Microsoft®

Excel 2013

Lesson 2: Organizing Data

Lesson Objectives

In this lesson, you will look at various methods of organizing data to improve your ability to analyze it. On successful completion of this lesson, you will be able to:

☐ create, modify, and delete range names

☐ use Go To to jump to a cell or named range

☐ convert a range of data to a table

☐ modify a table by adding and deleting rows and columns of data

☐ apply and remove formatting on a table

☐ sort data

☐ use filtering on data

☐ remove duplicate rows of data

☐ outline and group data using automatic subtotals

☐ outline and group data by manually inserting subtotals

Working with Named Ranges

Creating Named Ranges

When developing spreadsheets, you will find that they quickly become very large and it becomes difficult to keep track of all the cells. One feature in most spreadsheet programs is the ability to create a meaningful name for a cell or range of cells. For example, it is much easier to understand the formula =*Total_Revenues–Total_Expenses* than a cryptic formula such as = *C7–C18*. With meaningful names, it becomes easier for users to understand the purpose of these cells.

To define a range with a name, select the range and then use one of the following methods:

• On the Formulas tab, in the Defined Names group, click **Define Name**, or

• click in the **Name Box** and type the name, or

• right-click the selected range and then click **Define Name**.

Once you define a name for a cell or a range of cells, you can use that name when creating formulas. Excel also provides tools to convert formulas by replacing the cell references with their new range names.

You can also quickly jump to a named range by using **Go To** or by selecting the named range from the **Name Box** list to the left of the Formula bar.

In addition to making spreadsheets easier to read by using meaningful names, range names can reduce the number of errors made. For example, the formula =*C7–C18* can easily be entered incorrectly. However, if you incorrectly enter any range name in a formula such as =*Total_Revenues–Total_Expenses*, Excel will not be able to match that range name to any cell and will display an error message.

Range names also reduce errors if you change the cells included in the range. For example, suppose you change the cell range for the range name *Expenses* from C10:C18 to C10:C19. By changing the cell range once, then every formula in the workbook that uses the Expenses range name will be automatically updated. If you did not use a range name, then you must ensure that the cell range C10:C18 is changed wherever it is used in the workbook. You will likely miss one or more of them.

Range names can be from 1 to 255 characters in length. They may contain alphabetic or numeric characters (alphanumeric), underscores (_), backslashes (\), periods (.) and question marks (?). You cannot use spaces in range names. The first character must be alphanumeric, an underscore, or a backslash.

Learn the Skill

This exercise demonstrates how to create range names and set up formulas using those range names.

1   Open the *Income Statement* workbook and save as `Income Statement - Student`.

Now create a range name to use in sales calculations.

2   Select cells **C5**:**C6**.

3   On the Formulas tab, in the Defined Names group, click **Define Name**.

The New Name dialog box displays with the cell range entered.

4   In the **Name** field, type: `Revenues` and click **OK**.

From now on, whenever you select these two cells, the range name **Revenues** displays in the Name Box, which appears to the left of the Formula Bar.

Revenues	▼	:	✕	✓	*fx*	77500

◢	A	B	C
1		Tolano Adventures	
2		Income Statement	
3			
4	Revenues:		
5		Sales	77,500.00
6		Other Revenues	555.00
7		Total Revenues	

5   Select each of the cells in the cell range **C5**:**C6** and observe what displays in the Name Box.

6   Select the cell range **C5**:**C6** and observe what displays in the Name Box.

This demonstrates that the range name only appears when the entire range is selected.

7   Select cells **C10:C17**. On the Formulas tab, in the Defined Names group, click **Define Name**.

8   In the **Name** field, type: `Expenses` and click **OK**.

You can also create a range name by selecting the desired cell(s) and clicking in the **Name Box** on the Formula bar. You can then type the desired name and press `Enter`.

Now enter summary formulas using this range name.

9 Select cell **C7**.

10 Type: =SUM(Revenues) and press ⌈Enter⌋.

Notice that as you type the first one or two characters of the range name, a quick tip box appears, showing you this name and other functions with similar names. You can double-click the range name in the quick tip box to select it and continue with entering the rest of the formula.
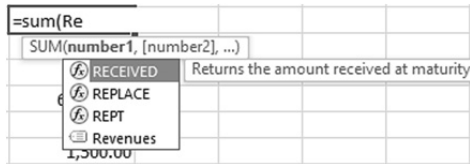
11 Select cell **C18**, type: =SUM(ex to enter the first part of the formula.

12 Double-click on the **Expenses** name in the quick tip box to select it, continue with typing:) and press ⌈Enter⌋.

As another reminder, Excel permits you to omit entering the last parenthesis for this function. However, Excel does not permit this for every function, and it is poor practice.

13 Select cells **B7:C7**.

14 On the Formulas tab, in the Defined Names group, click **Create from Selection**.
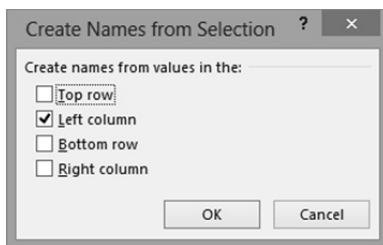
15 Verify that the **Left column** check box is the only one turned on and click **OK**.

16 Select cell **C7**.

Note that the range name in the Name Box is **Total_Revenues**.

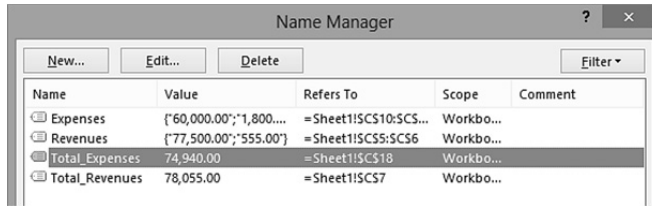Create a range name for the *Total Expenses* cell, but this time, using the Name Manager.

17 Select cell **C18**.

18 On the Formulas tab, in the Defined Names group, click **Name Manager**.

The Name Manager dialog box is now displayed.

19 In the Name Manager dialog box, click **New** to create a new range name.

20 Verify that the **Name** is Total_Expenses and that the Refers to field contains the formula =Sheet1!$C$18, then click **OK**.

If the New Name dialog box is blocking access to the worksheet behind it, you can minimize it temporarily by clicking the **Collapse** button to the right of the Refers to field. You can then select a range of cells from the worksheet.

The Name Manager dialog box now has this new range name added, similar to the following example:

Name	Value	Refers To	Scope	Comment
Expenses	{"60,000.00";"1,800....	=Sheet1!$C$10:C...	Workbo...	
Revenues	{"77,500.00";"555.00"}	=Sheet1!$C$5:$C$6	Workbo...	
Total_Expenses	74,940.00	=Sheet1!$C$18	Workbo...	
Total_Revenues	78,055.00	=Sheet1!$C$7	Workbo...	

21 Click **Close** to close the Name Manager dialog box.

Enter the formula to calculate the Net Income, using the range names.

22 Select cell **C20**, and type: =

23 On the Formulas tab, in the Defined Names group, click **Use in Formula**.

Use in Formula ▾
- Expenses
- Revenues
- Total_Expenses
- Total_Revenues
- Paste Names...
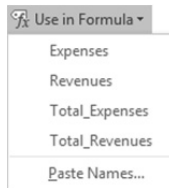
24 Click **Total_Revenues**, then press ⊖ to indicate that you are going to perform a subtraction.

25 On the Formulas tab, in the Defined Names group, click **Use in Formula**. Click **Total_Expenses** and press ⏎ Enter.

	A	B	C
1		Tolano Adventures	
2		Income Statement	
3			
4	Revenues:		
5		Sales	77,500.00
6		Other Revenues	555.00
7		Total Revenues	78,055.00
8			
9	Expenses:		
10		Rent	60,000.00
11		Telephone	1,800.00
12		Internet	1,500.00
13		Photocopier	960.00
14		Supplies	3,000.00
15		Courier	780.00
16		Advertising	3,000.00
17		Utilities	3,900.00
18		Total Expenses	74,940.00
19			
20	Net Income		3,115.00

26 Save the workbook.

Modifying and Deleting Named Ranges

You can use the Name Manager to modify and delete range names or change the cell range references.

Be cautious when deleting named ranges. When you delete a named range, any formula that refers to this name no longer displays the correct value. Deleting a range name may also cause a domino effect with other formulas that indirectly refer to this formula.

Learn the Skill

This exercise demonstrates how to the Name Manager to update and delete range names.

1 Ensure the *Income Statement – Student* workbook is open.

A common situation is adding more rows to a named range. As long as you add the rows inside the range, Excel automatically includes the new data as part of the range. If you add the new data outside of the range, you will need to expand the range to include the new row(s).

3   Click the gray header for row 18 to highlight the entire row. Right-click in the highlighted row and click **Insert** in the menu.

4   Select cell **B18**, type: Travel and press Tab.

5   In cell **C18** type: 1400 and press Enter.

Note that none of the figures in the report changed because the new entry sits outside of the named range Expenses. Now expand the named range to include the new entry.

When you first created the range name, you could have included additional blank cells for future growth. Then, as you add new entries to the list, Excel automatically recalculates the total expenses formula.

6   On the Formulas tab, in the Defined Names group, click **Name Manager**.

7   In the Name Manager dialog box, click the *Expenses* row to select it.

8   In the Refers to text field, change the range to =Sheet1!$C$10:$C$18 as the range.

9   Click **Update** (the checkmark) to the left of the field to update the changes, and click **Close**.

The worksheet should now show the correct calculations for each of the functions:

	A	B	C
1		Tolano Adventures	
2		Income Statement	
3			
4	Revenues:		
5		Sales	77,500.00
6		Other Revenues	555.00
7		Total Revenues	78,055.00
8			
9	Expenses:		
10		Rent	60,000.00
11		Telephone	1,800.00
12		Internet	1,500.00
13		Photocopier	960.00
14		Supplies	3,000.00
15		Courier	780.00
16		Advertising	3,000.00
17		Utilities	3,900.00
18		Travel	1,400.00
19		Total Expenses	76,340.00
20			
21	Net Income		1,715.00

Try deleting a named range and see how it affects the worksheet.

10   On the Formulas tab, in the Defined Names group, click **Name Manager**.

11   Click the *Revenues* row and then click **Delete**.

Excel displays a message box asking you to confirm the deletion of this range name.

12   Click **OK** for the confirmation message box and then click **Close** to close the Name Manager dialog box.

As shown in the following example, when you remove a named range, Excel displays an error indicator regarding any formulas that depend on that name. Note also that the change has affected the formula in cell **C21** as well, even though it does not use the range name Revenues directly.

	A	B	C
1		Tolano Adventures	
2		Income Statement	
3			
4	Revenues:		
5		Sales	77,500.00
6		Other Revenues	555.00
7		Total Revenues	#NAME?
8			
9	Expenses:		
10		Rent	60,000.00
11		Telephone	1,800.00
12		Internet	1,500.00
13		Photocopier	960.00
14		Supplies	3,000.00
15		Courier	780.00
16		Advertising	3,000.00
17		Utilities	3,900.00
18		Travel	1,400.00
19		Total Expenses	76,340.00
20			
21	Net Income		#NAME?

13 In the Quick Access Toolbar, click **Undo**.

**14** Save the workbook.

Go To a Cell or Named Range

Moving from cell to cell in a worksheet is a very simple because the process is the same as with other Windows programs. You can select a cell that appears on the screen simply by clicking on it. If you need to scroll to sections of the worksheet that are currently off the screen, you can use the scroll buttons.

With Excel, you can use a quicker method of jumping to a specific cell (as long as you know exactly what the cell address is) by using the Go To feature. With very large worksheets, the Go To feature helps you to navigate around them more easily.

To display the Go To dialog box, use one of the following methods:

- Press [F5], or
- Press [Ctrl]+[G].

Alternatively, you can also use the Name Box located to the left of the Formula Bar to select a named range of cells or to jump to a specific worksheet cell.
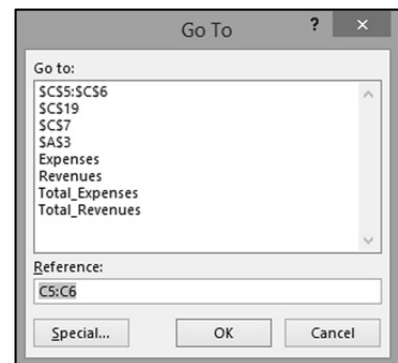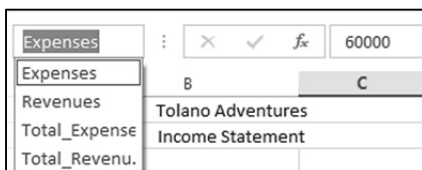
Learn the Skill

This exercise demonstrates how to jump to a cell or named range using the Go To dialog box and the Name Box.

1 Ensure the *Income Statement – Student* workbook is open.

2 Click on cell **A3** to jump to that cell using the mouse.

Now select a cell range using the Go To dialog box.

3 Press [F5].

4 In the Go To dialog box, click **Expenses** and click **OK**.

Use the Name Box to jump to another named range.

5   Click the drop-down button in the **Name Box**, and click **Revenues**.

Expenses	:	×	✓	*fx*	60000
Expenses			B		C
Revenues		Tolano Adventures			
Total_Expense		Income Statement			
Total_Revenu.					

The cell range C5 to C6 is now selected. Use the Go To dialog box to jump to another cell in the worksheet.

6   Press (Ctrl)+(G), type: H14 in the Reference text box (be sure that the H14 is the only address in that text box) and click **OK**.

Use the Name Box to jump to a different cell.

7   Click in the **Name Box**, type: F3 and press (Enter).

8   Save and close the workbook.

Using Tables

Creating a Table

Many worksheets consist of a rectangular block of data in which the rows of data have a common structure and format. Excel offers you the ability to define this block as a table. As a table, you can use a variety of tools such as selecting summary formulas, formatting, sorting, and filtering. These same features are available even without using tables but you had to insert these features manually by selecting the range of cells that apply. However, by defining a range of cells as a table, you indicate to Excel that this group belongs together as a single unit. These same tools are then easier to apply because Excel now knows which cells to include.

A table is not the same as a named range of data but you can define a range name for a table if you wish.

To create a table, the data must be contiguous. That is, there must not be any blank rows or columns in the range of cells. Also, the data must be arranged in row order, with a header at the top of each column and the data listed below.

To convert a range of cells containing data to a table, use one of the following methods:

- On the Insert tab, in the Tables group, click **Table**, or

- on the Home tab, in the Styles group, click **Format as Table**, then click a table style, or

- after selecting the cell range, click the **Quick Analysis** icon, then click the **Tables** category and click **Table**, or

- press (Ctrl)+(T).
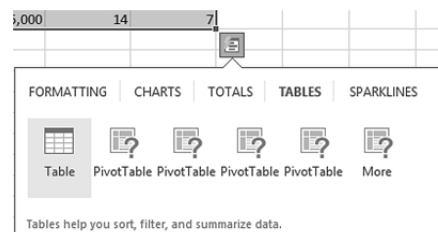
Once you create the table, Excel activates an AutoFilter icon next to each column title and applies the current active theme. The Table Tools Design tab is also added to the Ribbon:
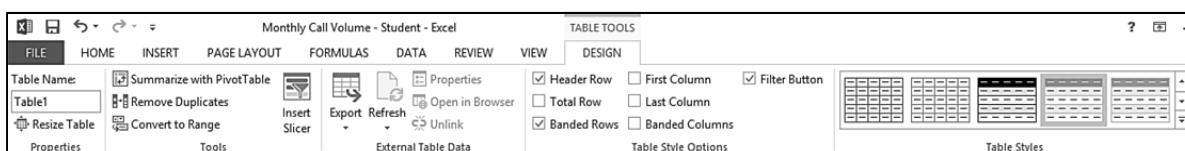
One of the table features is the ability to insert an automatic Total Row at the bottom of the table.

Learn the Skill

This exercise demonstrates how to create a table, assign a name of your choice to the table, and add a total row at the bottom.

1   Open the *Monthly Call Volume* workbook and save as Monthly Call Volume – Student.
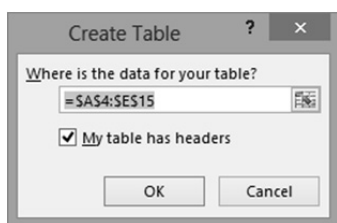
For the purpose of this exercise, we will delete the bottom row and add it back in later.

2   Click the row **16** header and then, on the Home tab, in the Cells group, click **Delete**.

Now convert the data to a table.

Hint: When creating a table, leave at least one empty row and column on all sides of the table to separate it from any other data on the worksheet.

3   Click on any cell in the range **A4**:**E15**.

4   On the Insert tab, in the Tables group, click **Table**.

Create Table	?	×
Where is the data for your table?		
=$A$4:$E$15		
☑ My table has headers		
OK	Cancel	

5   Confirm that **My table has headers** is turned on and then click **OK**.

The data is now converted into a table. Change the table name to something that is more meaningful to you.

6   Under Table Tools, on the Design tab, in the Properties group, click in the **Table Name** field and replace the default name to: CallVolume (with no spaces between the words).

Turn on the automatic Total row.

Note: When you activate the Total row, Excel automatically moves any data below the table down by one row.

7   Under Table Tools, on the Design tab, in the Table Style Options group, click **Total Row** to turn it on.

Enter some common statistical formulas using the data in the table.

8   Select cell **B16**, click the drop-down arrow that appears next to it, and click **Average**.

9   Repeat step 8 for the **Count**, **Max**, and **Min** options for cell B16.

10   Repeat step 9 for the **Sum** option for cell B16.

11   Select each of the cells **C16:D16** and select the **Sum** calculation.

Note: You cannot copy the contents of a column total to other cells in a table.

If you also want to display row totals (in a new column to the right of the table), you will have to insert them manually. Tables do not have the ability to create row totals automatically. Row totals show the sum total for each row of data.

12   Click on cell **F4** and enter: Total.

Insert the SUM formula for the first row.

13   With cell **F5** as the active cell, on the Home tab, in the Editing group, click **AutoSum** and press ⏎ Enter .

Even though you only entered the row total for the first row, Excel has automatically inserted them for the rest of the rows, except the Total row. This demonstrates one of the advantages of identifying this range of cells as a table.

14 Click on cell **F5**.

You can see that the formula used for this sum total is specifically used for tables.

			fₓ	=SUM(CallVolume[@[Sales Inquiries]:[Complaints]])	
B	C	D	E	F	
Inquirie ▾	Service Inquirie ▾	General Inquirie ▾	Complaint ▾	Total ▾	
8,947	4,799	68	26	13,840	

Now insert the Total Row calculation for this new column.

15 Select cell **F16**, click its drop-down arrow, and select **Sum**.

| ◢	A	B	C	D	E	F
1			**Tolano Adventures**			
2			Monthly Call Volume			
3						
4	Montl ▾	Sales Inquirie ▾	Service Inquirie ▾	General Inquirie ▾	Complaint ▾	Total ▾
5	Jan-13	8,947	4,799	68	26	13,840
6	Feb-13	3,643	5,658	36	14	9,351
7	Mar-13	5,861	9,739	0	7	15,607
8	Apr-13	3,741	4,429	18	25	8,213
9	May-13	4,537	5,420	59	19	10,035
10	Jun-13	3,146	1,417	77	12	4,652
11	Jul-13	2,533	7,811	19	6	10,369
12	Aug-13	7,209	2,188	71	15	9,483
13	Sep-13	1,082	8,718	56	24	9,880
14	Oct-13	2,748	8,002	72	14	10,836
15	Nov-13	5,617	5,000	14	7	10,638
16	Total	49,064	63,181	490	169	112,904

16 Save the workbook.

Modifying Table Data

After the table is created, you can add or delete rows and columns of data.

To add a new column of data at the far right of a table, simply enter this data into the first blank column. Excel will automatically extend the table to include this new column. Similarly, Excel will extend the table to include a new row of data that you enter directly below a table, as long as the Total Row feature is not activated. If the Total Row is activated, you must use one of the following methods:

- Manually insert a new blank data row by clicking on the bottom right cell containing data (immediately above the Total Row), and then clicking the (Tab) key.

- Manually insert a new blank data row by clicking any cell in the bottom data row, then on the Home tab, in the Cells group, click the arrow next to **Insert**, and click **Insert Table Row Below**.

- Add the new row of data below the Total Row, and then manually extend the table to include the new row.

The Insert button in the Home tab can be used to insert a new row or column anywhere in the table, not just as the last row of data. Be aware that the Insert drop-down menu may show different Insert Table options, including various combinations of Insert Table Rows Above, Rows Below, Columns to the Left and Columns to the Right, depending on which cell in the table is currently selected as the active cell.
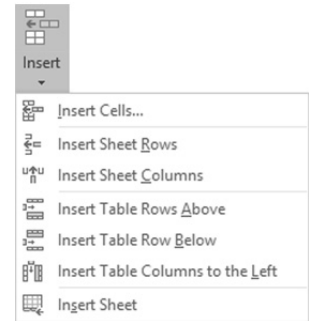
Similarly, on the Home tab, in the Cells group, you can use the **Delete** button to delete rows or columns of data from the table.

If you no longer wish to keep the data in a table, you can convert it back to a regular set of rows and columns of data without the table definition. Under Table Tools, on the Design tab, in the Tools group, using the **Convert to Range** tool to convert the data.
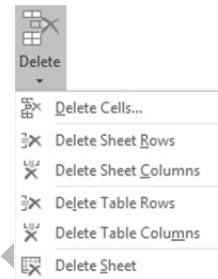
Learn the Skill

This exercise demonstrates how to insert rows and columns of data into different parts of a table, and convert the table back to a range of cells.

1   Make sure the *Monthly Call Volume - Student* workbook is selected.

Now add a new row at the bottom of the table.

2   Select cell **F15** and press Tab.

Notice that Excel automatically shifts the Total row down by one row and that the formula in cell **F15** is copied down to this new row.

3   In cell **A16**, type: December 2013 as the new value and press Tab.

4   Enter the following values into the remaining cells of the row:

      B16   8969
      C16   7375
      D16   7
      E16   1

Notice also that the statistical formulas in row 17 (these were all Sum but you may have selected Average or other formulas instead) automatically updated even though the new data were added at the bottom of the list.

Now add a new column between the Complaints and Total columns.

5   Select cell **F8**, then on the Home tab, in the Cells group, click the arrow next to **Insert**, and click **Insert Table Columns to the Left**.

6   Click cell **F4** and type: Other.

7 Enter the following values into the remaining cells of the column:

F5	500	F11	200
F6	300	F12	480
F7	250	F13	100
F8	450	F14	200
F9	400	F15	150
F10	220	F16	300

8 Select cell **E17**, click the drop-down arrow that appears next to it, and click **Sum**.

By adding a column to the table, you must ensure that the Total column at the far right includes this new column.

9 Click on cell **F5**, and note the formula in the Formula Bar.

10 Press F2, delete the table cell reference [Complaints], and replace it with: [Other].

If no longer needed, a column (or row) can be easily removed from a table.

11 Click on any cell in the range D4 to D17, then on the Home tab, in the Cells group, click the arrow next to **Delete**, and click **Delete Table Columns**.

▲	A	B	C	D	E	F
1			**Tolano Adventures**			
2			Monthly Call Volume			
3						
4	Montl ▾	Sales Inquirie ▾	Service Inquirie ▾	Complaints ▾	Other ▾	Total ▾
5	Jan-13	8,947	4,799	26	500	14,272
6	Feb-13	3,643	5,658	14	300	9,615
7	Mar-13	5,861	9,739	7	250	15,857
8	Apr-13	3,741	4,429	25	450	8,645
9	May-13	4,537	5,420	19	400	10,376
10	Jun-13	3,146	1,417	12	220	4,795
11	Jul-13	2,533	7,811	6	200	10,550
12	Aug-13	7,209	2,188	15	480	9,892
13	Sep-13	1,082	8,718	24	100	9,924
14	Oct-13	2,748	8,002	14	200	10,964
15	Nov-13	5,617	5,000	7	150	10,774
16	Dec-13	8,969	7,375	1	300	16,645
17	Total	58,033	70,556	170	3,550	132,309

Add another row of data to the table using a different method.

12 Enter the following values:

A18	January 2014
B18	7000
C18	4000
D18	20
E18	200

13 Ensure that cell F17 is **not** the active cell, then position the cursor at the bottom right corner of cell **F17** so that the cursor changes to a double-headed arrow ↘.

14 Click and drag the resize handle down to row 18.

Hint: If the Total Row is not activated for this table, the new row would have been automatically added to the table.

Because you had added the new data below the Total Row, Excel did not know if you intended to keep that data separate from the table. Therefore, you had to manually expand the table to include the January row.

Convert the table back to a regular range of cells.

15 Ensure that the active cell is anywhere within the table, then under Table Tools, on the Design tab, in the Tools group, click **Convert to Range**.
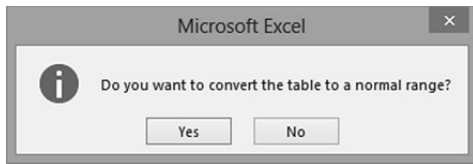
16 Click **Yes**.

The worksheet does not appear any different, except that the Table Tools Design tab no longer appears and the column titles no longer display the filter buttons.

17 Click the drop-down button on the right side of the Name Box to display the list of any range names in the worksheet.

This indicates that the Convert to Range tool simply converts the data to a set of rows and columns with data. If you want to create range names, you must add them manually.

18 Click on any cell in the worksheet to close the Name Box list.

Revert the data back to a table.

19 In the Quick Access Toolbar, click **Undo**.

20 Save the workbook.

Formatting Table Data

By default, the theme selected for the workbook is applied to all tables in that workbook. You can override it for specific tables by selecting a different table style under Table Tools, on the Design tab, in the Table Styles group:

The table style colors option can also be removed, and re-applied later if needed again. If none of these predefined table styles are suitable, you can also create a customized one.

The Table Tools Design tab also allows you to activate or de-activate other table formatting options including:

- Highlighting the first or last column – or both – with the bold font option. By default, both options are turned off.

- "Banding" rows by using different color shades for alternating rows. This feature often improves the readability of tables that are very wide because data in the same row have the same color shade. By default, the Banded Rows option is turned on, but Banded Columns is turned off.
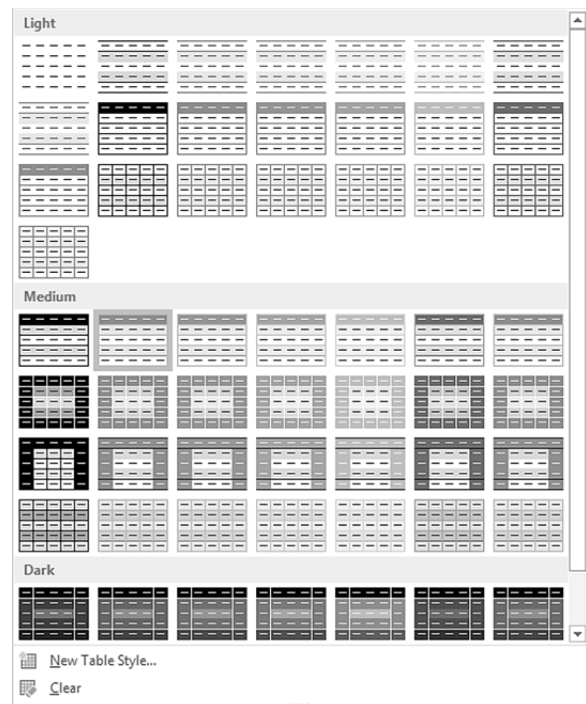
Learn the Skill

This exercise demonstrates how to change and remove the table style, and use different table band formatting options.

1   Make sure the *Monthly Call Volume - Student* workbook is selected.

Preview some of the different table styles that are available.

2   Click any cell in the table.

3   Under Table Tools, on the Design tab, in the Table Styles group, click the **More** button to display all of the table styles.

4   Point the cursor to different table styles and observe the live preview effect on the table.

5   Click on any cell in the worksheet to close the table styles menu and keep the current table style unchanged.

Highlight the left-most and right-most columns so that they stand out.

6   Under Table Tools, on the Design tab, in the Table Style Options group, click the **First Column** and **Last Column** check boxes to turn them on.

Activate the Banded Columns option to see how it affects the table.

7   Under Table Tools, on the Design tab, in the Table Style Options group, click the **Banded Columns** check box to turn it on.

8   Under Table Tools, on the Design tab, in the Table Style Options group, click the **Banded Columns** check box to turn it off.

The table styles can also be removed from the table.

9   Under Table Tools, on the Design tab, in the Table Styles group, click the **More** button, then click **Clear**.

	A	B	C	D	E	F
1			**Tolano Adventures**			
2			Monthly Call Volume			
3						
4	Month	Sales Inquiries	Service Inquiries	Complaints	Other	Total
5	Jan-13	8,947	4,799	26	500	14,272
6	Feb-13	3,643	5,658	14	300	9,615
7	Mar-13	5,861	9,739	7	250	15,857
8	Apr-13	3,741	4,429	25	450	8,645
9	May-13	4,537	5,420	19	400	10,376
10	Jun-13	3,146	1,417	12	220	4,795
11	Jul-13	2,533	7,811	6	200	10,550
12	Aug-13	7,209	2,188	15	480	9,892
13	Sep-13	1,082	8,718	24	100	9,924
14	Oct-13	2,748	8,002	14	200	10,964
15	Nov-13	5,617	5,000	7	150	10,774
16	Dec-13	8,969	7,375	1	300	16,645
17	Jan-14	7,000	4,000	20	200	11,220
18	Total	65,033	74,556	190	3,750	143,529

Notice that the bolding in the first and last columns, and the Total row in the table are also removed, even though the check boxes in the Table Style Options group are still activated.

10   In the Quick Access Toolbar, click **Undo**.

11   Save the workbook.

Sorting Data

Worksheets with a large amount of data are often difficult to understand. Excel provides a sorting tool that enables you to change the sequence of the data based on the values in selected columns. After sorting, the data becomes more readable. You can sort and re-sort the data as many times as required, using different columns each time. You can sort the data by columns or rows, but the most common method is sorting by columns (with column headers and the data extending downwards).

Sorting by Single-Level Data

The Ribbon offers the quickest method of sorting your data but you are limited to sorting by one column. The Ribbon has two ready-to-use buttons for this:

- on the Home tab, in the Editing group, click **Sort & Filter** and then click **Sort A to Z** to sort in ascending sequence or **Sort Z to A** to sort in descending sequence, or

- on the Data tab, in the Sort & Filter group, click **Sort A to Z** or **Sort Z to A**.
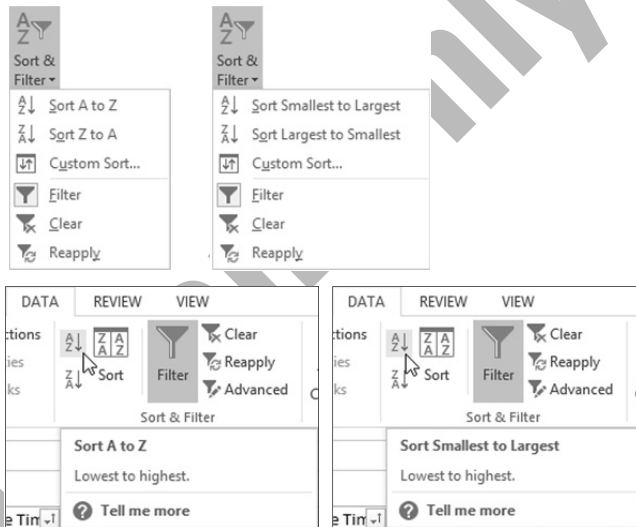
Depending on what type of data you are sorting, the Ribbon menu will display a different command description. If the data is text, the Ribbon menu will display **Sort A to Z** and **Sort Z to A**. If the data contains numbers or times, the Ribbon menu will display **Sort Smallest to Largest** and **Sort Largest to Smallest**. If the data contains dates, the Ribbon menu will display **Sort Oldest to Newest** and **Sort Newest to Oldest**.

Sorting by Multi-Level Data

In many cases, you will need to sort by more than one column to handle situations with multiple rows with the same value. For example, you may have a customer list with several people having the same last name. In this situation, you will want to sort the list using two columns – one containing the customer's last name and the other containing their first name.

The example below shows a range of data sorted using three different columns as sort keys. The primary sort key is airline name in ascending order, as indicated by the green marker: A at the top, down to Z at the bottom. The destination name is the secondary sort key, as designated by the first *Then by* selection: for rows with the same airline. These rows are sorted by destination name as indicated by the red box. The third level sort key in this example is the departure time: for rows where the same airline is flying to the same destination on the same day. These rows are sorted by the departure time as designated in the second *Then by* selection. This group is identified by the blue box.

The settings in the Sort dialog box determine how the data is to be sorted:

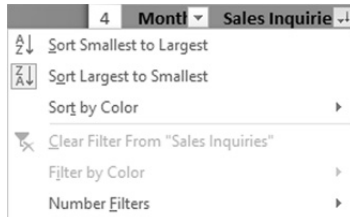|	
Add Level, Delete Level, Copy Level	These buttons allow you to add, delete or copy columns (or rows) in this dialog box to be used as sort keys. Note that the topmost sort key is the highest (primary) sorting level, followed by the remaining levels in descending order.
Move up / Move down	These buttons allow you to change the selected sort level higher or lower in the sorting sequence.
Options	This button displays a dialog box that allows you to sort by columns or rows, and choose whether to treat the data as case-sensitive or not. If you turn the case-sensitive option on, then upper case letters are treated as different characters than lower case characters. For example, the letter "A" is not the same as the letter "a".
My data has headers	This option tells Excel to treat the first row (or column) of cells as labels or titles for the data below (or to the right). Use this option to prevent sorting the header data together with the other data—they will remain in their place as headers. If the range of cells being sorted does not contain column or rows headers, then turn off this setting.
Column/Row	This identifies the column or row to be used for sorting. The sequence of these columns or rows specifies the sorting level. By default, the data is sorted by column with the headers in the top row.
Sort On	The sort options include *Values* (cell data), *Cell Color*, *Font Color*, or *Cell Icon*. These options identify what to use in the cells for sorting. In most cases you will want to sort using the cell values, which is the default.
Order	This option indicates whether to sort the data in ascending (*A to Z*, *Smallest to Largest*, *Oldest to Newest*) or descending (*Z to A*, *Largest to Smallest, Newest to Oldest*) order.
Sort by	This is the primary sort key: the first column or row Excel will use to sort the data.
Then by	These are optional columns or rows for sorting if multiple rows have the same primary sort key. You can select up to 64 columns or rows as sort levels.

Learn the Skill

This exercise demonstrates how to sort a table of data using one column as a sort key. You will then sort the data again using multiple columns.

1 Make sure the *Monthly Call Volume - Student* workbook is selected.

First, sort the data using one of the columns.

2 Click the **AutoFilter** icon for *Sales Inquiries*, then click **Sort Largest to Smallest**.

	4	Montl ▼	Sales Inquirie ⤓
⬆	Sort Smallest to Largest		
⬇	Sort Largest to Smallest		
	Sort by Color	▸	
⧏	Clear Filter From "Sales Inquiries"		
	Filter by Color	▸	
	Number Filters	▸	

Now select a second column for sorting.

3 Click the **AutoFilter** icon for *Complaints* , then click **Sort Smallest to Largest**.

You can see that all of the rows have been re-sorted using only the Complaints column. Both steps 2 and 3 used single-level sorting.

	A	B	C	D	E	F
4	Montl ▼	Sales Inquirie ▼	Service Inquirie ▼	Complaints ⤓	Other ▼	Total ▼
5	Dec-13	8,969	7,375	1	300	16,645
6	Jul-13	2,533	7,811	6	200	10,550
7	Mar-13	5,861	9,739	7	250	15,857
8	Nov-13	5,617	5,000	7	150	10,774
9	Jun-13	3,146	1,417	12	220	4,795
10	Feb-13	3,643	5,658	14	300	9,615
11	Oct-13	2,748	8,002	14	200	10,964
12	Aug-13	7,209	2,188	15	480	9,892
13	May-13	4,537	5,420	19	400	10,376
14	Jan-14	7,000	4,000	20	200	11,220
15	Sep-13	1,082	8,718	24	100	9,924
16	Apr-13	3,741	4,429	25	450	8,645
17	Jan-13	8,947	4,799	26	500	14,272
18	Total	65,033	74,556	190	3,750	143,529

Now sort the data using two different columns at the same time.

4 Ensure that the active cell is anywhere inside the table, then on the **Home** tab, in the **Editing** group, click **Sort & Filter** and then click **Custom Sort**.

Excel displays the Sort dialog box.

Hint: You can also open the Sort dialog box from the Data tab.

5 Click the arrow next to the **Sort by** field and click **Other**.

The Other column is the primary sort key. Use the Sales Inquiries column as the secondary sort key.

6 Click **Add Level** to add another sort key.

7 Click the arrow for **Then by** and then click **Sales Inquiries**.

8 Click the arrow for **Order** and then click **Largest to Smallest**, then click **OK**.

⊿	A	B	C	D	E	F
4	Montl ▼	Sales Inquirie ↓	Service Inquirie ▼	Complaints ▼	Other ↓	Total ▼
5	Sep-13	1,082	8,718	24	100	9,924
6	Nov-13	5,617	5,000	7	150	10,774
7	Jan-14	7,000	4,000	20	200	11,220
8	Oct-13	2,748	8,002	14	200	10,964
9	Jul-13	2,533	7,811	6	200	10,550
10	Jun-13	3,146	1,417	12	220	4,795
11	Mar-13	5,861	9,739	7	250	15,857
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14	May-13	4,537	5,420	19	400	10,376
15	Apr-13	3,741	4,429	25	450	8,645
16	Aug-13	7,209	2,188	15	480	9,892
17	Jan-13	8,947	4,799	26	500	14,272
18	Total	65,033	74,556	190	3,750	143,529

Notice the direction of the arrows in the AutoFilter icon for the Sales Inquiries and Other headers.

To put the data back to its original sequence, you will need to change the sort order.

9   Click the **AutoFilter** icon for *Month*, then click **Sort Oldest to Newest**.

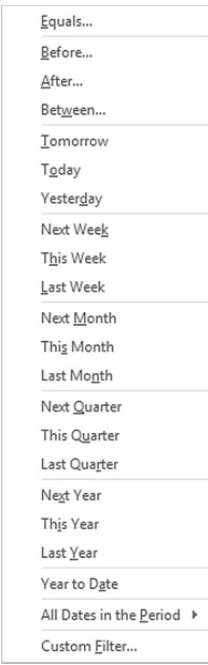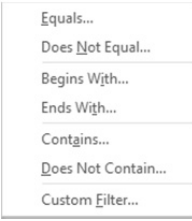**10**   Save the workbook.

Filtering Information

Worksheets are often used to store large amounts of data. Finding information in large worksheets is often difficult because of the sheer volume. Sorting the rows is one way of making it easier to find information. However, you still have to look through many of the rows in the worksheet to find what you are looking for. Another way to locate information quickly is to use a filter to hide the rows you are not interested in viewing. Filtering does not change the content of your worksheet or the sequence of the rows (like the way sorting does), only what you see of your worksheet.

The quickest and easiest way to filter data in Excel is to use the AutoFilter icons on the right side of each of the column titles. If the data is formatted as a table, the AutoFilter icons will be activated by default. If the data is not formatted as a table, you can activate them for any range of data.

In its simplest form, the AutoFilter finds and displays the rows where the value in the selected column meets the criteria that you specify. All other rows are hidden from view until you change the filter criteria or you turn the AutoFilter off.

⊿	A	B	C	D
1	Airline ▼	Flight # ▼	Destination ▼	Departure Tin ▼
49	Lufthansa	8568	Austin, TX (AUS)	8:10 PM
133	Lufthansa	8632	Buffalo, NY (BUF)	4:20 PM
138	Lufthansa	8634	Buffalo, NY (BUF)	6:35 PM
144	Lufthansa	8636	Buffalo, NY (BUF)	10:50 PM
265	Lufthansa	8550	Fort Lauderdale, FL (FLL)	3:13 PM
273	Lufthansa	8552	Fort Lauderdale, FL (FLL)	6:05 PM
283	Lufthansa	401	Frankfurt (FRA)	4:00 PM
291	Lufthansa	405	Frankfurt (FRA)	9:40 PM
607	Lufthansa	411	Munich (MUC)	5:30 PM
618	Lufthansa	8564	New Orleans, LA (MSY)	9:29 PM
700	Lufthansa	8626	Pittsburgh, PA (PIT)	2:55 PM
745	Lufthansa	8620	Raleigh-Durham, NC (RDU)	4:39 PM
753	Lufthansa	8624	Raleigh-Durham, NC (RDU)	9:50 PM
773	Lufthansa	8654	Rochester, NY (ROC)	6:11 PM
779	Lufthansa	8656	Rochester, NY (ROC)	10:45 PM
913	Lufthansa	8574	San Juan (SJU)	3:29 PM
922	Lufthansa	8578	San Juan (SJU)	11:55 PM
993	Lufthansa	8638	Syracuse, NY (SYR)	5:10 PM
999	Lufthansa	8640	Syracuse, NY (SYR)	10:40 PM
1006	Lufthansa	8556	Tampa, FL (TPA)	7:20 PM

The AutoFilter also has the flexibility to help you build more complex queries which you can use to narrow the results and hide rows that you do not want. For example, you can select criteria that examine two or more columns, or that are equal to one of two or more values. In addition, Excel provides powerful selection criteria that are specific to columns containing text, numbers or dates, such as the following:

|		
Numbers	Evaluate numeric data in the selected column using any of the following: • A comparison operator such as equals, greater than, and less than. • The top 10 values. Despite the name displayed in the menu, the filter criteria can also be configured differently to select the top or bottom-most rows. You can also select any number of rows, not just 10. And finally, you can select the number of rows or percentage of rows. For example, 10% of 20 rows will result in only two rows being displayed. • All rows above or below the average of all values in the column. • A custom filter that allows you to select more complex criteria.	Equals... Does Not Equal... Greater Than... Greater Than Or Equal To... Less Than... Less Than Or Equal To... Between... Top 10... Above Average Below Average Custom Filter...
Dates	Evaluate date-type data using a wide variety of criteria that are specific for dates, as shown in the filter menu list:	Equals... Before... After... Between... Tomorrow Today Yesterday Next Week This Week Last Week Next Month This Month Last Month Next Quarter This Quarter Last Quarter Next Year This Year Last Year Year to Date All Dates in the Period ▸ Custom Filter...
Text	Evaluate text data in the selected column using any of the following: • A comparison operator such as equals, greater than, and less than. • Begins or ends with a snippet of text. • Contains or does not contain a snippet of text. • A custom filter that allows you to select more complex criteria.	Equals... Does Not Equal... Begins With... Ends With... Contains... Does Not Contain... Custom Filter...

Learn the Skill

This exercise demonstrates how to use AutoFilters on a table of data.

1 Make sure the *Monthly Call Volume - Student* workbook is selected.

2 Click the **AutoFilter** icon for the Month header.

Activate the AutoFilter and select all rows for specified months.

3 Click the **+** for 2013 to open that tree and see all data rows in the table for this year value.

The AutoFilter menu displays a list of every unique value in this column. You set the filter by turning the check box on or off for the value(s) you want.
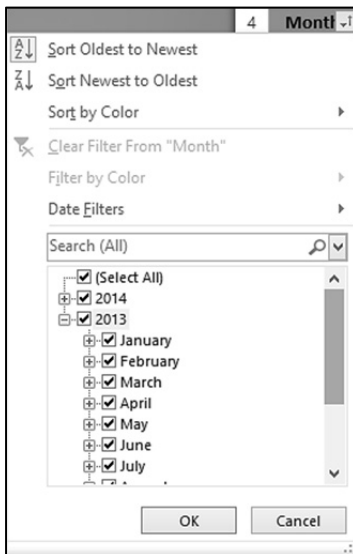
4 Scroll up and click the **Select All** check box to turn it off, then click the **March** and **June** check boxes to turn them on. Click **OK**.

The table now shows only those two rows. Notice the row numbers of the records that remain displayed from the database. Excel hides the rows that do not meet the criteria and displays only records that have a matching value in the filtered field. Excel also changes the AutoFilter icon to indicate that it is using a field to limit the records displayed.

	A	B	C	D	E	F
4	Month	Sales Inquirie	Service Inquirie	Complaints	Other	Total
7	Mar-13	5,861	9,739	7	250	15,857
10	Jun-13	3,146	1,417	12	220	4,795
18	Total	9,007	11,156	19	470	20,652

The conditions you select are called *filter criteria*. You can also set up criteria for text, time, and numeric values.

5 Click the **AutoFilter** icon for the *Month* header again.

6 Point to **Date Filters** then click **Between** in the menu.
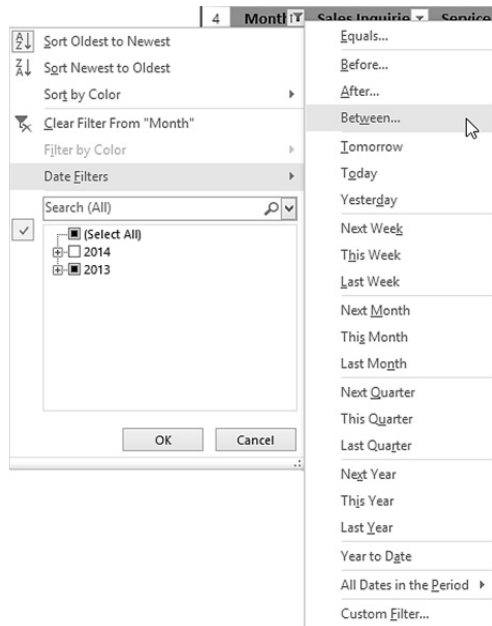
7   Click the Date Picker buttons next to each of the two blank entry fields and select the date range July 1, 2013 to November 30, 2013 so that the dialog box appears as follows:
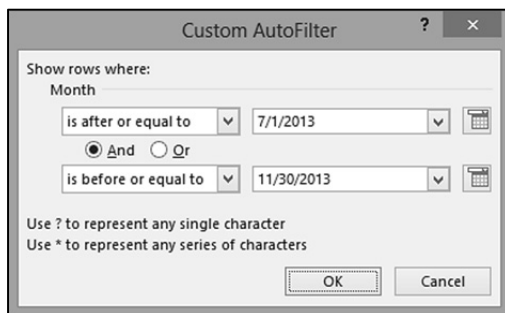
8   Click **OK**.

9   Click the **AutoFilter** icon for the Other header.

10 Click the **Select All** check box to turn it off, then click the **200** check box to turn it on. Click **OK**.

The results should look similar to the following:

4	Month	Sales Inquirie	Service Inquirie	Complaints	Other	Total
11	Jul-13	2,533	7,811	6	200	10,550
14	Oct-13	2,748	8,002	14	200	10,964
18	Total	5,281	15,813	20	400	21,514

Now turn off the filter on the Other column.

11 Click the **AutoFilter** icon for the Other header, then click **Clear Filter From "Other"**.

The table has reverted back to displaying all of the months from July to November. Turn off the filter on the Month column as well.

12 Click the **AutoFilter** icon for the Month header, then click **Clear Filter From "Month"**.

The full table is displayed again.

13 Save and close the workbook.

Removing Duplicate Rows

Excel has the ability to find and remove duplicate data rows from a cell range. This is often a useful feature for worksheets with a lot of data especially when the data came from multiple sources or the data entry system does not have an ability to prevent duplicates from occurring.
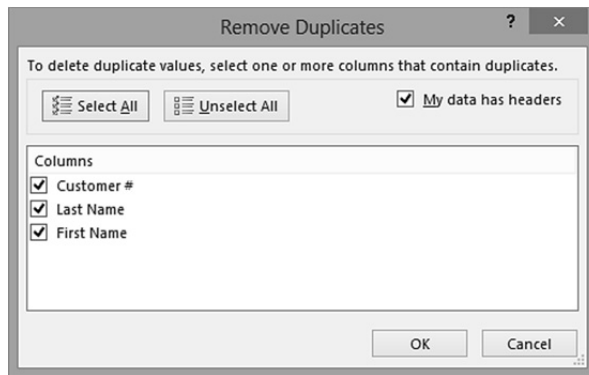
You can select all columns or only selected columns to be used for comparing the data. For example, you can scan a data table containing customer numbers, name, and addresses to find any rows where the same customer is listed two or more times. Alternatively, you can select just the last name and first name columns to find and remove duplicate rows.

On the other hand, Excel will only look for identical data when comparing rows. For example, Excel will consider two rows as different if the address in one row contains "1234 Miller Road" and the other row contains "1234 Miller Rd.". Every blank space, comma, number, and other character in each cell is used to find exact matches.

Learn the Skill

This exercise demonstrates how to use the remove duplicates feature.

1   Open the *Customer List* workbook and save as `Customer List – Student.`

Do you think this list has any duplicate data in it?

2   Scan through the data on your own to see if all rows are unique.

Now use the Remove Duplicates command in Excel.

3   Select any cell in the table.

4   On the Data tab, in the Data Tools group, click **Remove Duplicates**.

5   Click **OK**.

A message box is displayed with the message: "*No duplicate values found.*"

That should be enough to confirm that there are no duplicate rows in the data. Or maybe we did not use the command correctly.

6   Click **OK** to close the message box.

7   On the Data tab, in the Data Tools group, click **Remove Duplicates**.

This time only use the columns that really matter. Turn off the check box for all other columns.

8   Click the **Customer #** check box to turn it off and click **OK**.
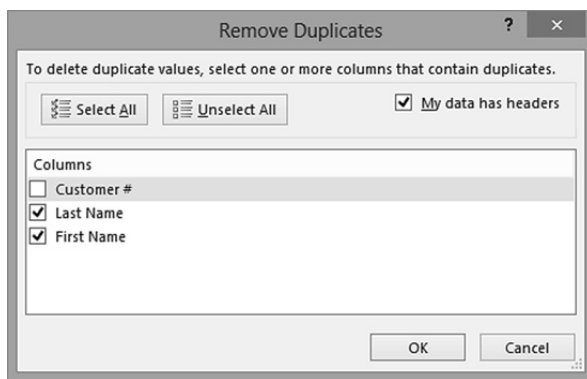
A message box is displayed with the message: "3 duplicate values found and removed; 25 unique values remain."

9 Click **OK** to close the message box.

By comparing the results from the original table, customers 16, 26 and 27 were found to be duplicates.

10 Save and close the workbook.

Outlining

Using Automatic Subtotals

Many worksheets become very large due to the sheer amount of information needed for analysis. Inevitably, summary totals are added for each major group of data as well as grand totals. The end result can be a worksheet that is difficult to see from one end to another.

To help organize the data, Excel provides an automatic outlining tool that enables you to insert subtotals whenever the selected field changes in value. You can make a very big worksheet easier to understand by setting it up so that you see only the subtotals for each group of data. An important step is organizing the data so that the subtotals are displayed for the data groups you want.

With the Outline feature turned on, you can quickly open up all or selected groups of data and collapse them again. Before creating the subtotals, you must sort the data by column to group these related rows together. Otherwise, the results will not make much sense.

You can also create multiple subtotals for a single column or several layers of columns. For example, you can calculate the sum, average, and variance subtotals for as many numeric columns as you require. You must add each different type of subtotal as a separate row to identify the type of subtotal.

You can create a more complex type of multiple subtotals by nesting them. For example, suppose you have a sales report listing every sales transaction for a year. As long as you have a separate column for the month value, you can create subtotals based on the month. You can then create another layer of subtotals based on the date of each sale which is in a different column. Assuming that you will have multiple sales each day, you can nest your subtotals by day of each month and by month of the year. The outline feature then allows you to quickly open or collapse your worksheet at the year, month, or day level.

The key difference in creating multiple subtotals is how you use **Replace current subtotals**. When creating the first (or only) subtotal for a worksheet, ensure this check box is turned on. When creating subsequent subtotals, ensure this check box is turned off.

Learn the Skill

This exercise demonstrates how to create automatic subtotals for one and two numeric columns.

1   Open the *Sales* workbook, and save it as `Sales Subtotal – Student`.

2   Scroll down the worksheet to see how many rows of data are present.

Create an automatic subtotal based on the *Payment Type* but first sort the worksheet by this column.

3   Select any cell in column E.

4   On the Data tab, in the Sort & Filter group, click **Sort A to Z**.

Now create the subtotals on the *Amount Paid* column.

5   On the Data tab, in the Outline group, click **Subtotal**.

6   Click the drop-down button for **At each change in** and select **Payment Type**.

7   In the Use function list box, click the drop-down and select **Sum**.

8   In the Add subtotal to list, click the **Amount Paid** check box to turn it on, and turn off all other check boxes in this list.

9   If necessary, click **Replace current subtotals** and **Summary below data** to turn them on, and clear **Page break between groups** if necessary.
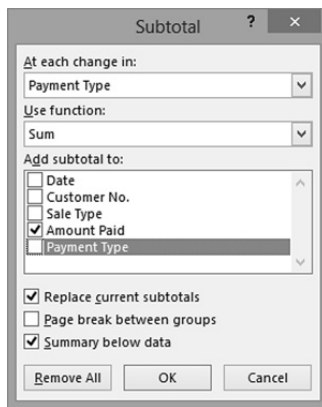
10 Click **OK**. Then scroll down the worksheet to see how the data now appears.

Notice that the worksheet now has three outline levels at the left side. Each of these numbers corresponds to a different level of detail: clicking ⊞1 compresses the data rows so that only the grand total is displayed. Clicking ⊞2 also compresses the data rows but displays the subtotal rows and grand total. Clicking ⊞3 shows all data rows for that level as well as the subtotals and the grand total.

Now practice with the outline features.

11 Click ⊞1 at the top of the outline section and then scroll up to the top of the worksheet.

The ⊞ and ⊟ buttons work the same way as in File Explorer: clicking the ⊞ opens the level and shows the data in the next level. Clicking the ⊟ collapses the details.

Note: You can only use the outline buttons with the mouse.

12 Click ⊞3 to display all rows again.

13 Scroll up and click the ⊟ to the left of the *Mastercard Total* and then scroll up the worksheet for a few more rows.

14 Click ⊞2 at the top of the outline section and then scroll up to the top of the worksheet.

Note: When you remove some subtotals, you remove all subtotal functions. You cannot remove some subtotals and keep the rest.

15 Click ⊞3 to display all rows again.

Now remove all of the subtotals from the worksheet.

16 Click on any cell in the data area to ensure that it is selected, then on the Data tab, in the Outline group, click **Subtotal**.

17 Click the **Remove All** button to clear the subtotals.

You can also calculate two different types of subtotals for the same (or different) column(s) in the worksheet at the same time.

18 On the Data tab, in the Outline group, click **Subtotal**.

19 In the Subtotal dialog box, configure the following settings and click **OK**:

At each change in	Payment Type
Use function	Sum
Add subtotal to	Amount Paid
Replace current subtotals	On
Summary below data	On

20 On the Data tab, in the Outline group, click **Subtotal** again.

21 In the Subtotal dialog box, configure the following settings and click **OK**:

At each change in	Payment Type
Use function	Count
Add subtotal to	Amount Paid
Replace current subtotals	Off
Summary below data	On

Note that when you are adding another subtotal to an existing one, you have to clear **Replace current subtotals**.

**22** Scroll down the data and see how it now appears.

23 Save the workbook.

Manually Grouping and Ungrouping Data

Creating an outline of an Excel worksheet using automatic subtotals is a very useful feature but only if the data are structured consistently, as demonstrated in the previous topic. However, not all worksheets have data designed in such a way that there is a clear break from one group of rows or columns to the next group.

On some worksheets, you need to insert summary functions manually where they are required. To create an outline of a worksheet using this manual grouping method, you must adhere to the following guidelines:

- The worksheet must already contain summation formulas including SUM, SUBTOTAL, or simple addition (+) operators in the rows and/or columns where they need to be.

- The summary formulas must all flow in the same direction. For example, all =SUM formulas must add together cells above or to its left in a single worksheet. If one or more add together other cells to the right or below as well, Excel cannot create an outline.

- The summary formulas can flow in any direction. Although Excel assumes the direction of the summary formulas is above or to the left, you can override these assumptions by changing the settings. On the **Data** tab, in the **Outline** group, click the **Dialog box launcher** to display the Settings dialog box.
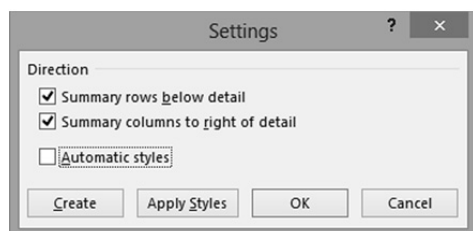
By default, Excel assumes that summation formulas flow to the right and/or below the group data. Uncheck the boxes if the data flow in one of the opposite directions.

- You can have only one outline for each worksheet.

If you are unable to meet any one of these conditions, Excel may not complete the task and you will have to create the outline manually.

As indicated, the automatic outlining tool can be applied to rows and/or columns of data.

Month	Cars	Vans	Off-Road	Total	Truck	Retreads	Heavy	Total	Bicycle	Racing	Total	Grand Total
			Consumer			Industrial				Specialty		Grand
January	63,730	78,027	3,379	145,136	7,347	5,747	826	13,920	6,204	6,070	12,274	171,330
February	42,112	20,479	1,008	63,599	351	2,775	257	3,383	9,101	2,362	11,463	78,445
March	3,379	46,672	8,156	58,207	401	9,804	441	10,646	961	6,956	7,917	76,770
Quarter 1	109,221	145,178	12,543	266,942	8,099	18,326	1,524	27,949	16,266	15,388	31,654	326,545
April	45,494	10,416	5,507	61,417	9,419	3,286	280	12,985	315	1,998	2,313	76,715
May	15,753	16,134	280	32,167	6,016	1,968	911	8,895	131	138	269	41,331
June	32,729	74,073	6,547	113,349	721	5,086	560	6,367	2,263	2,710	4,973	124,689
Quarter 2	93,976	100,623	12,334	206,933	16,156	10,340	1,751	28,247	2,709	4,846	7,555	242,735
July	98,758	9,048	2,318	110,124	3,606	6,578	214	10,398	2,869	7,194	10,063	130,585
August	28,316	81,982	7,163	117,461	1,679	181	665	2,525	4,228	5,835	10,063	130,049
September	9,564	65,635	6,752	81,951	3,168	252	865	4,285	4,314	8,314	12,628	98,864
Quarter 3	136,638	156,665	16,233	309,536	8,453	7,011	1,744	17,208	11,411	21,343	32,754	359,498
October	27,579	89,199	7,524	124,302	9,055	8,135	15	17,205	1,360	2,526	3,886	145,393
November	77,137	46,014	5,948	129,099	5,094	328	831	6,253	4,822	4,473	9,295	144,647
December	81,004	28,013	811	109,828	3,568	5,869	192	9,629	5,277	9,179	14,456	133,913
Quarter 4	185,720	163,226	14,283	363,229	17,717	14,332	1,038	33,087	11,459	16,178	27,637	423,953
Total	525,555	565,692	55,393	1,146,640	50,425	50,009	6,057	106,491	41,845	57,755	99,600	1,352,731

Excel could not create an automatic outline for this worksheet because there are no repeating values to insert the subtotals. Instead, you have to manually insert the subtotals by row after every 3 months (or Quarter), and by column within each product group.

Learn the Skill

This exercise demonstrates how to insert manual subtotals, and then create an outline afterwards.

1 Open the *Sales* workbook again and save as `Sales Grouping – Student`.

Begin by creating a group for the month of January.

2 Scroll down and select row **180**. On the Home tab, in the Cells group, click **Insert**.

3 Enter the following:

Cell	Value or Formula
A180	Subtotal - January
D180	=SUBTOTAL(9,D2:D179)

4 Make a note of the first row of the February sale and write it here: _____

5 Select rows **2** to **179**. You can select this group of rows by starting at the bottom with row 179 and select the rest of the rows in an upward direction, or scroll to the top of the worksheet, start with row 2, and select downwards.

Note: Do not include the row containing the subtotal formula.

6 On the Data tab, in the Outline group, click **Group**.

The group outline bar is now displayed for the January rows.

Repeat these steps for the month of February.

7 Scroll down and select row **332.** Then, on the **Home** tab, in the **Cells** group, click **Insert**.

8 Enter the following:

Cell	Value or Formula
A332	Subtotal - February
D332	=SUBTOTAL(9,D181:D331)

How did you know the range for this SUBTOTAL would start at 181? Because 181 came from the number you wrote down in step 4.

9 Select rows **181** to **331** and then, on the Data tab, in the Outline group, click **Group**.

10 Click ⊟ at the left of the headers for rows 332 and 180 to collapse both groups created so far.

You still have another 10 months' worth of data to group, and the process is beginning to appear tedious and error prone because the SUBTOTAL function must reference the correct cell range. For the remaining 10 months, you can use the same steps but in a different sequence to help streamline the process.

11 Scroll down and insert a new blank row at row 493. You can also use the keyboard shortcut Ctrl + + to insert a blank row.

12 Select rows 333 to 492 and then, on the Data tab, in the Outline group, click **Group**.

When selecting the rows to be grouped together, be sure to not include the blank row in the group.

13 Check that the ⊟ appears at the blank row, similar to the example below:

1 2		A	B	C	D	E
·	489	31-Mar-13	363	Hotel	188.00	Amex
·	490	31-Mar-13	363	Flight+Hotel	2,004.00	Amex
·	491	31-Mar-13	360	Car rental	169.00	Air Miles
·	492	31-Mar-13	309	Nature tour	211.00	Visa
⊟	493					

If you have accidentally left out one or more rows of data, select these missing rows as shown in the following screen example. Then, on the Data tab, in the Outline group, click **Group**. Excel automatically adds these cells to the group.

1 2		A	B	C	D	E	F
·	489	31-Mar-13	363	Hotel	188.00	Amex	
·	490	31-Mar-13	363	Flight+Hotel	2,004.00	Amex	
·	491	31-Mar-13	360	Car rental	169.00	Air Miles	
⊟	492	31-Mar-13	309	Nature tour	211.00	Visa	

14 Click ⊟ at the left of the row header to collapse this group. Alternatively, click ① (to the left of the column label row).

15 Enter the headings for each of these two new groups:

Cell	Value or Formula
A493	Subtotal - March
D493	=SUBTOTAL(9,D333:D492)

How did you know the range for this SUBTOTAL? You have collapsed all of the groups created so far, so just look at the row numbers at the left side of the worksheet. The range for March starts at row 333 because that is the next row after the February subtotal. It ends at row 492 because that is the last row just above the March subtotal.

Now switch to a different workbook in which the grouping and subtotals have already been entered for the months of May to December.

16 Save and close the workbook.

17 Open the *Sales Grouping 2* workbook and save as: `Sales Grouping 2 – Student`.

18 Enter the following:

Cell   Value or Formula
A2015   Grand Total
D2015   =SUBTOTAL(9,D2:D2014)

Set Excel to automatically create the outline for the worksheet.

19 Select a cell inside the data range, such as **C180**.

20 On the Data tab, in the Outline group, click the arrow for **Group,** and then click **Auto Outline**.

Hint: Alternatively, on the Data tab, in the Outline group, click the Dialog box launcher to display the Settings dialog box.

A message box appears with the question, "Modify existing outline?" This message is displayed because you had already created groups in this worksheet. You could have inserted the SUBTOTAL formulas into the worksheet without the grouping. The automatic outlining tool would then have created all of the monthly groups for you. However, for this exercise, you used the monthly groupings to help you enter the correct ranges for each SUBTOTAL.

Your data with the manually inserted groupings and subtotals is now converted to an outlined group.

21 Click **OK**.

Collapse and expand the worksheet using the outline buttons to confirm that it is working properly as an outlined group.

22 Click the ⬚¹ , ⬚² , ⊕ , and ⊖ buttons to view different outline levels of the data.

The worksheet should look something like the following when the ⬚² button is clicked.

Note: When you use the automatic outlining feature, you will not be able to undo it using the **Undo** button on the Quick Access Toolbar.

23 Save the workbook.

24 On the Data tab, in the Outline group, click the arrow for **Ungroup**, and click **Clear Outline**.

All of the groupings have now been removed. The workbook has already been saved with the groupings so discard this version with the groupings removed.

25 Close the workbook and discard the changes.

Lesson Summary

In this lesson, you learned various ways of organizing data to improve your ability to analyze it. You should now be able to:

☑ create, modify, and delete range names

☑ use Go To to jump to a cell or named range

☑ convert a range of data to a table

☑ modify a table by adding and deleting rows and columns of data

☑ apply and remove formatting on a table, and remove a sparkline chart

☑ sort data

☑ use filtering on data

☑ remove duplicate rows of data

☑ outline and group data using automatic subtotals

☑ outline and group data by manually inserting subtotals

Review Questions

1. Give examples of why you might want to name cell ranges instead of using the cell references.

2. What restrictions are in place regarding range names?

3. What can you use the Name Manager for?

4. To create a table, the following conditions must be met (select all that apply):
   a) The data in the range of cells must be contiguous.
   b) All of the data must be of the same type, such as text, numbers, or dates but not a mixture.
   c) The data can be arranged in row or column order.
   d) Any range names must be removed first before creating the table.
   e) There must be a header at the top of each column and the data listed below.

5. Banding a table means to (select all that apply):
   a) Discard the contents of a table.
   b) Apply a light and dark shade of a color to alternating rows of a table.
   c) Apply a "band-aid" fix to the table data.
   d) Apply a light and dark shade of a color to alternating columns of a table.
   e) Create a musical performing group to headline the latest chart hits.

6. What is the difference between sorting and filtering?

7. Why do you need to tell Excel whether you have headers in the data?

8. Provide an example of when you might set up multiple levels for sorting.

9. Which of the following comparison operators can be used for filtering text, numbers, and dates (select all that apply):

a)	Above average	f)	Begins with
b)	Greater than	g)	Next month
c)	Top 10	h)	Contains
d)	Equals	i)	Does not equal
e)	Between	j)	Greater than or equal to

10. The Remove Duplicates feature will reliably delete all rows that contain duplicate data even though the data may have minor variations such as extra blanks, commas, or different spellings.

    a.   True   b.   False

11. The automatic outline feature allows you to (select all that apply):

    a) Insert a sum subtotal for one or more columns of data.

    b) Automatically sort your data.

    c) Insert one or more subtotals – for example, sum, average, and variance – for the same column of data with each subtotal being in a separate subtotal row.

    d) Nest your data with multiple subtotal levels.

    e) Set the filter criteria using a wide variety of different comparison operators.