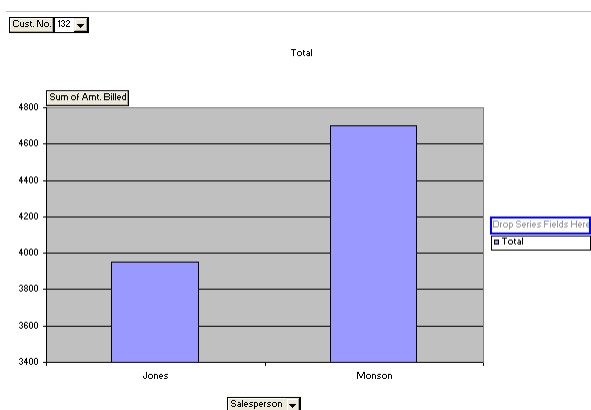
What kind of report do you want to create?

- ☐ PivotTable
- ☒ PivotChart report (with PivotTable report)

To add PivotTable fields to the PivotChart, follow the same procedure that was outlined previously.

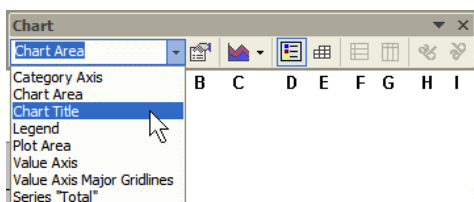


The following PivotChart (ugly though it is, in its raw, unformatted state) shows the very same view and data that the PivotTable in the previous portion of this document showed.






To format a PivotChart, use the Chart toolbar controls. Select a chart object from the **Chart Objects** drop-down list and then click **Format** to invoke the corresponding **Format** dialog box. Following is an annotated image of the Chart toolbar.



- A: Chart Objects
B: Format
C: Chart Type
D: Legend
E: Data Table
F: By Row
G: By Column
H: Angle Clockwise
I: Angle Counterclockwise

Oh yeah: one final note regarding PivotTable and PivotChart reports. When the underlying data changes in the source list, you may need to manually update the PivotTable or PivotChart data. Simply click **Refresh Data**  on the **PivotTable** toolbar.

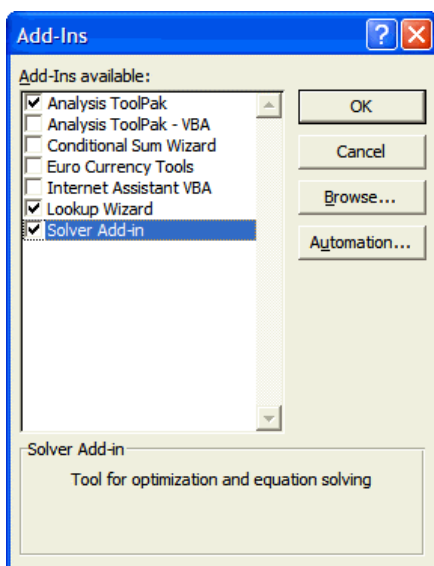
Forecast values with what-if analysis

We will discuss three what-if analysis tools: Goal Seek, Solver and Scenarios. A *what-if analysis* changes variables to see how it impacts a final result. For example, we can change the interest rate or the terms on a car loan to calculate the overall price or payoff date of an automobile.

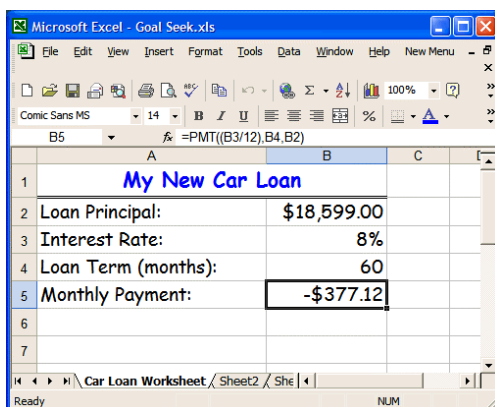
Before we use any of these analysis tools, they must be loaded into Excel. Click **Tools => Add-Ins...**, select the appropriate add-in components in the **Add-Ins** dialog box and click **OK**. For our purposes, you will need to load the **Analysis ToolPak** and the **Solver Add-in**.



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Now, getting back to Goal Seek, consider the following example:



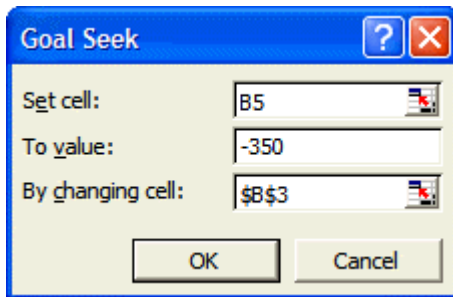
The PMT function in cell B5 shows a monthly payment of \$372.69 for a loan amount of \$18,599.00 with an interest rate of 8% over a loan term of 60 months. (By the way, you can learn about the PMT function by reading my [Excel 2002 core study guide](#) here at Cramsession.). What if we could only afford to pay \$300 per month? How would this affect our loan term? How about if we adjusted the interest rate by switching to another bank? Well, let's run a Goal Seek analysis on the data.

Select a cell within your data table and click **Tools => Goal Seek...** In the **Goal Seek** dialog box, click within the **Set cell:** box and then select the appropriate cell in the Excel worksheet. In this example it will be cell B5, which contains the monthly

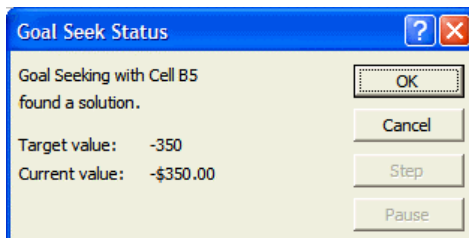


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payment formula. Next, click within the **To value:** box and enter the changed value. In this example we'll use -350. You **MUST** use the minus sign to denote a negative value because payments that are computed by using the PMT function display as negative numbers. If you don't make the **To value:** value negative, then Goal Seek will fail. Finally, click in the **By changing cell:** box and select the cell that will be made variable during the operation. In this example it is cell B3, because this cell contains the interest rate. Click **OK** to begin the Goal Seek process.



Excel will display the **Goal Seek Status** dialog box when it finds a solution. Press **OK** to accept the change to your data; press **Cancel** to undo the change.



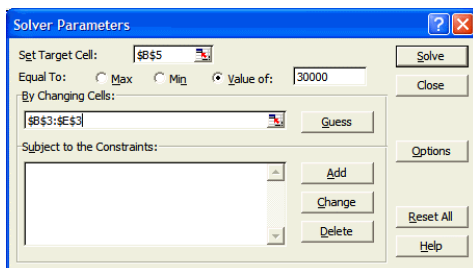
You can use Solver to perform what-if analysis using multiple input values. Let's take an example. Take a look at the following data table:

Matchless Candles Budget Forecast					
	Addams	Carr	Riley	Watterson	Totals
Budget	\$66,286	\$30,336	\$67,108	\$57,823	\$221,553
Proj. Sales	\$87,500	\$45,000	\$110,000	\$75,000	\$317,500
Net Gain	\$21,214	\$14,664	\$42,892	\$17,177	\$95,947

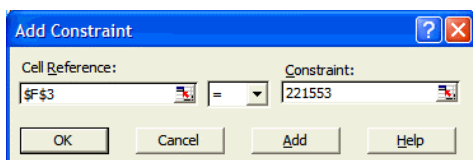


Microsoft MOUS Excel 2002 Expert

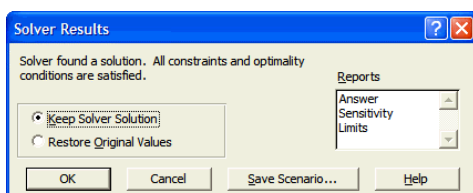
Suppose we want to see a net gain for the salesperson named Addams of \$30,000. We can have Solver determine the new budget value for all four salespeople by changing their individual budget values, given the company's budget cap of \$221,553. To start Solver, click **Tools => Solver....** In the **Solver Parameters** dialog box, use the **Collapse Dialog** button in the **Set Target Cell:** dialog box to shrink the window and allow you to select the cell that will be reset to a new value. In this example, that is cell B5, which contains Addams' **Net Gain** value. Because we want this cell to equal \$30,000, we must select **Value of:** in the **Equal To:** option group and type **30000** into the box. We next want to define the range of cells that will change in order for Solver to find us a solution; type or select the appropriate range in the **By Changing Cells:** text box.



Finally, we must define the maximum value that Excel can use as it changes the values in the cell range B3:E3 in finding a solution to this scenario. To do this we must add a *constraint*. Click **Add** in the **Subject to the Constraints:** portion of the **Solver Parameters** dialog box. In the **Add Constraint** dialog box, mark the cell reference, select **=** as your operator and type **221553** into the **Constraint** box. Then click **OK**.



Click **Solve** in the **Solver Parameters** dialog box in order to let Solver find a solution. When it does, you will see the following dialog box:

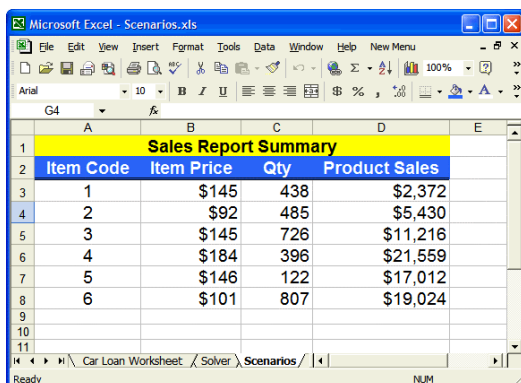




Select the appropriate choice and click **OK** to finish the procedure.

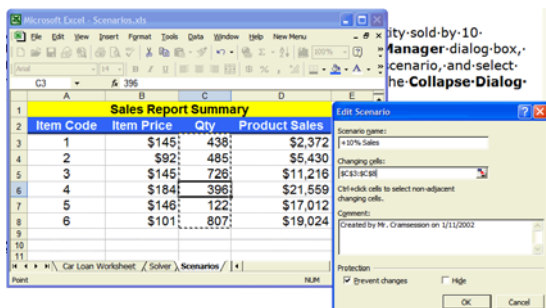
Create and display scenarios

Scenarios allow you to ask "what-if" questions of your Excel data, and save the results for reuse. Before we begin, consider the following sample data:

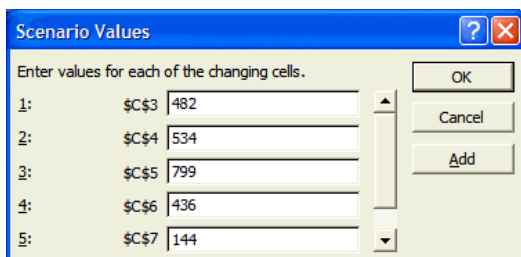


Item Code	Item Price	Qty	Product Sales
1	\$145	438	\$2,372
2	\$92	485	\$5,430
3	\$145	726	\$11,216
4	\$184	396	\$21,559
5	\$146	122	\$17,012
6	\$101	807	\$19,024

In this example, we will ask the question "What if we increased our quantity sold by 10 percent?" To get started, click **Tools => Scenarios....** In the **Scenario Manager** dialog box, click **Add....** In the **Edit Scenario** dialog box, enter a name for the new scenario, and select the cell range that will be modified under **Changing cells:**. You can use the **Collapse Dialog** button to get the dialog box out of the way if you need to. In the following screen capture, you will notice that the range C3:C8 has been defined in the **Edit Scenario** dialog box.



The next step is kind of a pain. Unfortunately, you will need to manually enter the changed values for each cell in the range. In this example, I had to compute 10% over each value for **Qty**, and hand-type each modified value in the appropriate slot. Click **OK** when you are ready to proceed.



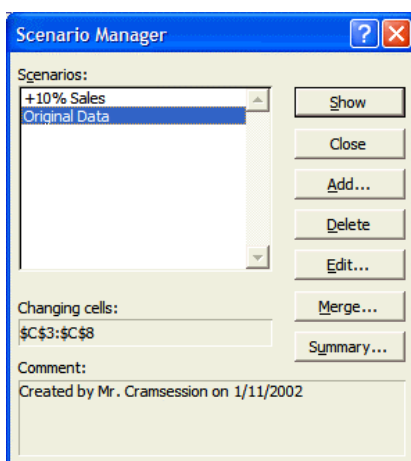
Scenario Values

Enter values for each of the changing cells.

1:	\$C\$3	482
2:	\$C\$4	534
3:	\$C\$5	799
4:	\$C\$6	436
5:	\$C\$7	144

Buttons: OK, Cancel, Add

At this point, you have a fully saved scenario. Click **Show** in the **Scenario** Manager dialog box to display the scenario results. It seems I always tell you this after the fact, but Microsoft advises that you create a scenario with your **original** data before you create any additional scenarios. The reason for this is because the scenario *permanently* changes your data (you can always undo, of course, but that isn't going to help you if you close out of Excel and open the file again at a later time.) So ALWAYS create a scenario called "Original Data" or some such thing with your original data.



Scenario Manager

Scenarios:

- +10% Sales
- Original Data

Buttons: Show, Close, Add..., Delete, Edit..., Merge..., Summary...

Changing cells:
\$C\$3:\$C\$8

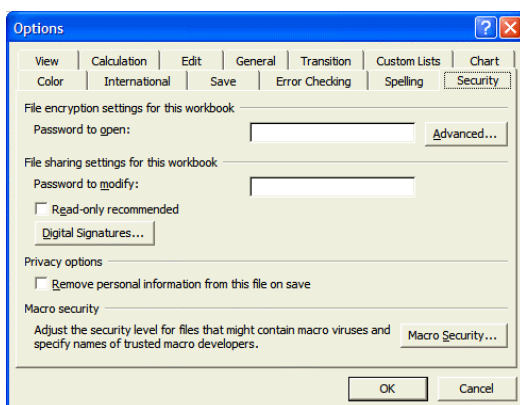
Comment:
Created by Mr. Cramsession on 1/11/2002



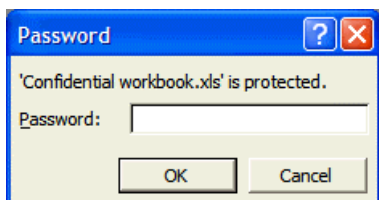
Workgroup Collaboration

Modify passwords, protections, and properties

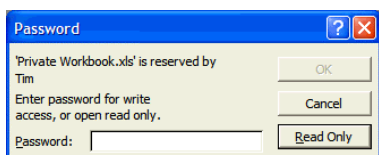
To password-protect an Excel 2002 workbook, click **Tools => Options**, navigate to the **Security** tab, and examine the **File encryption settings for this workbook** options.



In particular, the **Password to open:** setting completely locks a workbook. The following screen capture displays the dialog that appears when you try to open a workbook for which a **Password to open** password has been applied.



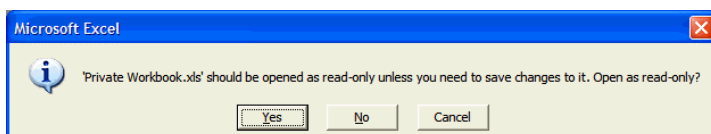
On the other hand, the **Password to modify:** will allow a workbook to be opened read-only at the least, and with full access if you have the proper password. The following screen capture displays the dialog box that appears for a workbook for which a **Password to modify** password has been applied.





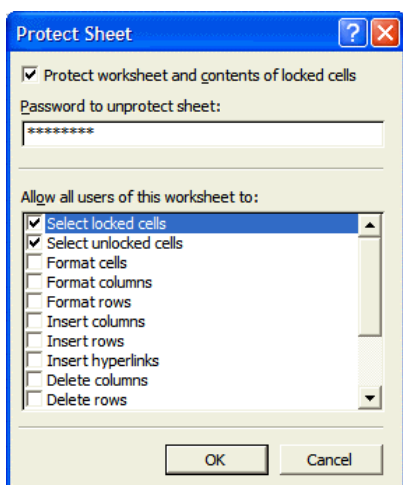
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The following screen capture shows the dialog box that appears if you select the **Read-only recommended** option in the **Options** dialog box. This dialog box will only appear if the person opening the workbook has supplied the correct password to unlock the document.

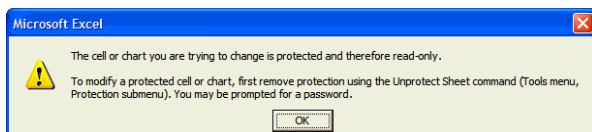


You can also apply *protections* to an Excel worksheet or workbook. Protections differ from completely locking a document; protections limit what a user can do on a particular worksheet or workbook.

To apply protection to a worksheet, click **Tools => Protection => Protect Sheet....** In the **Protect Sheet** dialog box, supply an optional password and decide what actions you want to allow on the sheet by making the appropriate selections from the **Allow all users of this worksheet to:** list box.

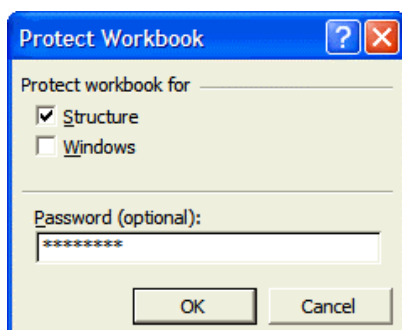


If a user attempts an action that has been prevented through worksheet protection, they will see the following dialog box.



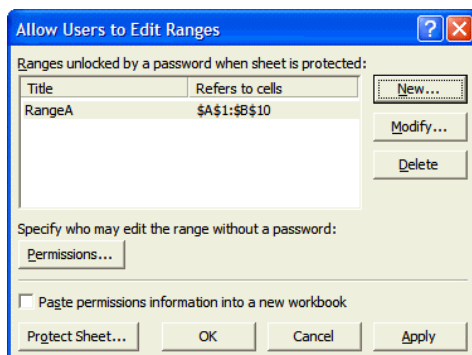


To protect an entire workbook, click **Tools => Protection => Protect Workbook....** In the **Protect Workbook** dialog box, decide whether you want to protect only workbook structure (prevents worksheets from being added, moved, renamed, or deleted), and/or workbook window positions. Again, you can supply an optional password.

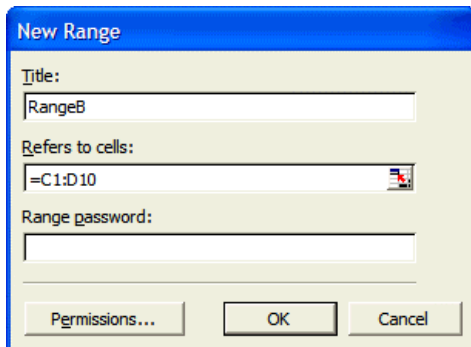



To unprotect a protected worksheet or workbook, click **Tools => Protection => Unprotect Sheet...**, or **Unprotect Workbook...**, respectively, and supply the correct password.

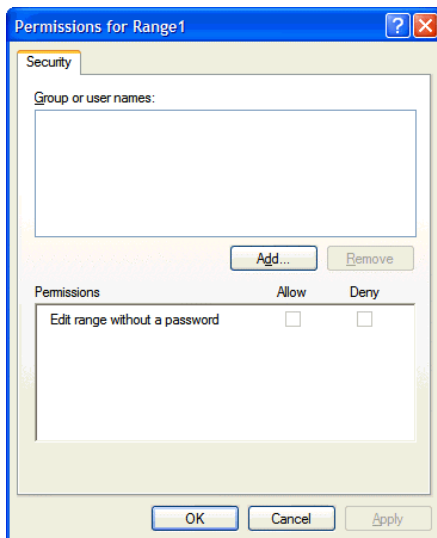
A cool new feature of Excel 2002 is the ability to password-protect specific ranges of a worksheet. To do this, select the first range and click **Tools => Protection => Allow Users to Edit Ranges....**



In the **Allow Users to Edit Ranges** dialog box, click **New...** to specify a range.



In the **New Range** dialog box, name the protected range and enter the appropriate cell range in the **Refers to cells:** dialog box. You can use the **Collapse Dialog** button  to scoot the **New Range** dialog box out of the way and assist you in locating the appropriate cell range. Finally, supply an optional password. Clicking **Permissions...** will allow you to specify discrete user accounts who will be allowed to edit the range without being prompted for a password. These accounts are either network accounts or accounts that reside on the local computer (if the local computer is running Windows NT, Windows 2000 or Windows XP). We won't get into this subject any deeper, for it goes well beyond the depth necessary for the Excel 2002 Expert MOUS exam.

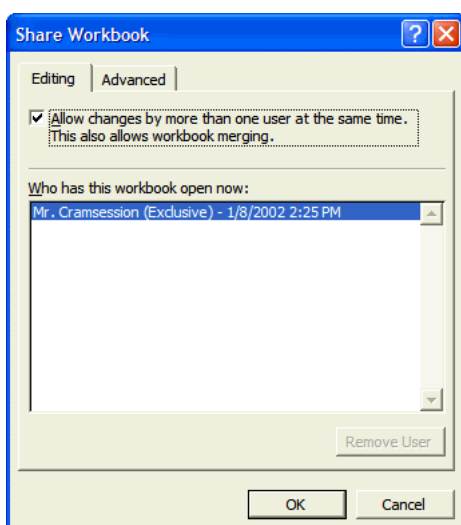




Create a shared workbook

A *shared workbook* is an Excel 2002 workbook that is available for multi-user access. Sharing a workbook from within Excel does not make the file available to users across a network- this must be accomplished by using the operating system. However, file sharing in Excel does allow more than one user to open a workbook simultaneously to make changes to it.

To share a workbook, click **Tools => Sharing....** In the **Share Workbook** dialog box, enable **Allow changes by more than one user at the same time. This also allows workbook merging.**

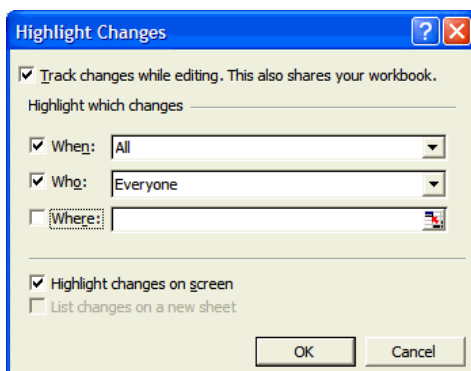


The **Who has this workbook open now:** list box will display every user who currently has the file open. To disconnect a user (and have the user lose all of his or her unsaved work), click **Remove User**. Navigate to the **Advanced** tab of the **Share Workbook** dialog box in order to customize how the file is shared among multiple users.



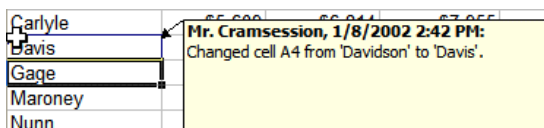
Track, accept and reject changes to workbooks

Revision tracking is always a fun subject. To enable revision tracking for an Excel 2002 workbook, click **Tools => Track Changes => Highlight Changes....**



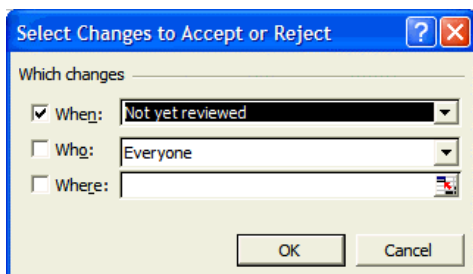
In the **Highlight Changes** dialog box, enable **Track changes while editing. This also shares your workbook.** Beneath **Highlight which changes**, determine when you'd like your changes tracked (options include **All**, **Since I last saved**, **Not yet reviewed** and **Since date**), who you want to track (options include **Everyone** and **Everyone but Me**), and (optionally) which portion of the workbook you want to track changes on -- the default is the entire thing, of course. Finally, the **Highlight changes on screen** clearly shows any edits that are made to the document.

As long as revision tracking is turned on and changes are configured to appear on screen, any cell that contains an edit will contain a small, dark-colored triangle. You can hover your mouse pointer over this triangle to display a ScreenTip that contains a description of the change.

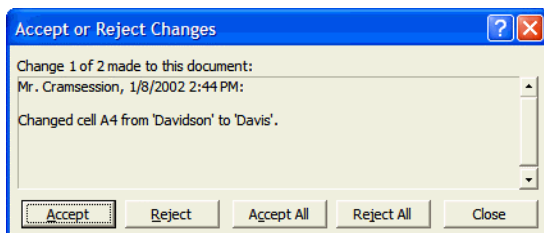


To review changes in a document, click **Tools => Track Changes => Accept or Reject Changes....**

In the **Select Changes to Accept or Reject** dialog box, decide the "who, what, and where" and click **OK** to begin the edit review process.

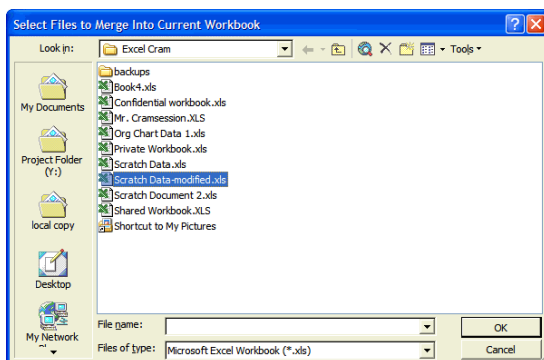


The **Accept or Reject Changes** dialog box will give a full description of the change that was made as well as the user who made the change. Use the buttons at the bottom of this dialog box to determine the fate of each edit. (if you are in a particularly nasty mood, you can just click **Reject All** and be done with it.)



Merge workbooks

To merge changes between two or more Excel workbooks, a few requirements must be met. First of all, the original document must be **shared**, per my instructions a bit earlier in this document. Second, both files must reside in the same location. To perform a document merge, open the original document and click **Tools => Compare and Merge Workbooks....**





Microsoft MOUS Excel 2002 Expert

Browse to the modified file and click **OK**. That's all there is to it! Unless revision tracking was turned on, you won't see any revision marks in the original document after it has been merged with the copy.