ICDL ADVANCED SPREADSHEETS

Syllabus 2.0
Learning Material (MS Excel 2013)

ICDL Advanced Spreadsheets

This ICDL Advanced Spreadsheets module is designed to further your spreadsheet application skills to an expert level, allowing you to master the advanced functions of spreadsheet applications, enabling them to produce more sophisticated reports, and to perform complex mathematical and statistical calculations. This will help you save time and improve productivity when working with spreadsheets.

On completion of this module the candidate will be able to:

- Apply advanced formatting options, such as conditional formatting and customised number formatting, and handle worksheets.
- Use functions such as those associated with logical, statistical, financial and mathematical operations.
- Create charts and apply advanced chart formatting features.
- Work with tables and lists to analyse, filter and sort data. Create and use scenarios.
- Validate and audit spreadsheet data.
- Enhance productivity by working with named cell ranges, macros and templates.
- Use linking, embedding and importing features to integrate data.
- Collaborate on and review spreadsheets. Apply spreadsheet security features.

What are the benefits of this module?

Upon completion of this module, you will become more confident, efficient and effective in using a spreadsheet application. It will prove your mastery of this application, and allow you to operate at an expert level when using spreadsheets. Once you have developed the skills and knowledge set out in this book, you will be in a position to become certified in an international standard in this area - ICDL Advanced Spreadsheets.

For details of the specific areas of the ICDL Advanced Spreadsheets syllabus covered in each section of this book, refer to the ICDL Advanced Spreadsheets syllabus map at the end of the book.

How to use this book
This book covers the entirety of the ICDL Advanced Spreadsheets course. It introduces important concepts and sets out the specific steps associated with using different features of the application. You will also have the opportunity to practice some of these activities yourself using sample files provided in the Student Folder. It is recommended that you do not save your changes to sample files, as you may want to practice an activity more than once.

ICDL ADVANCED SPREADSHEETS

LESSON 1 -
USING CONDITIONAL AND CUSTOM FORMATS

In this section, you will learn about:

- Applying an autoformat/table style to a cell range
- Applying conditional formats
- Changing a conditional format
- Adding a conditional format
- Using data bars
- Deleting a conditional format
- Creating a custom number format

1.1 APPLYING AN AUTOFORMAT/TABLE STYLE TO A CELL RANGE
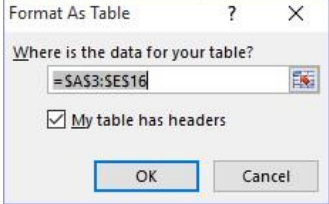
💡 Concepts

A range of cells can be formatted using one of the preset table styles from the Table Styles gallery.

👣 Steps

Open **Table Style.xlsx** file. Display the **Traffic** worksheet.

1.	Select the range of cells to which you wish to apply a preset table style. *The range of cells is selected.*	Select cells **A3:E16**
2.	Select the **Format as Table** button in the **Styles** group on the **HOME** tab. *The drop-down menu opens.*	Click Format as Table
3.	Choose a table style from the drop-down menu, e.g. Light, Medium, or Dark.	Table Style Light 8
4.	In the **Format As Table** window, confirm that the cell range displayed in the **Where is the data for your table**? box is correct.	
5.	Tick the **My table has headers** box if applicable. Click OK and the cell range will be converted to the selected table style.	

1.2 APPLYING CONDITIONAL FORMATS

Concepts

Conditional Formatting helps the user to analyse data in a table by highlighting cells in a specified range that meet conditions or criteria applied by the user. An example of conditional formatting is to highlight cells in a specified range that are greater than 100 but less than 200. For more advanced analysis, one or more conditions can be applied in conditional formatting.
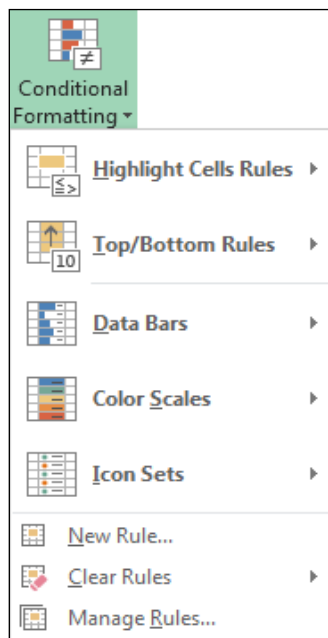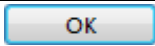
Steps

Apply the **Highlight Cells Rules** or **Top/Bottom Rules** options in conditional formatting.

Open **Conditional Formatting.xlsx** file. Display the **Traffic** worksheet.

1. Select the range of cells to which you wish to apply a conditional format. *The range of cells is selected.*	Select cells **B4:B15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The **Conditional Formatting** menu opens.*	Click

3. Point to the **Highlight Cells Rules** or the **Top/Bottom Rules** option. *The appropriate submenu opens.*	Point to [icon] Highlight Cells Rules ▶
4. Select the desired option. *The criteria appears in the boxes.*	Click [icon] Greater Than...
5. Enter the value(s) you want to use as the criteria in the appropriate box(es), if applicable. *The appropriate dialog box opens.*	Type **150000** in the **Format cells that are GREATER THAN** box
6. Select the formatting list on the right of the dialog box. *A list of available options is displayed.*	Click [▼]
7. Select the desired formatting option. *The formatting option is selected.*	Click **Light Red Fill**
8. Select **OK**. *The dialog box closes, and the conditional formatting is applied to the selected cells.*	Click [OK]

Click on any cell to deselect the range. Notice that the cells with values greater than **150000** are displayed with a light red fill color.
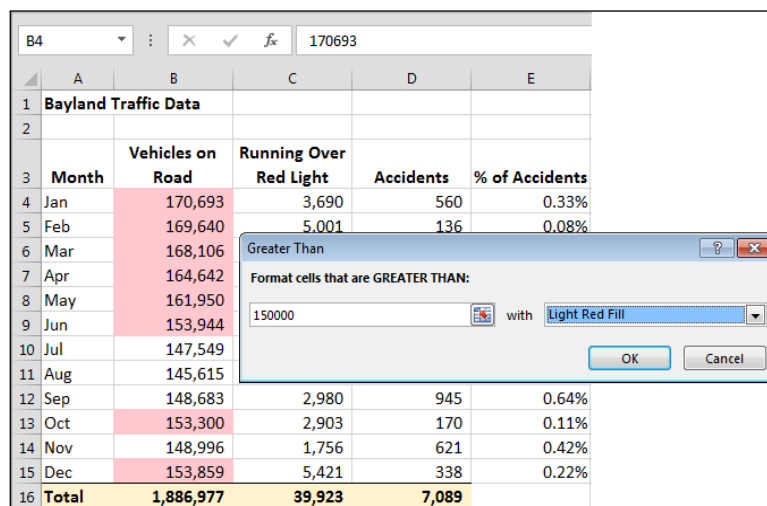
Practice the concept: Change the number in cell **B11** to **165615** and press **[Enter]**.
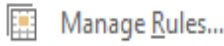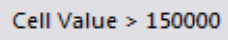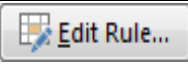
The cell's fill color changes to red because the number is now greater than **150000**.
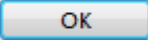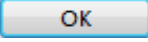
1.3 CHANGING A CONDITIONAL FORMAT

👣 Steps

Edit a conditional formatting rule.

Display the **Traffic** worksheet.

1. Select the range of cells to which you wish to apply a conditional format. *The range of cells is selected.*	Select cells **B4:B15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The **Conditional Formatting** menu opens.*	Click Conditional Formatting ▾
3. Select the **Manage Rules** option. *The **Conditional Formatting Rules Manager** dialog box opens.*	Click Manage Rules...
4. Select the rule you want to change. *The selected rule is highlighted.*	Click Cell Value > 150000
5. Select the **Edit Rule** button. *The **Edit Formatting Rule** dialog box opens.*	Click Edit Rule...
6. If you wish to change the condition, select the condition list. *A list of available options is displayed.*	Click the second ▾ (currently greater than ▾)
7. Select the new condition. *The new condition appears in the box.*	Click **less than**

8. If you wish to change the criterion, select the current criterion. *The condition or criterion is selected.*	Double-click **150000**
9. Enter the new criterion. *The new criterion appears in the box.*	Type **160000**
10. Select **OK**. *The **Edit Formatting Rule** dialog box closes.*	Click OK
11. Select **OK**. *The **Conditional Formatting Rules Manager** dialog box closes. The edited conditional formatting rule is applied to the selected cells.*	Click OK

Click on any cell to deselect the range. Notice that the fill color of cells with values less than **160000** is light red.
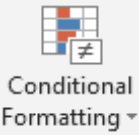
1.4 CHANGING A CONDITIONAL FORMAT
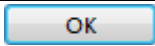
Steps

Add a second conditional format to a range.

Display the **Traffic** worksheet.

1. Select the range of cells to which you wish to apply a second conditional format. *The range of cells is highlighted as you drag.*	Select cells **B4:B15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The **Conditional Formatting** menu opens.*	Click Conditional Formatting

3. Point to the **Highlight Cells Rules** or the **Top/Bottom Rules** option. *The appropriate submenu opens.*	Point to Highlight Cells Rules ▶
4. Select the desired option. *The appropriate dialog box opens.*	Click Greater Than…
5. Enter the value(s) you want to use as the criteria in the appropriate box(es), if applicable. *The criteria appears in the boxes.*	Type **165000** in the **Format cells that are GREATER THAN** box
6. Select the formatting list on the right of the dialog box. *A list of available options is displayed.*	Click ▼
7. Select the desired formatting option. *The formatting option is selected.*	Click **Green Fill with Dark Green Text**
8. Select **OK**. *The dialog box closes, and the conditional formatting is applied to the selected cells.*	Click OK

Click on any cell to deselect the range. Notice that the font color of cells with values greater than **165000** is dark green and the cells have a light green fill. The existing conditional formatting, of the light red fill color for cells with values less than **160000**, still applies.
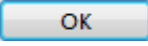
1.5 CREATING A CUSTOM CONDITIONAL FORMAT
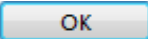
Steps

Create customised conditional formats using **Top/Bottom Rules**.

Display the **Traffic** worksheet.

1. Select the range of cells to which you wish to apply a custom conditional format. *The range of cells is highlighted as you drag.*	Select cells **B4:B15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The Conditional Formatting menu opens.*	Click Conditional Formatting ▾
3. Point to the **Highlight Cells Rules** or the **Top/Bottom Rules** option. *The appropriate submenu opens.*	Point to Top/Bottom Rules ▶
4. Select the desired option. *The appropriate dialog box opens.*	Click Top 10 Items...
5. Enter the value(s) you want to use as the criteria in the appropriate box(es), if applicable. *The criteria appears in the boxes.*	Click the value 🔼 to 5
6. Select the formatting list on the right of the dialog box. *A list of available options is displayed.*	Click ▾
7. Select the **Custom Format** option. *The Format Cells dialog box opens.*	Click **Custom Format**
8. Select the required tab. *The required tab is displayed.*	Click **Font**, if necessary
9. Select the formatting, as desired. *The desired formatting is selected.*	Click **Bold** in the **Font Style** list box
10. Select **OK**. *The Format Cells dialog box closes.*	Click OK
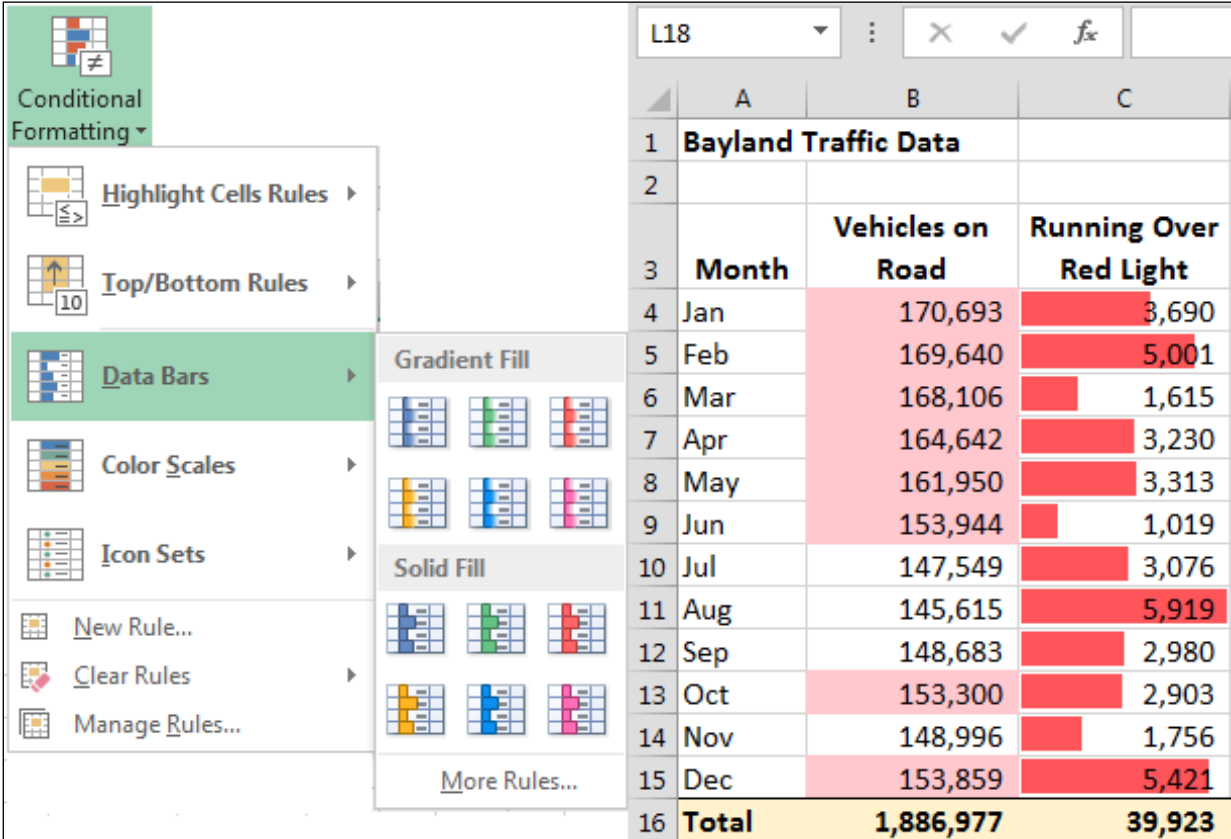
11. Select **OK**. *The dialog box closes, and the customised conditional formatting is applied to the selected cells.*	Click [OK]

Click on any cell to deselect the range. Notice that the cells containing the five highest values now have a bold font style. Also, the existing conditional formatting still applies.

1.6 USING DATA BARS

💡 Concepts

Data bars display a band of color across the cell; the band's width depends on the value of the cell.

👣 Steps

Apply conditional formats using **Data Bars**.

Display the **Traffic** worksheet.

1. Select the range of cells to which you wish to apply a custom conditional format. *The range of cells is highlighted as you drag.*	Select cells **C4:C15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The Conditional Formatting menu opens.*	Click Conditional Formatting ▾
3. Point to the **Data Bars** option. *The Data Bar gallery opens.*	Point to Data Bars ▸
4. Select the desired option. *The gallery closes, and the selected conditional formatting is applied to the selected cells.*	Under the **Solid Fill**, click **Red Data Bar**

Click on any cell to deselect the range. Notice that the red data bars in the cells vary in width depending on the value of the data in the cells. The higher the value, the wider the data bar.

Practice the concept:

1. Select cells **D4:D15** and apply **Gradient Orange Data Bars** to the range.

2. Select cells **E4:E15**.

3. Display the **Icon Sets** gallery, then apply the **3 Flags Indicator** icon set.

4. Modify the rule so that the icons display in reverse order.

5. Click on any cell to deselect the range.

	D	E
1		
2		
3	**Accidents**	**% of Accidents**
4	560	0.33%
5	136	0.08%
6	900	0.54%
7	390	0.24%
8	153	0.09%
9	751	0.49%
10	997	0.68%

1.7 DELETING A CONDITIONAL FORMAT

Steps

Clear conditional formatting rules.

1. Select the range of cells from which you wish to clear the conditional formatting. *The range of cells is selected.*	Select cells **D4:D15**
2. Select the **Conditional Formatting** button in the **Styles** group on the **HOME** tab. *The **Conditional Formatting** menu opens.*	Click Conditional Formatting ▾
3. Point to the **Clear Rules** option. *The **Clear Rules** submenu opens.*	Point to Clear Rules ▸
4. Select the desired option. *The menu closes and all conditional formatting rules are cleared from the selected cells or the worksheet.*	Click **Clear Rules from Selected Cells**

Click on any cell to deselect the range. Notice that the data bars no longer appear.

Practice the concept:

1. Select cells **B4:B15**.

2. Open the **Conditional Formatting Rules Manager**.

3. Select the **Top 5** rule, then click the **Delete Rule** button.

4. Click **OK**.

5. Click on any cell to deselect the range.

6. Notice that the bold font style no longer applies to the five highest values.

1.8 CREATING A CUSTOM NUMBER FORMAT

Concepts

The number format feature allows you to change the way a number is displayed without changing the number. There are several number formats to choose from, General, Number, Currency, Custom, etc. When none of the available formats meet your needs you can use custom format to create a new custom number format from scratch, or change or edit an existing number format and then add it to the existing list of custom number formats.

Text, hyphens, and symbols can be used in the creation of a custom format. There are several conventions to follow when creating a custom number:

1. Use the 0 (zero) placeholder to display zeros when there are fewer digits then zeros in a format to display, for example to display 9.2 as 9.20 use the format #.00

2. Use the # placeholder if you do not want extra zeros displayed when the number has less digits on either side of the decimal point than there are # symbols in the format. For example a custom format #.## will display 3.4 in the cell and will not display 3.40 if only 3.4 is entered into the cell.

3. A custom format can have a maximum of four sections of code with each one separated by semicolons. The sections define the format in the following order: Positive numbers; Negative numbers; Zero values; Text values.

Note: A custom number format does not need to have four sections of code. If only two sections are used in the design of the custom format then the first section is used for positive numbers and zeros and the second section is used for negative numbers.

4. Each section of a custom format can display colour by entering a colour in brackets at the beginning of each section, for example [Yellow][<=50];[Green][>50]

5. To display text in a custom number format enclose the text with quotes " "

You can access a custom number format by selecting **Custom** from the **Category** list on the **Number** page in the **Format Cells** dialog box; all custom number formats will then appear in the **Type** list box.
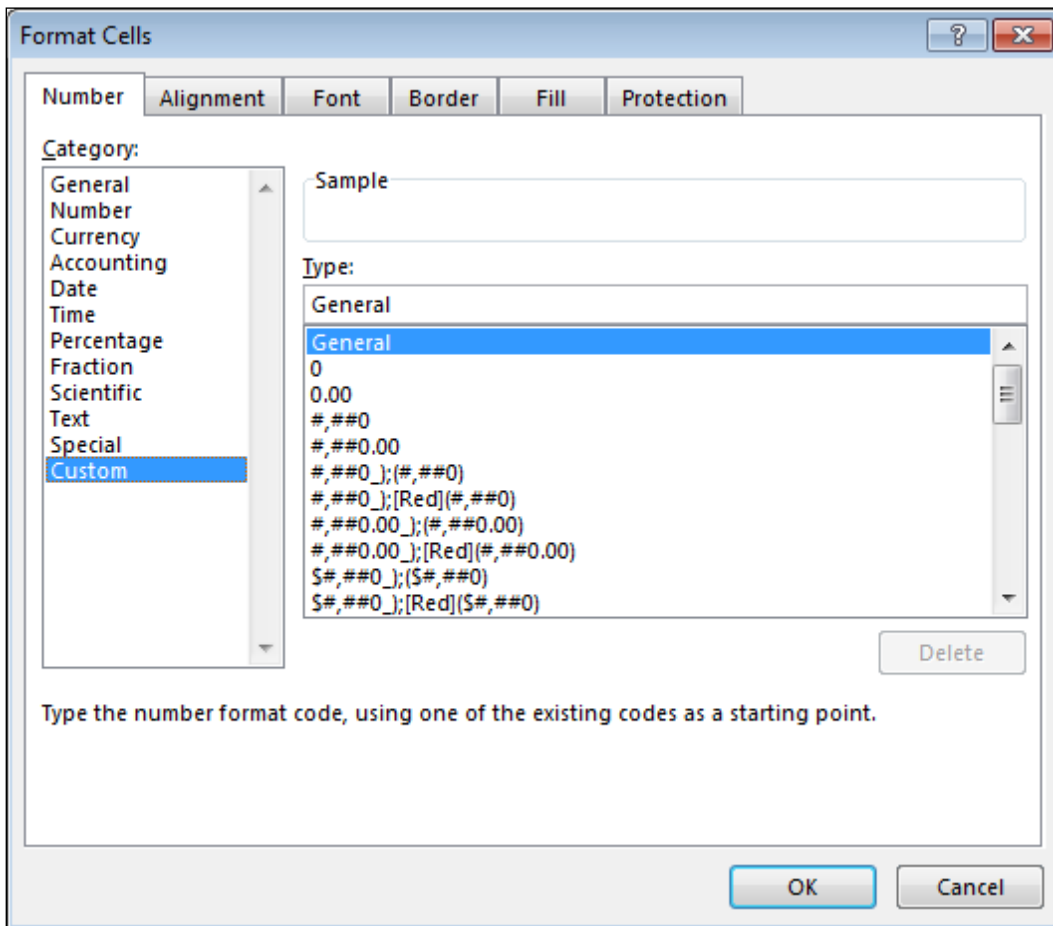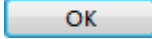
👣 Steps

Create a custom number format.

Display the **Officers** worksheet. You will create a custom text format that displays the text **SN-** before numeric values in a column.

1. Select the cells to which you want to apply a custom number format. *The range of cells is selected.*	Select cells **A4:A9**

2. Select the **Format** button in the **Cells** group on the **HOME** tab. *The **Format** menu opens.*	Click ⊞ Format ▾
3. Select the **Format Cells** option. *The **Format Cells** dialog box opens.*	Click ▤ Format Cells...
4. Select the **Number** tab. *The **Number** page displays.*	Click the **Number** tab, if necessary
5. Select **Custom** from the **Category** list. *A list of available custom formats is displayed in the **Type** list box.*	Click **Custom**
6. Place the insertion point at the desired location in the **Type** box. *The insertion point appears at the desired location in the **Type** box.*	Click at the beginning of the text in the **Type** box (do not delete anything in the text box)
7. Customize the format as desired. *The changes appear in the **Type** box.*	Type **"SN-"**
8. Select **OK**. *The **Format Cells** dialog box closes, and the custom format is applied to the selection.*	Click OK

Click on any cell to deselect the range.

Close **Conditional Formatting.xlsx** file.

1.9 REVIEW EXERCISE

Use conditional formatting and custom formats in a worksheet

1. Open **Order Records.xlsx** file.

2. Apply the following conditional formatting to the range **D6:D15**

   - Cells with values greater than 400 display in **Green Fill with Dark Green Text**.

   - Cells with values less than 50 display in red text and bold.

3. Apply solid purple data bars to the range **C6:C15**.

4. Modify the rule for cell with values less 50 in the range **D6:D15** so that it includes a light blue fill.

5. Clear the conditional formatting for the cell range **E6:E15**.

6. Delete the conditional formatting for cell with values greater than 400 in the range **D6:D15**.

7. Select **E6** and create a custom number format that displays positive numbers in blue, with the currency format and 2 decimal places, and negative numbers in red, with parentheses, the currency format, and 2 decimal places.

   *(**Hint**: Use the $#,##0.00_);[Red]($#,##0.00) custom format and add the color blue to the positive numbers.)*

8. Copy the custom format to the cell range **E7:E15**.

9. Create a custom number format to the cell range **A7:A15** so that it begins with "**ON:**".

10. Close the workbook without saving it.

LESSON 2 - USING TEMPLATES

In this section, you will learn about:

- Copying worksheets
- Hiding columns and rows
- Unhiding columns and rows
- Saving a workbook as a template
- Using a template
- Editing a template
- Inserting a new worksheet
- Hiding/unhiding a worksheet
- Deleting a template
- Finding online templates

2.1 COPYING WORKSHEETS

💡 Concepts
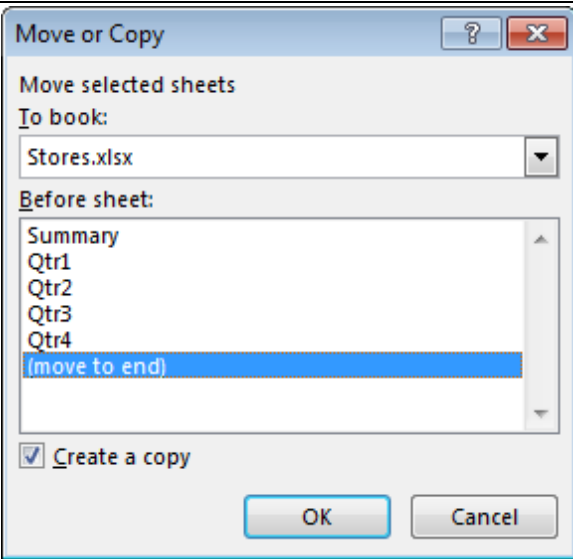
The Copy/Move option is used to copy or move worksheets between spreadsheets.

👣 Steps
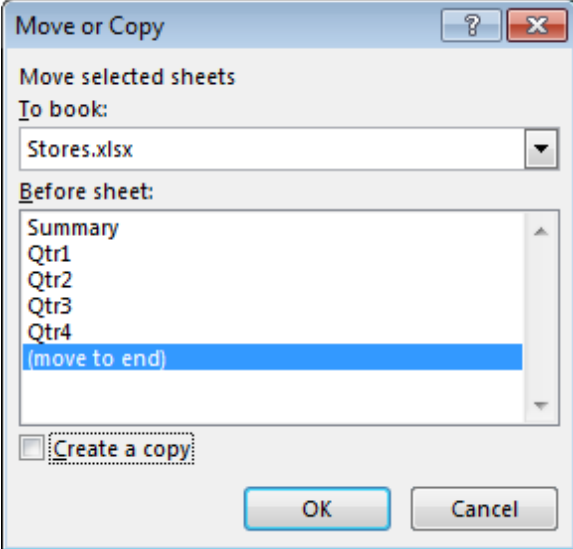
To copy or move a worksheet from **Store Catalog.xlsx** to **Stores.xls.**

Open both **Store Catalog.xlsx** file and **Stores.xls**.

To copy the **Wheels** tab in **Store Catalog.xlsx** to **Stores.xls**

1. In the **Store Catalog.xlsx** file, select the tab of the worksheet you want to copy or move to **Stores.xls** *The worksheet tab(s) is selected.*	Click the **Wheels** tab
2. Right-click on the **Wheels** tab and select Move or Copy. *The Move or Copy Dialog is displayed.*	Click **Move or Copy**
3. To copy the **Wheels** tab to **Stores.xls**, select **Stores.xlsx** in the To book: box.	Select **Stores.xlsx**
4. Select **(move to end)** in the Before sheet: box	Click **(move to end)**
5. Click the Create a copy box so that it displays a check mark and click OK.	

To move the **Wheels** spreadsheet in **Store Catalog.xlsx** to **Stores.xlsx**

1. In the **Store Catalog.xlsx** file, select the tab of the worksheet you want to move to **Stores.xls** *The worksheet tab(s) is selected.*	Click the **Wheels** tab
2. Select the **Wheels** tab, and select Move or Copy. *The Move or Copy Dialog is displayed.*	Right-click on the **Wheels** tab and click Move or Copy
3. To move the **Wheels** tab to **Stores.xlsx**, select **Stores.xlsx**. *The sheets in the **Stores.xlsx** workbook are listed in the **Before sheet** box.*	Click **Stores.xlsx** in the **To book:** box
4. Select **(move to end)** in the **Before sheet:** box	Click **(move to end)**
5. Make sure that the **Create a copy** box does NOT display a check mark and click **OK**.	

Close both **Store Catalog.xlsx** and **Stores.xlsx** and do not save.

2.2 HIDING COLUMNS AND ROWS

Steps

Hide columns and rows in a worksheet.

Open **Regional Report.xlsx** file. If necessary, display the **Central** worksheet.

1. Select the columns or rows you want to hide. *The columns or rows are highlighted.*	Select rows **3** through **5**
2. Right-click on any of the selected columns or rows headings. *A shortcut menu displays.*	Right-click anywhere in the selected row headings
3. Select the **Hide** option. *The columns or rows are hidden.*	Click **Hide**

Practice the concept:

Hide columns **B** through **E**.

You can also hide a worksheet by right-clicking on the worksheet tab, and selecting **Hide**.

2.3 UNHIDING COLUMNS AND ROWS

Steps

Unhide columns and rows in a worksheet.

1. Select a column or row on each side of the hidden columns or rows, so that the hidden columns or rows are included in the selection. *The columns or rows are highlighted.*	Select rows **2** through **6**
2. Right-click on any of the selected columns or rows headings. *A shortcut menu displays.*	Right-click anywhere in the selected row headings
3. Select the **Unhide** option. *The previously hidden columns or rows now display in the worksheet.*	Click **Unhide**

You can also unhide a worksheet:

1. Right-click any of the worksheet tabs on either side of the hidden worksheet.

2. Select **Unhide**.

3. Select the sheet to show and click **OK**.

Practice the concept:

Unhide columns **B** through **E**.

Then click any cell to deselect the range.

Close **Regional Report.xlsx** file.

2.4 SPLIT A WINDOW. MOVE, REMOVE SPLIT BARS

Steps

Open **Regional Report.xlsx** file. Display the **Central** worksheet.

Split a window

1. Select location for split.	Highlight row 2.
2. Click the **VIEW** tab and in the Window group click the Split command.	Split

Move split bar

1. Place the cursor on the split bar.	Place the cursor
2. While pressing the left mouse button, drag the split bar to the new location.	Drag the split bar

Remove the split bar

1. Click the **VIEW** tab and in the Window group click the Split command which is an ON/OFF toggle key.	Split

Close **Regional Report.xlsx** file.
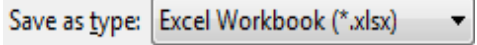
2.5 SAVING A WORKBOOK AS A TEMPLATE

Steps

Save the workbook as a template.

Open **Travel Claims.xlsx** file.

1. Select the **FILE** tab. *The **Backstage** view opens.*	Click **FILE**
2. Select the **Save As** option. *The **Save As** page is displayed.*	Click **Save As**
3. Select the **Computer** option. *The **Recent Folders** is displayed.*	Click **Computer**
4. Select **Browse**. *The **Save As** dialog box opens.*	Click **Browse**
5. Type the name for the template. *The text appears in the **File name** box.*	Type **Travel Claim Form**
6. Select the **Save as type** list. *A list of available file types is displayed.*	Click Save as type: Excel Workbook (*.xlsx) ▼
7. Select **Excel Template**. ***Excel Template** appears in the **Save as type** box, and the contents of the **Custom Office Templates** folder are displayed.*	Click **Excel Template**
8. Select **Save**. *The **Save As** dialog box closes, and the file is saved as a template in the **Custom Office Templates** folder.*	Click Save

Close **Travel Claim Form.xltx** file.

2.6 USING A TEMPLATE

Steps

Use a template to create a workbook.

1. Select the **FILE** tab. *The **Backstage** view opens.*	Click **FILE**
2. Select the **New** option. *The **New** page is displayed.*	Click **New**
3. Click on the **PERSONAL** option. *The thumbnails of saved templates appears.*	Click **PERSONAL**
4. Select the desired template. *A new workbook based on the template opens.*	Click **Travel Claim Form**
5. Add the desired data to the workbook. *The data appears in the workbook.*	Enter the following in the cell range indicated: • **B6** **Training** • **B8** **March** • **B11** **Taxi fare** • **B12** **Return to office** • **I11** **25** • **I12** **28**
6. Press function key [**F12**] on the keyboard. *The **Save As** dialog box opens with the text in the **File name** box selected.*	Press [**F12**]
7. Type the desired file name. *The text appears in the **File name** box.*	Type **Training Claim**
8. Select the double arrow at the left of the **Address** bar. *A list of available drives and common folders are displayed.*	Click «

9. Select the drive and folder where you want to save the workbook.	Click the data files drive and folder
10. Select **Save**. *The **Save As** dialog box closes, and the new workbook based on the template is saved.*	Click

Close **Training Claim.xlsx** file.
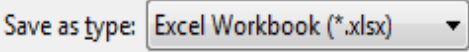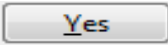
2.7 EDITING A TEMPLATE

 Steps

Edit a template.

1. Select the **FILE** tab. *The **Backstage** view opens.*	Click **FILE**
2. Select the **New** option. *The **New** page is displayed.*	Click **New**
3. Click on the **PERSONAL** option. *The thumbnails of saved templates appears.*	Click **PERSONAL**
4. Select the desired template. *A new workbook based on the template opens.*	Click **Travel Claim Form**
5. Make the desired changes. *The contents or formatting of the workbook are changed as applicable.*	Click on the image at the top of the worksheet and press [**DELETE**]
6. Press function key [**F12**] on the keyboard. *The **Save As** dialog box opens, with the text in the **File Name** box selected.*	Press [**F12**]

7. Type the name for the template. *The name appears in the **File name** box.*	Type **Travel Claim Form**
8. Select the **Save as type** list. *A list of available file types is displayed.*	Click Save as type: Excel Workbook (*.xlsx) ▼
9. Select **Excel Template**. ***Excel Template** appears in the **Save as type** box, and the contents of the **Custom Office Templates** folder are displayed.*	Click **Excel Template**
10. Select **Save**. *A Microsoft Excel warning box opens, asking if you want to replace the existing file.*	Click Save
11. Select **Yes**. *The Microsoft Excel warning box and the **Save As** dialog box closes, and the edits to the template are saved.*	Click Yes

Close the template.

Practice the concept:

Create a new workbook from the **Travel Claim Form** template.

Notice that the image at the top of the worksheet no longer appears.

Then, close the new workbook without saving it.
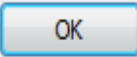
2.8 INSERTING A NEW WORKSHEET

Steps

Insert a new worksheet based on a template.

Open **East Claims.xlsx** file.
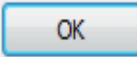
1. Right-click the tab before which you want to insert a worksheet. *A shortcut menu opens.*	Right-click the **Sales** tab
2. Select the **Insert** option. *The Insert dialog box opens.*	Click **Insert**
3. Select the desired tab. *The corresponding page is displayed.*	Click the **Spreadsheet Solutions** tab
4. Select the desired template. *A preview of the template appears in the Preview box, if available.*	Click **Expense Report**
5. Select **OK**. *The Insert dialog box closes, and a worksheet based on the selected template appears in the workbook.*	Click [OK]

2.9 HIDING/UNHIDING A WORKSHEET

Steps

Hide or unhide a worksheet.

1. Right-click the tab which you want to hide and select the **Hide** option. *The selected worksheet is hidden.*	Right-click the **Estimate** tab and choose **Hide**
2. Right-click on any of the sheet tabs. *A shortcut menu opens.*	Right-click the **Sales** tab
3. Select the **Unhide** option. *The Unhide dialog box appears.*	Click **Unhide**
4. Select the sheet you want to unhide and then click **OK**. *The dialog box closes and the selected worksheet is unhidden.*	Select **Actual**, and then click [OK]
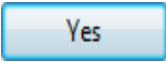
Close **East Claims.xlsx** file.

2.10 DELETING A TEMPLATE

Steps

Delete a template.

1. Select the **FILE** tab. *The **Backstage** view opens.*	Click **FILE**
2. Select the **Open** option. *The **Open** page is displayed.*	Click **Open**
3. Click on the **Computer** option. *The list of recent locations appears.*	Click **Computer**
4. Select the **Custom Office Templates**. *The **Open** dialog box opens.*	Click **Custom Office Templates**
5. Right-click the template you want to delete. *A shortcut menu appears.*	Right-click **Travel Claim Form**
6. Select the **Delete** option. *The **Delete File** message box opens, asking you to confirm the deletion.*	Click **Delete**
7. Select **Yes**. *The **Delete File** message box closes, and the template is deleted.*	Click Yes
8. Select **Cancel**.	Click Cancel

2.11 FINDING ONLINE TEMPLATES

Steps

Find online template.

Note: You will need active Internet connection to complete the following steps. Open the **New** page by selecting the **FILE** tab and the **New** option.

1. Select the **Search for online templates** box. *The insertion point appears in the Search for online templates text box.*	Click the **Search for online templates** box
2. Type one or more keywords relating to the template you want to find. *The text appears in the Search for online templates box.*	Type **work schedule**
3. Press [**ENTER**]. *The page displays the templates that match the keywords.*	Press [**ENTER**]
4. Select the desired template from the results. *The preview of the template displays.*	Click **Weekly work schedule**
5. Select **Create** to download the current template. *Excel creates a new workbook based on the template.*	Click **Create**

Close the **Weekly work schedule1** workbook without saving the changes.

Online Templates in Excel

2.12 REVIEW EXERCISE

Create and use templates

1. Open **Inventory.xlsx** file.

2. Save the workbook as a template called **Stock Checklist**. Close the template.

3. Use the **Stock Checklist** template to create a new workbook.

4. In the new workbook, change the labels to **On Location** and **Warehouse** in the range **C7:D7**.

5. Change the label in **A3** to read **Month**.

6. Hide row **5**.

7. Save the workbook as **Cafe Checklist**.

8. Open **Re-Inventory.xlsx** file.

9. Use the **Paste Special** feature to increase the current reorder level of each product by the cell value in **D6**. (*Hint: Copy cell **D6**, then highlight range **D9:D22**, right-mouse click, **Paste Special,** select **Add** under operation*)

10. Use **Paste Special** feature to transpose range **A8:B22** to range **A26:O27**.

11. Close the workbook.

LESSON 3 -
SORTING AND VALIDATING DATA

In this section, you will learn about:

- Creating subtotals in a list
- Removing subtotals from a list
- Sorting data by multiple levels
- Using custom sort
- Using data validation
- Validating data using a list
- Creating a custom error message
- Removing data validation

3.1 CREATING SUBTOTALS IN A LIST

💡 Concepts

When a list is sorted by the values in a column, records containing the same values are grouped together. Once a list is grouped, subtotal allows you to quickly calculate rows of related data by inserting subtotals and totals.

Year	Country	Sales
2011	Singapore	100
2011	Japan	150
2011	India	250
2012	Singapore	380
2012	Japan	490
2012	India	550
2013	Singapore	340
2013	Japan	500
2013	India	600
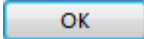
Year	Country	Sales
2011	Singapore	100
2011	Japan	150
2011	India	250
2011 Total		500
2012	Singapore	380
2012	Japan	490
2012	India	550
2012 Total		1420
2013	Singapore	340
2013	Japan	500
2013	India	600
2013 Total		1440
Grand Total		3360

👣 Steps

Create subtotals in a list.

Open **Employees List.xlsx** file. Display the **List** worksheet.

1. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
2. Select a cell in the column containing the entries you want to use for grouping. *The cell is selected.*	Click cell **E3**
3. Select the desired sort order from the buttons in the **Sort & Filter** group. *The list is sorted based on the entries in the selected column.*	Click ↕

4. Select the **Subtotal** button in the **Outline** group. *The **Subtotal** dialog box opens.*	Click Subtotal
5. Select the **At each change in** list. *A list of column names is displayed.*	Click **At each change in** ▼
6. Select the name of the column you used to sort the list. *The column name appears in the **At each change in** box.*	Click **Department**
7. Select the **Use function** list. *A list of functions is displayed.*	Click **Use Function** ▼
8. Select the desired function. *The function appears in the **Use function** box.*	Click **Average**
9. Select the first column for which you want to calculate subtotals in the **Add subtotal to** list box. *A tick appears in the check box beside the selected column name.*	Click ☐ **Salary** to select it
10. Select or deselect additional columns, as desired. *The columns are selected or deselected accordingly.*	Click ☐ **Bonus** to select it, if necessary
11. Select or deselect subtotal options, as desired. *The options are selected or deselected accordingly.*	Ensure that the following options are set to the default settings: **Replace current subtotals** - selected **Page break between groups** - deselected **Summary below data** - selected
12. Select **OK**. *The **Subtotal** dialog box closes, subtotals appear in new inserted rows below each group and outlining is applied to the list.*	Click OK

Scroll to the bottom of the list to view the **Grand Average** row. Scroll back to the top of the worksheet.

Practice the concept:

1. Select the **Level 2** outline level button to collapse the outline details.

2. Notice that only the **averages** for each group and the **grand average** are displayed.

3. Click the **Show Detail group level** button next to row 37 to expand the Support group.

4. Redisplay all the details by selecting the **Level 3 outline level** button.

Practice the concept:

1. Click the **Subtotal** button in the **Outline** group and set the following options:

   a. At each change in - Department
   b. Use function - Sum
   c. Add Subtotal to - Salary only (deselect Bonus)
   d. Replace current subtotals - deselect
   e. Page break between groups - deselect

2. Click **OK** to apply the additional subtotals, then scroll the worksheet to view the results.

3. Notice that the outline now has 4 levels.

4. Collapse and expand outline levels as desired to observe the different views available.

5. Click the **Level 4** outline level button to redisplay all levels.
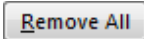
3.2 REMOVING SUBTOTALS FROM A LIST

Steps

Remove subtotals in a list.

1. Select a cell in the list containing the subtotals you want to remove. *The cell is selected.*	Click cell **A3**
2. Select the **DATA** tab. *The DATA tab is displayed.*	Click **DATA**

3. Select the **Subtotal** button in the **Outline** group. *The **Subtotal** dialog box opens.*	Click Subtotal
4. Select the **Remove All** button. *The **Subtotal** dialog box closes and the subtotals and outlining are removed from the list.*	Click [Remove All]

Close **Employees List.xlsx** file.

3.3 SORTING DATA BY MULTIPLE LEVELS

 Steps

Sorting data by multiple levels.

Open **Employees Table.xlsx** file.

1. Select any cell in the table. *The cell is selected.*	Click cell **A4**
2. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
3. Select the **Sort** button in the **Sort & Filter** group. *The **Sort** dialog box opens.*	Click Sort
4. Select the **Column Sort by** list. *A list of table column names are displayed.*	Click **Sort by** ▾
5. Select the name of the column you want to use for the first level of sorting. *The column name appears in the **Sort by** box.*	Click **Department**

6. Select the **Sort On** list. *A list of options is displayed.*	Click **Sort On** ▾
7. Select the desired option. *The selected option appears in the **Sort On** box.*	Click **Values**, if necessary
8. Select the **Order** list. *A list of options is displayed.*	Click **Order** ▾
9. Select the desired option. *The selected option appears in the **Order** box.*	Click **A to Z**, if necessary
10. Select the **Add Level** button. *A new row of options is displayed.*	Click ⁺ᴬ↓ Add Level
11. Select the **Column Then by** list. *A list of table column names is displayed.*	Click **Then by** ▾
12. Select the name of the column you want to use for the second level of sorting. *The column name appears in the **Then by** box.*	Click **Division**
13. Select the **Sort On** list. *A list of options is displayed.*	Click **Sort On** ▾
14. Select the desired option. *The selected option appears in the **Sort On** box.*	Click **Values**, if necessary
15. Select the **Order** list. *A list of options is displayed.*	Click **Order** ▾
16. Select the desired option. *The selected option appears in the **Order** box.*	Click **Largest to Smallest**

17. Add additional levels of sorting as required. *The additional sort levels are displayed in the **Sort** dialog box.*	• Click the **Add Level** button • Select the **Column Then By** list and click **Salary** • Select the **Sort On** list and click **Values**, if necessary • Select the **Order** list and click **Smallest to Largest**
18. Select **OK**. *The **Sort** dialog box closes and the table data is sorted.*	Click OK

Practice the concept:

1. Click the **Sort** button to reopen the **Sort** dialog box.

2. Add another sort level to sort by **Hire Date** sort on **Values** in **Oldest to Newest** order.

3. Notice that the new level is added just after the first level.

4. Use the **Move Down** button at the top of the **Sort** dialog box to move the new sort level to the bottom of the list of levels.

5. Click **OK** to apply the new sort level.

Column		Sort On		Order	
Sort by	Department	Values		A to Z	
Then by	Division	Values		Largest to Smallest	
Then by	Salary	Values		Smallest to Largest	
Then by	Hire Date	Values		Oldest to Newest	
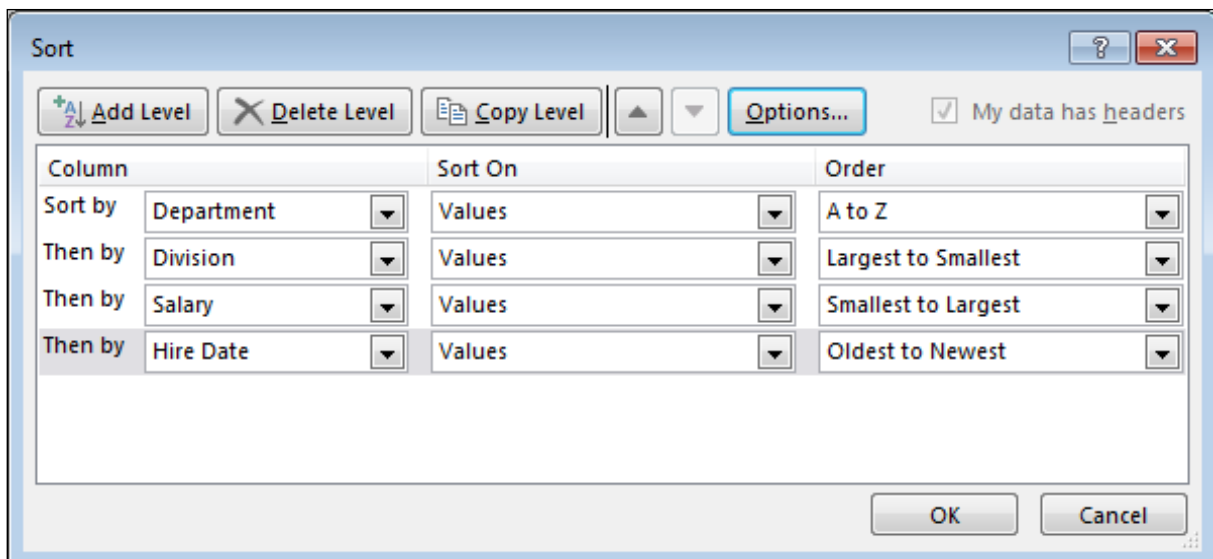
Use the **Undo** button on the **Quick Access Toolbar** to undo all sorting.

3.4 USING CUSTOM SORT

👣 Steps

Use Custom Sort to sort the month.

1. Select any cell in the column you want to sort. *The cell is selected.*	Click cell **E4**
2. Select the **HOME** tab. *The **HOME** tab is displayed.*	Click **HOME**
3. Select the **Sort & Filter** button in the **Editing** group. The options under ***Sort & Filter*** are displayed.	Click [Sort & Filter]
4. Select **Custom Sort** from the list. *The **Sort** dialog box is displayed.*	Click **Custom Sort**
5. Select the field you want to sort by. *The field is selected from the list.*	Select **Hire Month** from the **Sort by** list.
6. Select **Custom List** in the **Order** list. *The **Custom Lists** dialog box appears.*	Select **Custom List** from the **Order** list
7. Select the sequence from the **Custom lists** options. *The sequence is selected.*	Select the **Jan, Feb, Mar,** … sequence
8. Click **OK**. *The dialog box closes, and the sequence appears in the **Order** box.*	Click [OK]
9. Select **OK**. *The **Sort** dialog box closes and the table data is sorted.*	Click [OK]
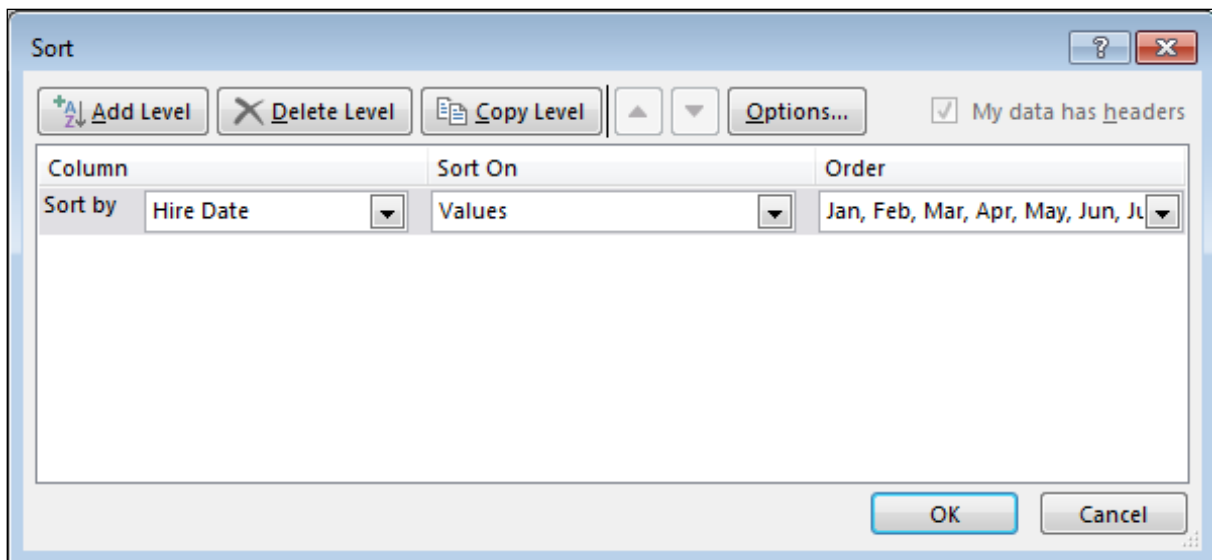
Close **Employee Table.xlsx** file.

3.5 USING DATA VALIDATION

Concepts

Using **Data Validation**, you can define a restriction on what data type and range can or should be entered in a cell. You can also set error messages and instructions to help users correct any errors.
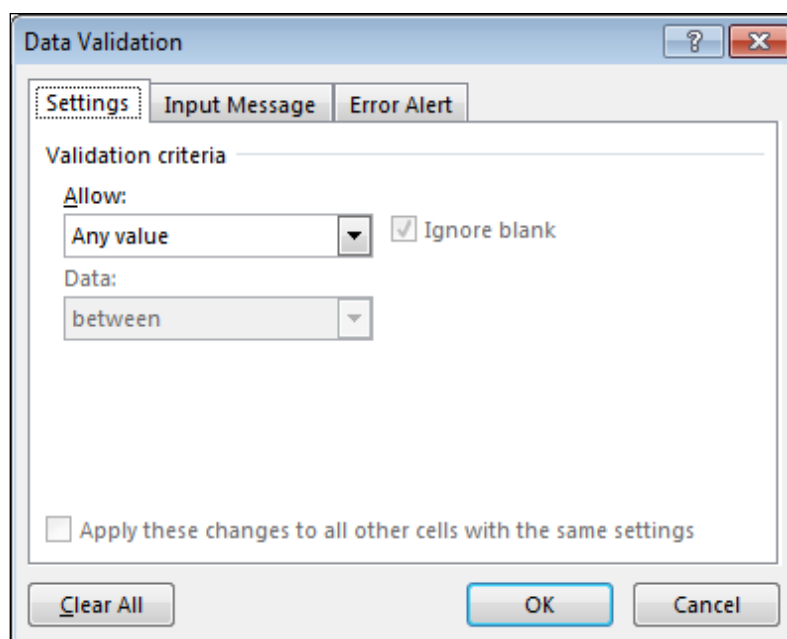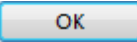
Steps

Use **Data Validation** to restrict data entry.

Open **Data Validation.xlsx** file.

1. Select the column data for which you want to restrict data entry. *The column data is selected.*	Click ⬇ above **Division**
2. Select the **DATA** tab. *The DATA tab is displayed.*	Click **DATA**
3. Select the **Data Validation** button in the **Data Tools** group. *The Data Validation dialog box opens.*	 Click Validation ▾
4. Select the **Settings** tab. *The Settings page is displayed.*	Click **Settings**, if necessary
5. Select the **Allow** list. *A list of options is displayed.*	Click **Allow** ▾
6. Select the desired option. *The desired option appears in the Allow box.*	**Click Whole number**
7. Select the **Data** list. *A list of options is displayed.*	Click **Data** ▾
8. Select the desired option. *The desired option appears in the Data box and one or more boxes (depending on the option selected) appear below the Data box for entering limit values.*	Click **between**
9. Enter the desired limits. *The limits appear in the appropriate boxes.*	• Click in the **Minimum** box and type **2** • Click in the **Maximum** box and type **5**
10. Select or deselect the **Ignore Blank** option, as desired. *The option is selected or deselected accordingly.*	Click ☑ **Ignore Blank** to deselect it

11. Select **OK**.	Click [OK]
*The **Data Validation** dialog box closes and data validation is applied to the selected cells.*	
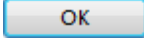
Type **7** in cell **F4** and press [**ENTER**]. A Microsoft Office Excel message box opens, informing you that your entry is not valid. Select **Retry** to close the message box. Type **5** and press [**ENTER**].

3.6 VALIDATING DATA USING A LIST

 Steps

Validate table data using a list.

1. Select the column data for which you want to restrict data entry.	Click ⬇ above **Region**
The column data is selected.	
2. Select the **DATA** tab.	Click **DATA**
*The **DATA** tab is displayed.*	
3. Select the **Data Validation** button in the **Data Tools** group.	
*The **Data Validation** dialog box opens.*	Click [Data Validation ▾]

4. Select the **Settings** tab. *The **Settings** page is displayed.*	Click **Settings**, if necessary
5. Select the **Allow** list. A list of options is displayed.	Click **Allow** ▼
6. Select **List**. *List appears in the **Allow** box and a **Source** box appears.*	Click **List**
7. Click the **Collapse Dialog** button in the **Source** box. *The **Data Validation** dialog box collapses.*	Click 🔣 in the **Source** box
8. Drag to select the list range in the worksheet. A dash marquee appears around the selected range and the address appears in the **Data Validation** dialog box.	Drag to select **J1:J5**, and release the mouse button
9. Click the **Expand Dialog** button in the **Data Validation** dialog box. *The **Data Validation** dialog box expands.*	Click 🔣 in the **Data Validation** dialog box
10. Select or deselect the **Ignore Blank** option, as desired. *The option is selected or deselected accordingly.*	Ensure ☑ **Ignore Blank** is selected
11. Select or deselect the **In-cell dropdown** option, as desired. *The option is selected or deselected accordingly.*	Ensure ☑ **In-cell dropdown** is selected
12. Select **OK**. *The **Data Validation** dialog box closes and data validation is applied to the selected cells.*	Click [OK]
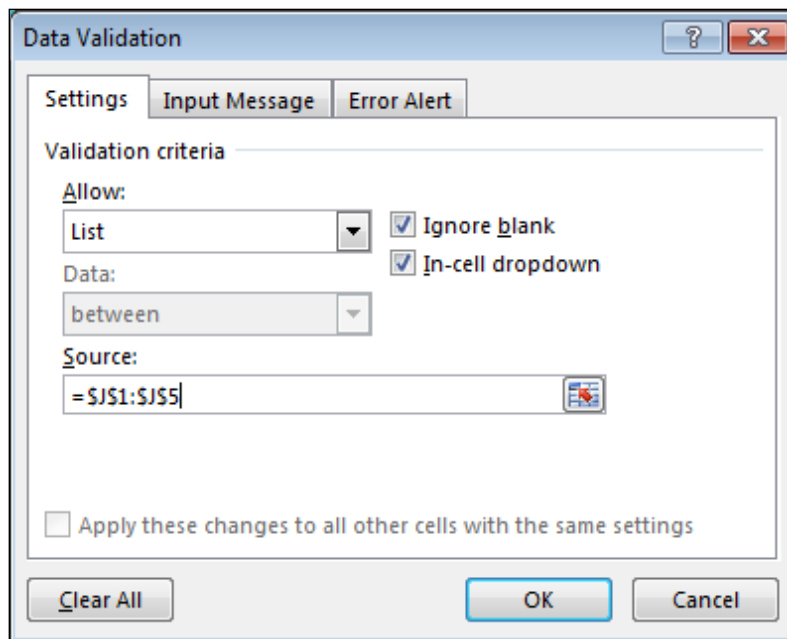
Select cell **E10**. Notice the drop-down arrow that appears to the right of the cell. Click the drop-down arrow and select **South** from the list.
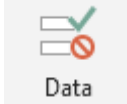
Type **Northwest** into cell **E11** and press [**ENTER**]. A Microsoft Office Excel message box opens, informing you that your entry is not valid. Select **Cancel** to close the message box. Click the drop-down arrow and select **North**.
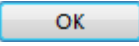
3.7 CREATING A CUSTOM ERROR MESSAGE

 Steps

Create a custom error message.

1.	Select the column data for which you want to customise the error message. *The column data is selected.*	Click above **Division**
2.	Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
3.	Select the **Data Validation** button in the **Data Tools** group. *The **Data Validation** dialog box opens.*	 Click
4.	Select the **Error Alert** tab. *The **Error Alert** page is displayed.*	Click **Error Alert**
5.	Select the **Style** list. *A list of styles is displayed.*	Click **Style**
6.	Select the desired style. *The desired style appears in the **Style** box.*	Click **Warning**
7.	Select the **Title** box. *The insertion point appears in the **Title** box.*	Click in the **Title** box
8.	Type the desired title. *The text appears in the **Title** box.*	Type **Division Error**
9.	Select the **Error message** box. *The insertion point appears in the **Error message** box.*	Click in the **Error message** box

10. Type the desired error message. *The text appears in the **Error message** box.*	Type **Division should be between 2 and 5!**
11. Select **OK**. *The **Data Validation** dialog box closes and the error message is saved.*	Click OK

Type **1** in cell **F4** and press [**ENTER**]. A warning box opens with your custom title and message. Select **Yes** to enter your data despite the warning.
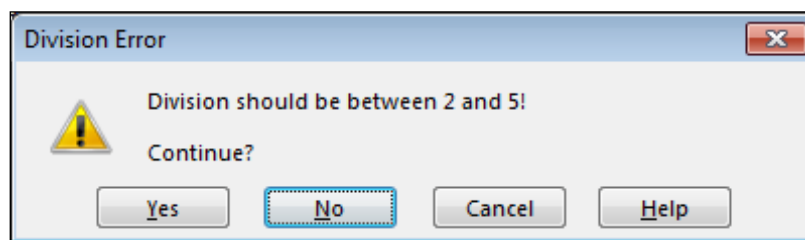
With cell **F4** selected, click on **Data Validation** button in the **Data Tools** group. On the **Error Alert** page, change the **Style** to **Stop**. Change the word **should** in the **Error message** box to **must**. Click the **Settings** tab and select the **Apply these changes to all other cells with the same settings** option. Click **OK**.

Select cell **F5**. Type **1** and press [**ENTER**]. Notice that the error message does not allow you to continue with an incorrect entry. Click the **Cancel** button to close the message. Type **2** in cell **F5**.
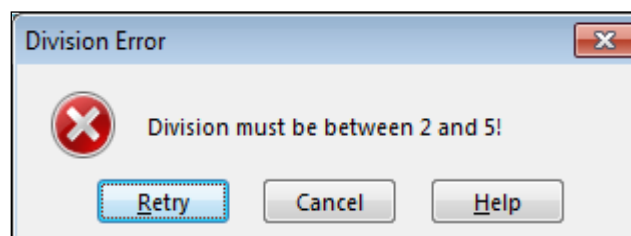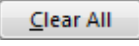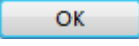
3.8 REMOVING DATA VALIDATION

Steps

Remove data validation.

1. Select the cells with the data validation you want to remove. *The cells are selected.*	Click ⬇ above **Division**
2. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
3. Select the **Data Validation** button in the **Data Tools** group. *The **Data Validation** dialog box opens.*	Click Data Validation ▾
4. Select **Clear All**. *The restrictions are cleared on all pages in the **Data Validation** dialog box*	Click Clear All
5. Select **OK**. *The **Data Validation** dialog box closes and data validation is removed from the selected cells.*	Click OK

Click on any cell to deselect the range.

Close **Data Validation.xlsx** file.

3.9 REVIEW EXERCISE

Using database features

1. Open **Products List.xlsx** file and select the **Products** worksheet.

2. Add data validation to the **ProductID** column to accept only text length of 8 characters.

3. Add a custom input message to the data validation for the **ProductID** column with the title **Product ID** and the message **Enter 8 characters**.

4. Add data validation to the **Category** column using the named range **categories** in column **J**.

5. Add a custom error message to the data validation for the **Category** column using the **Stop** style with the title **Invalid Category** and the message **Select a valid Category from the drop-down list!**.

6. Select a cell in the Category column and test the data validation by typing **books**. Click **Cancel** in the error message box.

7. Select the **SubTotal** worksheet.

8. Sort the list by **Category** in ascending order and then by **Cost Price** in descending order.

9. Apply subtotal to calculate sum of **Cost Price** for each change in **Category**.

10. Collapse the levels so that only the **Category** subtotals and **Grand Total** are visible**.**

11. Expand the details for the **Electronics** subtotal.

12. Close the workbook without saving it.

LESSON 4 -
WORKING WITH ADVANCED FILTERS

In this section, you will learn about:

- Automatically filtering a list in place
- Creating a criteria range
- Using a criteria range
- Showing all records
- Using an advanced AND condition
- Using an advanced OR condition
- Copying filtered records
- Using database functions
- Finding unique records
- Removing duplicates from a table

4.1 AUTOMATICALLY FILTER A LIST IN PLACE
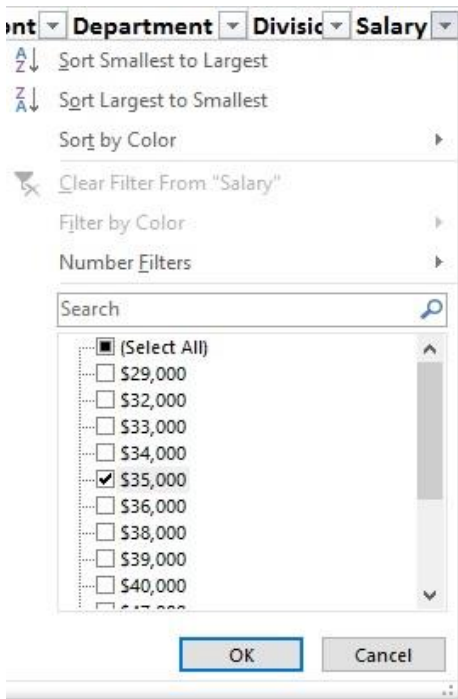
💡 Concepts

An autofilter is used to filter data in its current position on the spreadsheet.

👣 Steps

Create an autofilter.

Open the **Employees List.xlsx** file. Use the autofilter to show only employees with $35,000.

1. Click anywhere within the data range *The column headers are selected.*	Click anywhere within **A8:H8**
2. Click the **Filter** button in the **Sort & Filter** group of the **DATA** tab. *Filter arrows are displayed for each of the column headings within the selected area.*	Click
3. Select the **Salary** filter arrow. From the drop-down filter pane deselect or clear all the tick boxes. Select only the **$35,000** item to filter the data. Click OK.	Click **Salary** filter arrow and select only the **$35,000** item.

Close the **Employees List.xlsx** file.

4.2 CREATING A CRITERIA RANGE

💡 Concepts

The Advanced filter option is used to create and apply an advanced filter to a table. To create an advanced filter a criteria range is needed. This is a range of cells in the worksheet in which selected criteria are entered. The minimum requirement for a criteria range is one column and at least two rows. A criteria range must be situated outside the table or in another worksheet. Very often they are situated a few rows above the table. The first row of a criteria range should have exactly the same labels as used in the table; a good way to ensure this, is to copy the label row from the table and paste it as the first row for the criteria range. It is in the second and subsequent rows of the criteria range that you will enter criteria for the filter. The criteria that you enter will depend on the type of information you require from the table. The table can be considered to be a type of database, as it is used store data in tabular format made up of rows and columns.

To apply the filter, use the Advanced Filter option to select the list range from the table to be filtered and the criteria range to be applied. You can choose to show the filter result on the table or show the filter result in a location of your choosing outside the table.
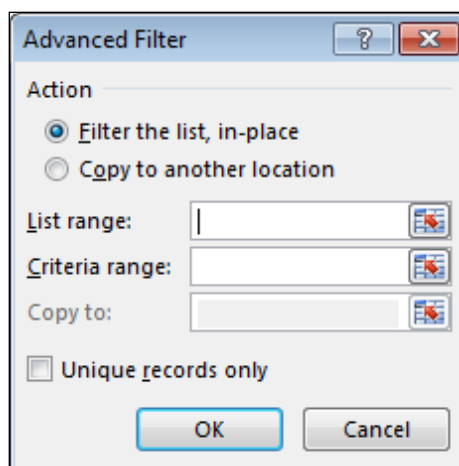
👣 Steps

Create a criteria range.

Open **Employees Filter.xlsx** file.

1. Select the database header row. *The column headers are selected.*	Select **A8:H8**

2. Click the **Copy** button in the **Clipboard** group of the **HOME** tab. *A blinking marquee appears around the copied selection.*	Click ⧉
3. Select the cell where you want to create the criteria range. *The active cell appears in the new location.*	Click cell **A3**
4. Click the **Paste** button in the **Clipboard** group of the **HOME** tab. *The column labels for the criteria range appear in the new location.*	Click Paste

Press [**ESC**] to deselect the copy range. Click in any cell to deselect the paste range.
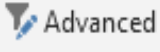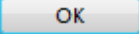
4.3 USING A CRITERIA RANGE

Steps

Use a criteria range to filter a database.

1. Select the cell below the criteria label corresponding to the database column you want to search. *The cell is selected.*	Select **E4**
2. Type the desired criteria. *The criteria appears in the cell.*	Type **sales**
3. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]
4. Select any cell in the database. *The cell is selected.*	Click **A9**

5. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
6. Select the **Advanced** button in **the Sort & Filter** group. *The **Advanced Filter** dialog box opens with the table range selected in the list range box.*	Click Advanced
7. Click the **Collapse Dialog** button in the **Criteria range** box. *The **Advanced Filter** dialog box collapses.*	Click in the **Criteria** range box
8. Select the criteria range. *A dash marquee indicates that the criteria range is selected.*	Select the range **A3:H4**
9. Click the **Expand Dialog** button in the **Advanced Filter - Criteria Range** dialog box. *The **Advanced Filter** dialog box expands.*	Click in the **Advanced Filter - Criteria Range** dialog box
10. Select **OK**. *The **Advanced Filter** dialog box closes and only those records matching the criteria appear.*	Click OK

4.4 SHOWING ALL RECORDS
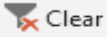
 Steps

Show all rows in a database.

If necessary, create criteria to filter the database.

1. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**

2. Select the **Clear** button in the **Sort & Filter** group. *All rows in the database are displayed.*	Click ![X Clear]

Delete the criteria **sales** in cell **E4**.

4.5 USING AN ADVANCED AND CONDITION

Steps
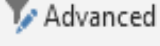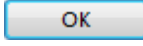
Use an **AND** condition in a criteria range.

Criteria on same rows are joined with an **AND** operator.

Last Name	First Name	Hire Date	Hire Month	Department	Division	Salary	Bonus
				support		<40000	

If necessary, copy the database header row to row **3** and delete any previous criteria in the criteria range. You will use criteria to find employees in the **Support** department earning a salary of below **40000**.

1. Select the cell below the criteria label corresponding to the database column you want to search. *The cell is selected.*	Select **E4**
2. Type the desired criteria. *The criteria appears in the cell.*	Type **support**
3. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]
4. Select the cell below the criteria label corresponding to the second database column you want to search. *The cell is selected.*	Select **G4**
5. Type the desired criteria. *The criteria appears in the cell.*	Type **<40000**

6. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]
7. Select any cell in the database. *The cell is selected.*	Click **A9**
8. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
9. Select the **Advanced** button in **the Sort & Filter** group. *The **Advanced Filter** dialog box opens with the table range selected in the list range box.*	Click ▼ Advanced
10. Click the **Collapse Dialog** button in the **Criteria range** box. *The **Advanced Filter** dialog box collapses.*	Click 🔲 in the **Criteria** range box
11. Select the criteria range. *A dash marquee indicates that the criteria range is selected.*	Select the range **A3:H4**
12. Click the **Expand Dialog** button in the **Advanced Filter - Criteria Range** dialog box. *The **Advanced Filter** dialog box expands.*	Click 🔲 in the **Advanced Filter - Criteria Range** dialog box
13. Select **OK**. *The **Advanced Filter** dialog box closes and only those records matching the criteria appear.*	Click OK

Delete the criteria in the criteria range and show all database records.

4.6 USING AN ADVANCED OR CONDITION

Steps

Use an **OR** condition in a criteria range.
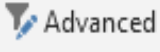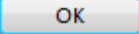
Criteria on different rows are joined with an **OR** operator.

Last Name	First Name	Hire Date	Hire Month	Department	Division	Salary	Bonus
				administration			
						>=50000	

If necessary, copy the database header row to row **3** and delete any previous criteria in the criteria range. You will use criteria to find employees who are either in the **Administration** department or who have a salary greater than or equal to **50000**.

1. Select the cell below the criteria label corresponding to the database column you want to search. *The cell is selected.*	Select **E4**	
2. Type the desired criteria. *The criteria appears in the cell.*	Type **administration**	
3. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]	
4. Select the cell below the criteria label corresponding to the second database column you want to search. *The cell is selected.*	Select **G5**	
5. Type the desired criteria. *The criteria appears in the cell.*	Type **>=50000**	
6. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]	
7. Select any cell in the database. *The cell is selected.*	Click **A9**	

8. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
9. Select the **Advanced** button in **the Sort & Filter** group. *The **Advanced Filter** dialog box opens with the table range selected in the list range box.*	Click Advanced
10. Click the **Collapse Dialog** button in the **Criteria range** box. *The **Advanced Filter** dialog box collapses.*	Click in the **Criteria** range box
11. Select the criteria range. *A dash marquee indicates that the criteria range is selected.*	Select the range **A3:H5**
12. Click the **Expand Dialog** button in the **Advanced Filter - Criteria Range** dialog box. *The **Advanced Filter** dialog box expands.*	Click in the **Advanced Filter - Criteria Range** dialog box
13. Select **OK**. *The **Advanced Filter** dialog box closes and only those records matching the criteria appear.*	Click OK

Practice the concept:

1. Delete the **Salary** criteria.

2. Then, find all employees who are either in the **Administration** department or in the **Support** department.

3. Remove all criteria and show all database records.

4.7 COPYING FILTERED RECORDS
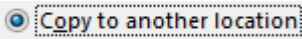
Steps

Copy filtered database rows to another location.

If necessary, copy the database header row to row **3** and delete any previous criteria in the criteria range. You will use criteria to find employees who are not in the **Support** department and paste to row **40**.

1. Select the cell below the criteria label corresponding to the database column you want to search. *The cell is selected.*	Select **E4**
2. Type the desired criteria. *The criteria appears in the cell.*	Type **<>support**
3. Press [**ENTER**]. *The text is entered into the cell.*	Press [**ENTER**]
4. Select any cell in the database. *The cell is selected.*	Click **A9**
5. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
6. Select the **Advanced** button in **the Sort & Filter** group. *The **Advanced Filter** dialog box opens with the table range selected in the list range box.*	Click
7. Click the **Collapse Dialog** button in the **Criteria range** box. *The **Advanced Filter** dialog box collapses.*	Click in the **Criteria** range box
8. Select the criteria range. *A dash marquee indicates that the criteria range is selected.*	Select the range **A3:H4**
9. Click the **Expand Dialog** button in the **Advanced Filter - Criteria Range** dialog box. *The **Advanced Filter** dialog box expands.*	Click in the **Advanced Filter - Criteria Range** dialog box

10. Under **Action**, select the **Copy to another location** option. *The **Copy to another location** option is selected.*	Click ⦿ Copy to another location
11. Select the cell in the upper left corner of the location to which you want to copy the filtered data. *The cell is selected.*	Click **A40**
12. Select **OK**. *The **Advanced Filter** dialog box closes and only those records matching the criteria appear.*	Click [OK]

Scroll as necessary to view the copied data. Then, delete the copied data. Remove all criteria and show all database records.

4.8 USING DATABASE FUNCTIONS

💡 Concepts

Database functions are used to provide calculations based on criteria. For example, from an employee table of all departments, you may want to calculate the salaries of employees just in the support department. Although you can physically filter the data to display the records from the support department and total the found records, you can also use a database function to find the answer without filtering the data.

A database function includes three arguments: database, field, and criteria.

Database: Table or list (including the header row).

Field:Name of the column you want to use in the computation.

Criteria: Cells that define the conditions for the function.

The commonly used database functions are:

DCOUNT	Counts the number of rows with numeric or date values in the designated field for the rows that meet the criteria.
DCOUNTA	Counts the number of rows with non-blank values in the designated

	field for the rows that meet the criteria.
DSUM	Calculates the sum total of the designated field for the rows that meet the criteria.
DAVERAGE	Calculates the numeric average values of the designated field for the rows that meet the criteria.
DMAX	Determines the largest numeric value in designated field for the rows that meet the criteria.
DMIN	Determines the smallest numeric value in designated field for the rows that meet the criteria.
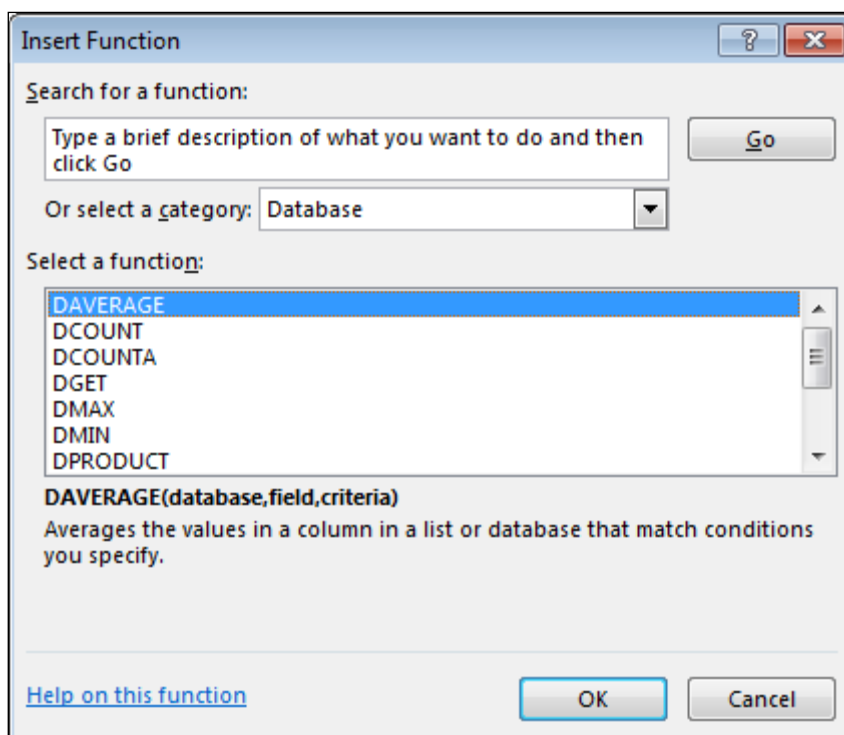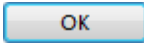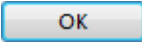
👣 **Steps**

Use a database function.

If necessary, copy the column labels to row **3** and delete any previous criteria in the criteria range. The database range is **A8:H38**. You are going to calculate the average salary for employees hired before 1/1/2000. Type **<1/1/2000** in cell **C4** to enter the criteria.

1. Select the cell where you want the result of the formula to appear. *The cell is selected.*	Click **D6**
2. Click the **Insert Function** button on the **Formula Bar**. *The **Insert Function** dialog box opens.*	Click 𝑓ₓ on the **Formula Bar**

3. Select the **Or select a category** list.	Click **Or select a category** ▾
A list of function categories is displayed.	
4. Select **Database**.	Click **Database**
*A list of all available database functions is displayed in the **Select a function** list box.*	
5. Select the name of the database function to use in the **Select a function** list box.	Click **DAVERAGE**
*The function and its arguments appear at the bottom of the **Insert Function** dialog box.*	
6. Select **OK**.	Click [OK]
*The **Insert Function** dialog box closes and the **Function Arguments** dialog box opens with the insertion point in the **Database** box.*	
7. Select the database range (including the header row).	Select range **A8:H38**
*The database range appears in the **Database** box.*	
8. Select the **Field** box.	Click in the **Field** box
*The insertion point appears in the **Field** box.*	
9. Enter the address or name of the column label of the field you want to use in the formula.	Click **G8** or type **Salary**
*The field reference appears in the formula on the **Formula Bar** (Excel will automatically add quotes around the name).*	
10. Select the **Criteria** box.	Click in the **Criteria** box
*The insertion point appears in the **Criteria** box.*	

11. Enter the address or name of the criteria range. *The range address appears in the formula on the **Formula Bar**.*	Select range **A3:H4**
12. Select **OK**. *The **Function Arguments** box closes and the result of the function appears in the cell.*	Click OK

The correct answer is **$37,667.67**, which represents the average salary for employees hired before **1/1/2000**. Delete the criteria in **C4**. Enter the criteria **4** in **F4**. Notice that the **DAVERAGE** function cell **D6** recalculates.
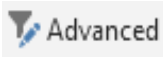
4.9 FINDING UNIQUE RECORDS
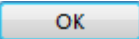
Steps

Find unique records in a database.

Open **Unique.xlsx** file.

1. Select any cell in the database. *The cell is selected.*	Click cell **A4**
2. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
3. Select the **Advanced** button in the **Sort & Filter** group. *The **Advanced Filter** dialog box opens with the table range selected in the list range box.*	Click Advanced
4. Select the **Unique records only** option. *The option is selected.*	Click Unique records only

5. Select **OK**. *The **Advanced Filter** dialog box closes and duplicate records are hidden.*	Click OK
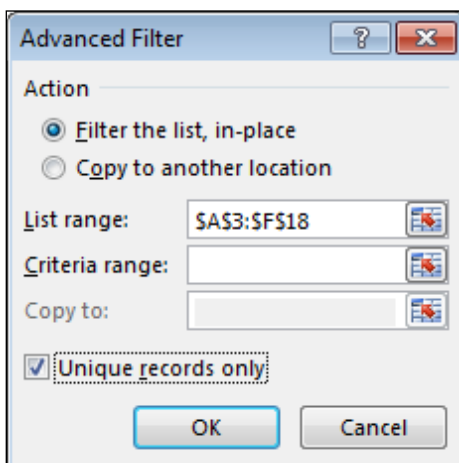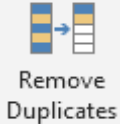
Notice that two apparently duplicate records remain. Click on cells **F5** and **F6** and view the cell entries in the **Formula Bar**. The entries are different, but they appear the same in the cells because the cells are formatted to display zero decimal places. Clear the filter to redisplay all records.
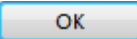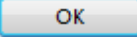
4.10 REMOVING DUPLICATES FROM A TABLE

Steps

Remove duplicates from a table.

1. Select any cell in the table. *The cell is selected.*	Click cell **A4**
2. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
3. Select the **Remove Duplicates** button in the **Data Tools** group. *The **Remove Duplicates** dialog box opens with all columns selected.*	Click Remove Duplicates

4. Select **OK**. *A message box appears informing number of duplicates found and removed and how many unique values remain.*	Click [OK]
5. Select **OK**. *The message box closes.*	Click [OK]

Notice that although two duplicates were removed, one apparent duplicate remains. Click in cells **F5** and **F6** and view the entries in the **Formula Bar**; although they are different, they appear to be the same in the table because the **Salary** column is formatted to show zero decimal places.

Click the **Remove Duplicates** button again. Deselect the **Salary** column in the **Remove Duplicates** dialog box, then click **OK**. One duplicate is removed.
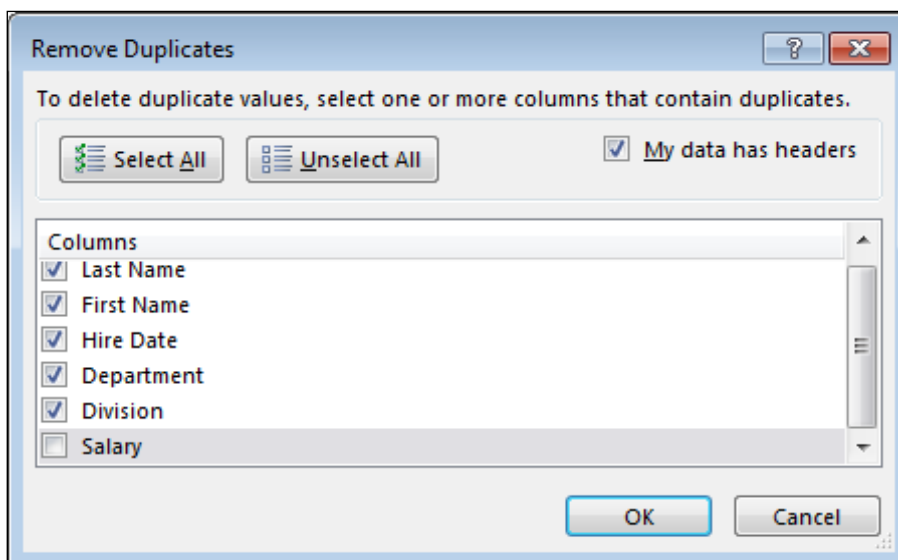
Close **Unique.xlsx** file.

4.11 REVIEW EXERCISE

Working with Advanced Filters

1. Open **Movies.xlsx** file.

2. Create a criteria range by copying the database header row to the first row of the worksheet.

3. Find all movies under the category **Comedy** and **Family** with a rating of below **8.5**.

4. Clear the filter to show all records.

5. Find all movies starting with the word **The**.

6. Clear the filter to show all records.

7. Use the **Advanced Filter** dialog box to copy all movies under the category **Family** that was released after the year **2000** to the cell range beginning in cell **A40**.

8. Use the **DMAX** function in cell **B6** to find the highest rating for a **Comedy** movie.

9. Close the workbook without saving it.

LESSON 5 - CHARTING FEATURES

In this section, you will learn about:

- Creating a combined column and line chart
- Re-position chart title, legend, data labels
- Formatting an axis
- Changing the axis scaling
- Formatting a data series
- Adding data from different worksheets
- Using a secondary axis
- Changing data series chart types
- Changing the source data eange
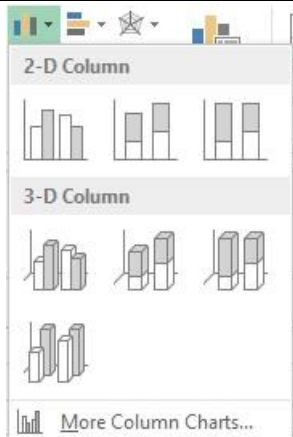
5.1 CREATE A COMBINED COLUMN AND LINE CHART

🔆 Concepts

This is a chart based on two data series that displays a column chart type for one data series and a line chart type for the other series.

👣 Steps

Open **Charting.xlsx** file. If necessary, display the **Combined** sheet.

1. Select the data to be used in the chart.	Select A3:F7
2. Select the INSERT tab *The **INSERT** tab is displayed.*	Click **INSERT**
3. Select the arrow to the right of the **Insert Column Chart** box in the **Charts** group. *A list of Column **Chart types** is displayed.*	
4. Select a chart type	Select **2-D Clustered Column**
5. On the ribbon under **CHART TOOLS**, click the **DESIGN** tab and select **Change Chart type** from the **Type** group	Select
6. In the **Change Chart Type** window, select **Combo**	Select **Combo**

7. Under **Choose the chart type and axis for your data series**: beside series name **Q2,** choose **Line** for chart type and tick the **Secondary Axis box**. Make sure that any other series have a chart type **Clustered Column** and **secondary axis** is not ticked. Click **OK**.	
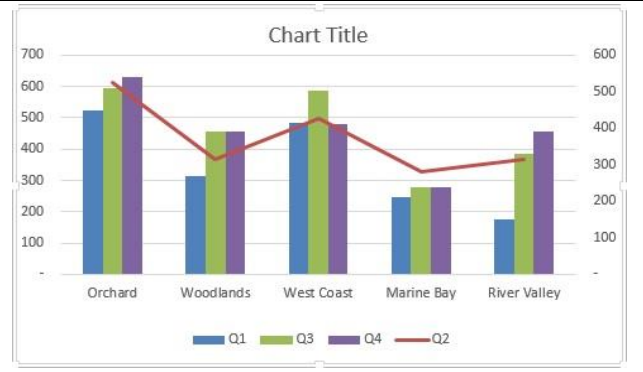
5.2 RE-POSITION CHART TITLE, LEGEND, DATA LABELS

Concepts
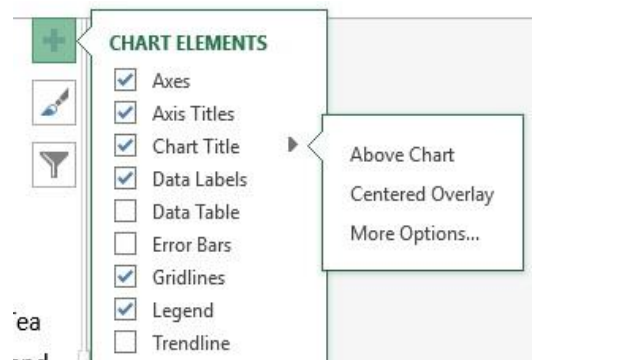
Chart elements like chart title, legend and data labels can be repositioned; that is moved from one position to another position on a chart.
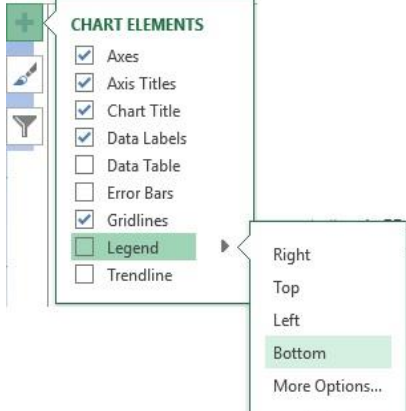
Steps

Open **Charting.xlsx** file. If necessary, display the **Reposition** sheet.
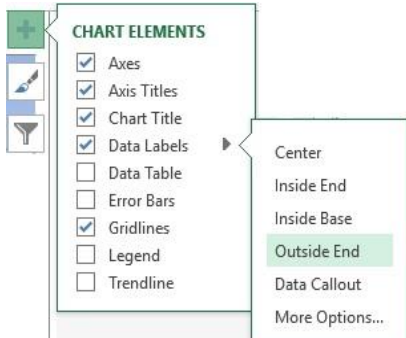
Reposition Chart Title

1. Select the chart title	Click **Regional Sales Performance**
2. Select the **Charts Element** button next to the upper right corner of the chart.	Click **Chart Elements**.
3. Click the Chart Title arrow to display Above Chart, Centered Overlay. Select Above Chart. Note: The position of a chart title can also be changed by dragging the Chart Title around the chart.	

Reposition Legend

1.	Select the legend	Click the **legend** containing Milk Tea, Ice Blend, Fruit Juice, Milk Shake
2.	Select the **Charts Element** button next to the upper right corner of the chart.	Click **Chart Elements**
3.	Click the **Legend** arrow to display Right, Top, Left, Bottom, Select **Bottom.**	

Reposition Data Labels

1.	Select the series Ice Blend, that is the red column.	Click Ice Blend
2.	Select the **Charts Element** button next to the upper right corner of the chart.	Click **Chart Elements**
3.	Click **Data Labels** arrow to display Center, Inside End, Inside Base, Outside End, Data Callout, and click **Outside End.**	

5.3 FORMATTING AN AXIS

Steps

Format an axis.

Open **Charting.xlsx** file. If necessary, display the **Chart1** sheet.

1. Select the chart. *The chart is selected and the **CHART TOOLS** tabs appear on the Ribbon.*	Click on the chart
2. Select the **CHART TOOLS FORMAT** tab. *The **FORMAT** tab is displayed.*	Click **FORMAT**
3. Select the arrow to the right of the Chart Elements box in the Current Selection group. *A list of **Chart Elements** is displayed.*	Click the arrow to the right of the **Chart Elements** box `Chart Area ▼`
4. Select the chart element you want to format. *The element is selected and the name of the selected element appears in the **Chart Elements** box.*	Click **Vertical (Value) Axis**
5. Select the Format Selection button in the Current Selection group. *The Format Axis pane opens.*	Click ⚙ Format Selection
6. Select the desired formatting component from the list in the pane. *The options for the component are displayed in the pane.*	Click **NUMBER**
7. Select the desired options. *The desired options are applied to the chart element as you select them.*	• Select **Currency** from the **Category** list • Change the number of decimal places to **0** and select the dollar sign (**$**) from the **Symbol** list, if necessary • Select **TICK MARKS** options in the pane • Click the **Minor** tick mark type list and select **Outside**
8. Select Close icon. *The Format Axis pane closes.*	Click ✕

Original vertical axis   Formatted vertical axis
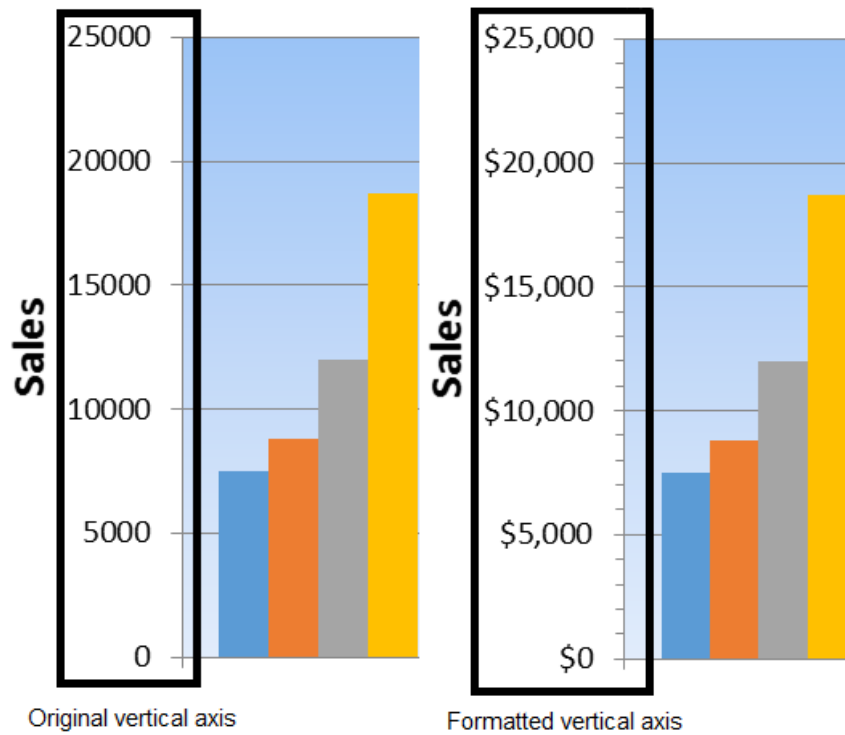
5.4 CHANGING THE AXIS SCALING

![Steps icon] **Steps**

Change the axis scaling.

If necessary, display the **Chart1** sheet.

1. Select the chart. *The chart is selected and the **CHART TOOLS** tabs appear on the **Ribbon**.*	Click on the chart
2. Select the **CHART TOOLS FORMAT** tab. *The **FORMAT** tab is displayed.*	Click **FORMAT**
3. Select the arrow to the right of the **Chart Elements** box in the **Current Selection** group. *A list of **Chart Elements** is displayed.*	Click the arrow to the right of the **Chart Elements** box `Chart Area ▾`

4. Select the chart element you want to format. *The element is selected and the name of the selected element appears in the **Chart Elements** box.*	Click **Vertical (Value) Axis**
5. Select the **Format Selection** button in the **Current Selection** group. *The **Format Axis** pane opens.*	Click ⚙ Format Selection
6. Select the desired formatting component from the list in the pane. *The options for the component are displayed in the pane.*	Click **Axis Options**, if necessary
7. Select the desired scaling option and apply the new value. *The desired options is selected.*	For the **Maximum** option, type **20000**
8. Continue changing the axis scale values as desired. *The axis scale values change accordingly.*	• Set the **Major** unit value to **4000** • Select **Thousands** for the **Display units** option so that Excel truncates the zeros
9. Select **Close** icon. *The **Format Axis** pane closes.*	Click ✕

Original axis scale   Formatted axis scale
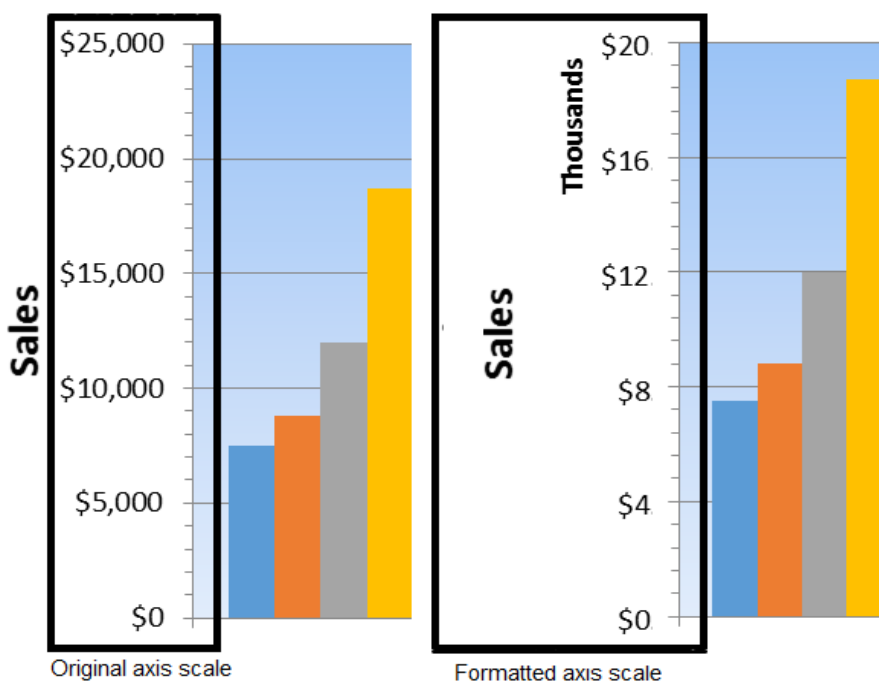
5.5 FORMATTING THE DATA SERIES

Steps

Format the data series in a chart.

If necessary, display the **Chart1** sheet.

1. Select the chart. *The chart is selected and the CHART TOOLS tabs appear on the Ribbon.*	Click on the chart
2. Select the **CHART TOOLS FORMAT** tab. *The FORMAT tab is displayed.*	Click **FORMAT**
3. Select the arrow to the right of the **Chart Elements** box in the **Current Selection** group. *A list of Chart Elements is displayed.*	Click the arrow to the right of the **Chart Elements** box Chart Area ▾
4. Select the data series you want to format. *The series is selected and the name of the selected series appears in the Chart Elements box.*	Click **Series "Milk Shake"**
5. Select the **Format Selection** button in the **Current Selection** group. *The Format Data Series pane opens.*	Click Format Selection
6. Select the desired formatting component from the list in the pane. *The options for the component are displayed in the pane.*	Click **Fill and Line**
7. Select the desired option in the panel. *The desired options are applies to the data series as you select them.*	• Click on **FILL** in the pane if necessary • Select **Picture or texture fill** • Click on **File**, browse to the **Student Folder** and select the image **milkshake** • Click **Insert** • Choose the **Stack** option

8. Select **Close** icon. *The **Format Data Series** pane closes.*	Click ✕

Practice the concept:

1. In the **DESIGN** tab, select the **Add Chart Element** button in the Chart Layouts group, and choose **Data Labels** and **Outside End** from the menu that opens.

2. Click on one of the labels that appear above each bar in the series.

3. Notice that the **Chart Elements** box in the **FORMAT** tab shows that **Series "Milk Shake" Data Labels** has been selected.

4. Click **Format Selection** to open the **Format Data Labels** pane.

5. In the **LABEL OPTIONS** section, click **Category Name** and set the **Separator** to **(New Line)**, then close the pane.

5.6 ADDING DATA FROM DIFFERENT WORKSHEETS

Steps

Add a data series from a different worksheet.

Display the **Coupons** sheet.

1. Select the data you want to add to the chart as a new series. *The range is selected.*	Select **A8:F8**
2. Click the **Copy** button in the **Clipboard** group on the **HOME** tab. *The range is copied to the **Clipboard**.*	Click
3. Display the sheet containing the chart. *The sheet is displayed.*	Click the **Chart1** sheet tab
4. Select the chart. *The chart is activated and the **CHART TOOLS** tabs appear on the **Ribbon**.*	Click anywhere in the chart area
5. Click the **Paste** button in the **Clipboard** group on the **HOME** tab. *The new series appears in the chart and in the legend.*	Click Paste

Notice that the new series is barely visible in the chart; the fixed scale on the **Vertical (Value)** Axis is not appropriate for the data in the new series.

5.7 USING A SECONDARY AXIS

Steps

Use a secondary axis.

If necessary, display the **Chart1** sheet. The values in the **Total Coupons** data series are so small that it is almost unreadable. Also, the **Vertical (Value) Axis** scale in thousands of dollars is not suitable for the **Total Coupons** data series. A secondary axis is needed to provide a different scale.

1. Select the chart. *The chart is selected and the **CHART TOOLS** tabs appear on the **Ribbon**.*	Click on the chart
2. Select the **CHART TOOLS FORMAT** tab. *The **FORMAT** tab is displayed.*	Click **FORMAT**
3. Select the arrow to the right of the **Chart Elements** box in the **Current Selection** group. *A list of **Chart Elements** is displayed.*	Click the arrow to the right of the **Chart Elements** box <kbd>Chart Area ▾</kbd>
4. Select the data series you want to chart against the secondary axis. *The series is selected and the name of the selected series appears in the **Chart Elements** box.*	Click **Series "Total Coupons"**
5. Select the **Format Selection** button in the **Current Selection** group. *The **Format Data Series** pane opens.*	Click 🖌 Format Selection
6. Select **SERIES OPTIONS** in the pane. *The options for the component are displayed in the right-hand pane.*	Click **SERIES OPTIONS**, if necessary
7. Select the **Secondary Axis** option under **Plot Series On**. *The **Secondary Axis** option is selected.*	Click ○ Secondary Axis
8. Select **Close** icon. *The **Format Data Series** pane closes, the data series is plotted against the secondary axis and the secondary axis scale appears on the right of the plot area.*	Click ✕
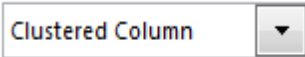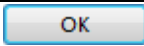
Click in a blank area of the chart to deselect the series. Notice that the data series plotted against the secondary axis overlays the data series plotted against the primary axis. The secondary axis series needs to be plotted as a different chart type.

5.8 CHANGING DATA SERIES CHART TYPES

Steps

Change a data series chart type.

If necessary, display the **Chart1** sheet. The **Total Coupons** data series plotted against the secondary axis overlays the data series plotted against the primary axis. The secondary axis series needs to be plotted as a different chart type.

1. Right-click the data series you want to change. *A shortcut menu opens.*	Right-click one of the columns in the **Total Coupons** data series
2. Select **Change Series Chart Type** from the shortcut menu. *The **Change Chart Type** dialog box opens.*	Click **Change Series Chart Type**
3. Select the general chart type you want to use from the list in the left-hand pane of the dialog box. *The general chart type is selected and the right-hand pane scrolls, as necessary, to the selected part of the gallery.*	Click **Combo**
4. Select the specific chart type you want to use for the specific series **Chart Type** drop down list. *The specific chart type is selected.*	Click **Total Coupons** series **Chart Type** drop down list Clustered Column ▼ and choose **Line with Markers** (fourth option in the **Line** section)
5. Select **OK**. *The **Change Chart Type** dialog box closes and the selected data series changes to the new chart type.*	Click OK

Practice the concept:

1. Click the **CHART TOOLS FORMAT** tab and select Series "**Total Coupons**" from the **Chart Elements** list in the **Current Selection** group.

2. Click the **Format Selection** button to open the **Format Data Series** pane and select **Fill & Line**.

3. Click on **MARKER**, under **MARKER OPTIONS**, click **Built-in**, then click the **Type** list and change the style of the marker to a diamond.

4. Use the **Size** spin box to increase the size to **15**.

5. Select **Fill** and select the **Solid fill** option.

6. Click the **Fill Color** drop down list button and select **Dark Blue**, (second option from right, under **Standard Colors**).

7. Close the **Format Data Series** pane and click in a blank area to deselect the data series.
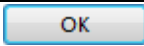
5.9 CHANGING SOURCE DATA RANGE

🔆 Concepts

You can use the **Select Source Data** feature to add or delete a data series in a chart. To add a data series, select the chart and click **Select Data** from the ribbon to open the **Select Data Source** dialog box. Click the **Add** button under **Legend Entries (series)**. Enter the series name and select the series values from the data source that you wish to display in the chart. The chart will preview any changes and selections you make in the **Select Data Source** dialog box before you click OK.

👣 Steps

Display the **Coupons** sheet. If necessary, select the chart. If necessary, switch row/column so that the row data is plotted on the x-axis.

1. Select the **CHART TOOLS DESIGN** tab. *The **DESIGN** tab is displayed.*	Click **DESIGN**
2. Select the **Select Data** button in the **Data** group. *The **Select Data Source** dialog box opens.*	Click Select Data
3. Uncheck the data series you want to remove from the **Legend Entries (Series)** list box. *The data series is unchecked.*	Uncheck the option **Woodlands**
4. Select the **OK** button. *The Select Data **Source** dialog box closes, and the data source in the chart is modified accordingly.*	Click OK

Close **Charting.xlsx** file.

5.10 REVIEW EXERCISE

Modify chart options

1. Open **Tour Agency.xlsx** file.

2. Change the scale for the **Value Axis** to display **Major Units** at intervals of **10** and **Minor Units** at intervals of **2**.

3. Change the number format for the **Value Axis** to **Currency** using a dollar sign and no decimal places.

4. Add the **Vertical Axis Title** "**in millions**" and format the font size to **12**.

5. Display the **Legend** on the right.

6. Change the fill color of the **Total Tour Sales** data series to **Purple** using the **Standard Colors**.

7. Select the **Inbound Tours** data series and plot it against the **Secondary Axis**.

8. Change the **Chart Type** for the **Inbound Tours** data series to **Line with Markers**.

9. Format the **Secondary Axis** as following:

    - Set the **Font Size** to **12**.
    - Change the number format to **Currency** using a dollar sign and no decimals places.
    - Change the scale of the **Major Units** to **1** and **Minor Units** to **0.2**.

10. Enter the value **13.51** in **F22** and **7.08** in **F23**.

11. Copy the entered values including the column heading (**F21:F23**) and paste them into the chart starting from **G19**.

12. Delete the **Expenses** data series.

13. Set the position of the **Data Labels** to display at the **Outside End** for the chart starting at **G35**.

14. Set the fill of the data series with the image "**suitcase**".

15. Close the workbook without saving it.

LESSON 6 - CREATING/REVISING PIVOTTABLES

In this section, you will learn about:

- Creating a PivotTable report
- Adding PivotTable report fields
- Selecting a report filter item
- Refreshing a PivotTable report
- Changing the summary function
- Adding new fields to a PivotTable report
- Moving PivotTable report fields
- Hiding/unhiding PivotTable report items
- Deleting PivotTable report fields
- Creating report filter pages
- Formatting a PivotTable report
- Creating a PivotChart report
- Grouping Data Manually

6.1 CREATING A PIVOTTABLE REPORT

Concepts

A PivotTable is used to organise and summarise large amounts of data by categories and sub-categories into easy to read tables for reporting and analysis. In the PivotTable you can expand and collapse levels of data or drill down for further details. You can create custom calculations and formulas, such as running total in, % of Total. You can subtotal and total fields and aggregate numeric data to collapse, summarise or group the data.

To see different summaries of the source data you can pivot by moving rows to columns and columns to rows.

Before creating a PivotTable, understanding the way the data will be organised helps you to make the best decisions about how much data to use and how to organise it.

Data suitable for use in a PivotTables must have these characteristics:

- The top row of the data table must contain column headers.

- Each row of the data table must contain a record about a specific entity or transaction.

- Each column of the data table must have the same kind of information.

- The data table must not have any blank rows.

- The data table must not have any blank columns.

- Columns that contain numbers must use a zero instead of leaving a cell blank if a value is not available.

Steps

Create a PivotTable report.

Open **Employees Pivot.xlsx** file.

1. Select a cell containing data in the worksheet. *The cell is selected.*	Click **A4**

2. Select the **INSERT** tab. *The INSERT tab is displayed.*	Click **INSERT**
3. Select the **PivotTable** button in the **Tables** group. *The Create PivotTable dialog box opens and the data range is selected on the worksheet.*	Click PivotTable
4. Select where you want the **PivotTable** report to appear. *The option is selected.*	Click ⊙ New Worksheet , if necessary
5. Select **OK**. *The Create PivotTable dialog box closes. A new worksheet is displayed and the PivotTable Field List pane opens. The PivotTable Tools contextual Options and Design tabs are displayed on the Ribbon.*	Click OK

6.2 ADDING PIVOTTABLE REPORT FIELDS

Concepts

The PivotTable Fields List pane is displayed after the PivotTable is created and is used to add and arrange fields in the PivotTable. The field section of the pane is used to pick which fields to display in the PivotTable and the areas section of the pane is used to arrange the fields in the PivotTable.

The areas section of the PivotTable Fields List pane show the following sections into which fields will be placed as you select them from the field section. You can drag a field from one area to another to change how it is displayed in the PivotTable.

Filters: Fields that are placed here are displayed as top level report filters located above the PivotTable.

Columns: Usually Fields that are placed here are displayed as column labels located at the top of the PivotTable.

Rows:Usually non-numeric fields are placed here and displayed as row labels located on the left side of the PivotTable.

Values:Usually numeric fields are placed here and displayed as summarised numeric values in the PivotTable.

Steps

Add fields to a PivotTable report.

1. Select the desired field name from the field section in the **PivotTable Field List** pane and drag to the **ROWS** box in the layout section. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired location in the layout section.*	Drag the **Department** field to the **ROWS** box
2. Release the mouse button. *The selected field name is displayed in the **ROWS** box in the layout section, and a list of the field's data values is displayed in the PivotTable report worksheet.*	Release the mouse button

3. If necessary, select the next desired field name from the field section in the **PivotTable Field List** pane and drag to the **ROWS** box in the layout section. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired location in the layout section.*	Drag the **Gender** field to the **ROWS** box
4. Release the mouse button. *The selected field name is displayed in the **ROWS** box in the layout section, and a list of the field's data values is displayed in the PivotTable report worksheet.*	Release the mouse button
5. Select the desired field name from the field section in the **PivotTable Field List** pane and drag to the **COLUMNS** box in the layout section. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired location in the layout section.*	Drag the **Division** field to the **COLUMNS** box
6. Release the mouse button. *The selected field name is displayed in the **COLUMNS** box in the layout section, and column labels are displayed, along with a **Grand Total** column and row, in the PivotTable report worksheet.*	Release the mouse button
7. Select the desired field name from the field section in the **PivotTable Field List** pane and drag to the **VALUES** box in the layout section. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired location in the layout section.*	Drag the **Salary** field to the **VALUES** box

8. Release the mouse button. *The selected field name is displayed in the **VALUES** box in the layout section. The field's data values, along with **Grand Total** values, are displayed in the PivotTable report worksheet.*	Release the mouse button

▼ FILTERS	||| COLUMNS
	Division ▼

≡ ROWS	Σ VALUES
Department ▼	Sum of Salary ▼
Gender ▼	
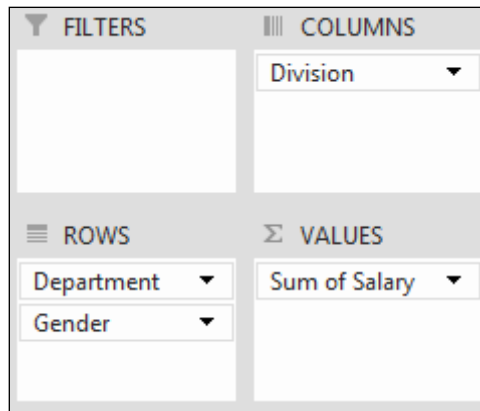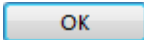
Sum of Salary	Column Labels ▼				
Row Labels ▼	2	3	4	5	Grand Total
⊟ Administration	143000	117000	60000	65000	385000
Female	51000	55000	60000	65000	231000
Male	92000	62000			154000
⊟ New Tech	392000		122000	72000	586000
Female	117000			72000	189000
Male	275000		122000		397000
⊟ Sales	455000	174000	226000	69000	924000
Female	207000		190000	34000	431000
Male	248000	174000	36000	35000	493000
⊟ Support	310000	190000	61000	92000	653000
Female	156000	130000	29000	92000	407000
Male	154000	60000	32000		246000
Grand Total	1300000	481000	469000	298000	2548000

6.3 SELECTING A REPORT FILTER ITEM

Steps

Select a report filter field item.

1. Select the desired field name from the field section in the **PivotTable Field List** pane and drag to the **FILTERS** box in the layout section. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired location in the layout section.*	Drag the **Level** field to the **FILTERS** box
2. Release the mouse button. *The selected field name is displayed in the **FILTERS** box in the layout section, and the field name is displayed in the PivotTable report worksheet.*	Release the mouse button
3. Click the report filter field list. *A list of available field values is displayed.*	Click ▼ in cell **B1**
4. Select the desired item. *The item is selected.*	Click **Management**
5. Select **OK**. *Only the data for the selected item appears in the PivotTable report.*	Click OK

▼ FILTERS	IIII COLUMNS
Level ▼	Division ▼

≡ ROWS	Σ VALUES
Department ▼	Sum of Salary ▼
Gender ▼	
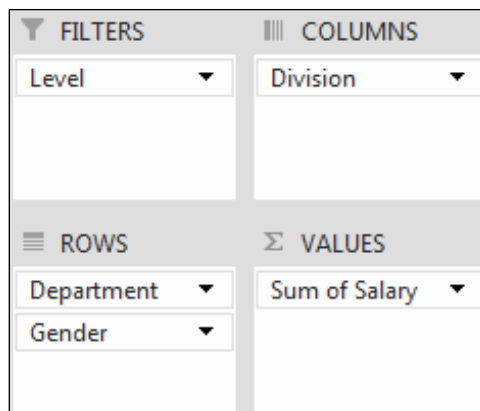
Notice that only the data for the selected level **Management** is displayed.

Level	Management				
Sum of Salary	**Column Labels**				
Row Labels	**2**	**3**	**4**	**5**	**Grand Total**
⊟ **Administration**	**110000**	**55000**	**60000**	**65000**	**290000**
Female	51000	55000	60000	65000	231000
Male	59000				59000
⊟ **New Tech**	**105000**		**52000**	**72000**	**229000**
Female				72000	72000
Male	105000		52000		157000
⊟ **Sales**	**251000**	**113000**	**125000**		**489000**
Female	112000		125000		237000
Male	139000	113000			252000
⊟ **Support**	**108000**	**110000**			**218000**
Female	50000	50000			100000
Male	58000	60000			118000
Grand Total	**574000**	**278000**	**237000**	**137000**	**1226000**

6.4 REFRESHING A PIVOTTABLE REPORT

Steps

Refresh a PivotTable report.

If necessary, display the **Sheet1** worksheet and select **Management** from the **Level** report filter field. Display the **List** worksheet. Change the number in cell **H9** from **60000** to **62000**. Then, display the **Sheet1** worksheet again. Notice that the number **60000** still appears in the **Administration**, **Female** field for **Division 4**.

1. Right-click any cell in a PivotTable report to display a shortcut menu. *The **PivotTable** shortcut menu opens.*	Right-click cell **A3**
2. Select the **Refresh** command. *The PivotTable report updates.*	Click **Refresh**

Display the data for all the levels by selecting **(All)** for the **Level** report filter field. Notice the change to the data displayed.

6.5 CHANGING THE SUMMARY FUNCTION

Steps

Change the summary function for a value field.

1. Right-click any cell in a PivotTable report to display a shortcut menu. *The **PivotTable** shortcut menu opens.*	Right-click cell **B5**
2. Select the **Value Field Settings** command. *The **Value Field Settings** dialog box opens.*	Click **Value Field Settings**
3. Select the desired summary function from the **Summarize value field by** list box. *The summary function is selected.*	Click **Count**
4. Select **OK**. *The **Value Field Settings** dialog box closes, and the PivotTable report is summarised accordingly.*	Click [OK]

Level	(All)				
Count of Salary	Column Labels				
Row Labels	2	3	4	5	Grand Total
⊟ Administration	3	3	1	1	8
Female	1	1	1	1	4
Male	2	2			4
⊟ New Tech	10		3	1	14
Female	3			1	4
Male	7		3		10
⊟ Sales	10	4	5	2	21
Female	5		4	1	10
Male	5	4	1	1	11
⊟ Support	8	4	2	3	17
Female	4	3	1	3	11
Male	4	1	1		6
Grand Total	31	11	11	7	60

Practice the concept:

- Reset the summary function for the **Salary** field to **Sum**.

6.6 ADDING NEW FIELDS TO A PIVOTTABLE REPORT

Steps

Add a field to a PivotTable report.

If necessary, display the **Sheet1** worksheet and click in the PivotTable report to open the **PivotTable Field List** pane.

1. Drag the field you want to add to the PivotTable report from the top section of the **PivotTable Field List** pane to the desired section in the layout area at the bottom of the pane. *The field is added to the appropriate section of the **PivotTable Field List** pane, and to the PivotTable report.*	Drag the **Bonus** field to a position below the **Sum of Salary** field in the **VALUES** section
2. Release the mouse button. *The selected field name is displayed in the appropriate box in the layout section, and the field name is displayed in the PivotTable report worksheet.*	Release the mouse button

You can now easily see total salary and bonus for each department's male and female staff.

Practice the concept:

1. Remove the **Sum of Bonus** field from the report by dragging it from the **VALUES** section into the area at the top of the PivotTable Field List pane.

2. Remove the **Gender** field from the report by dragging it from the **ROWS** section into the area at the top of the **PivotTable Field List** pane.

3. Add the **Emp ID** field to the **VALUES** area by dragging the **Emp ID** field below the **Sum of Salary** field.

6.7 MOVING PIVOTTABLE REPORT FIELDS

Steps

Move a PivotTable report field.

1. Select the desired field name from the relevant area in the lower half of the **PivotTable Field List** pane and drag to the required area. *The selected field name is highlighted and the mouse pointer changes to a move handle. The field name label appears as you drag to the desired area.*	Drag the **Division** field to a position below the **Department** field in the **ROWS** box
2. Release the mouse button. *The desired field is displayed in the required target area in the layout section, and the PivotTable report is updated appropriately on the worksheet.*	Release the mouse button

Notice that the **Division** field now appears as a sub of the **Department** field.

Practice the concept:

1. Drag the **Division** field above the **Department** field to arrange the data first by division and then by department.

2. Close **Employees Pivot.xlsx** file.
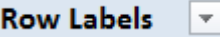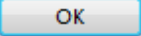
6.8 HIDING/UNHIDING/SORTING PIVOTTABLE REPORT ITEMS

Steps

Hide and unhide items in a PivotTable report.

Open **Trips Pivot.xlsx** file. Display the **Sheet1** worksheet.

1. Select the **Row Labels** or **Column Labels** list containing the items you want to hide or unhide. *The list of available items is displayed in the lower pane.*	Click **Row Labels** ▾
2. Deselect the item you want to hide, or select the item you want to unhide. *The item is deselected or selected.*	Click ☑ Edina to deselect it
3. Continue deselecting or selecting items as desired. *The items are deselected or selected.*	Click ☑ Maplewood to deselect it
4. Select **OK**. *The list of available items closes and the fields are hidden or unhidden in the PivotTable report.*	Click OK

Notice that **Edina** and **Maplewood** no longer appear in the PivotTable report.

Practice the concept:

Unhide the data in the Office item list by selecting (Select All).

You can also sort data ascending or descending order:

1. Select the **Row Labels** or **Column Labels** list containing the items you want to hide or unhide.

2. To sort data in ascending, click click **Sort A to Z**; to sort data in descending order, click **Sort Z to A**.

6.9 DELETING PIVOTTABLE REPORT FIELDS

👣 Steps

Delete a PivotTable report field.

1. In the **PivotTable Field List** pane, uncheck the box of the field you want to remove. *The field is removed from the PivotTable report.*	Click ☑ Tickets to deselect it

6.10 CREATING REPORT FILTER PAGES

👣 Steps

Create Report Filter Pages.

Drag the **Date** field from the **PivotTable Field List** pane to a position above the **Commission** field in the **FILTERS** box.

1. Select the **PIVOTTABLE TOOLS** contextual **ANALYZE** tab. *The OPTIONS tab is displayed.*	Click **ANALYZE**
2. Select the drop down list on the **Options** button in the **PivotTable** group. *The Options menu opens.*	Click 📇 Options ▾
3. Select the **Show Report Filter Pages** command. *The Show Report Filter Pages dialog box opens.*	Click 🗐 Show Report Filter Pages...
4. Select the report filter field for which you want to create report filter pages. *The report filter field is selected.*	Click **Commission**
5. Select **OK**. *The Show Report Filter Pages dialog box closes, and a report filter field report is created for each item in the report filter field.*	Click OK

View each of the report filter field reports. Display the **Sheet1** worksheet. Double-click the detail item in cell **B9**; a new worksheet is inserted to display the data item details in a table.

6.11 FORMATTING A PIVOTTABLE REPORT

👣 Steps

Format a **PivotTable report** using **PivotTable Styles**.

If necessary, display the **Sheet1** worksheet. Click anywhere in the PivotTable report to activate it.

1. Select the **PIVOTTABLE TOOLS** contextual **DESIGN** tab. *The DESIGN tab is displayed.*	Click **DESIGN**
2. Select the **More** button in the **PivotTable Styles** group. *The PivotTable Styles gallery opens.*	Click **PivotTable Styles** ⊟
3. Select the desired style. *The PivotTable Styles gallery closes and the style is applied to the PivotTable report.*	Scroll as necessary and click **Pivot Style Medium 13**

Commission	(All) ▼			
Sum of Total	**Column Labels** ⧩			
Row Labels ⧩	**Bayland Services**	**Dallas Vet**	**LA Port Services**	**Grand Total**
Bloomington	400	380		780
Brooklyn Center	400			400
Minneapolis	1410	1250		2660
Rochester	500	190		690
Two Harbors			900	900
Grand Total	**2710**	**1820**	**900**	**5430**
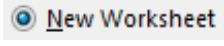
6.12 CREATING A PIVOTCHART REPORT

👣 Steps

Create a PivotChart report.

Display the **Ticket Sales** worksheet.

1. Select any cell in the list/database. *The active cell moves accordingly.*	Click **A2**
2. Select the **INSERT** tab. *The INSERT tab is displayed.*	Click **INSERT**
3. Select the **PivotChart** button in the **Charts** group. *The **Create PivotChart** dialog box opens.*	Click PivotChart
4. Select the required location of the PivotTable and PivotChart. *The option is selected.*	Click ⦿ New Worksheet , if necessary
5. Drag the desired fields from the top half of the **PivotTable Field List** pane to the required area of the lower half of the pane. *The field appears in the required area.*	Drag **Office** to the **AXIS (CATEGORIES)** box
6. Repeat step 5 as required for the fields to be shown on the PivotChart. *The fields are shown in their respective areas in the lower section of the **PivotTable Field List** pane, and the PivotChart is created.*	• Drag the **Total** field to the **VALUES** box • Drag the **Commission** field to the **LEGEND (SERIES)** box
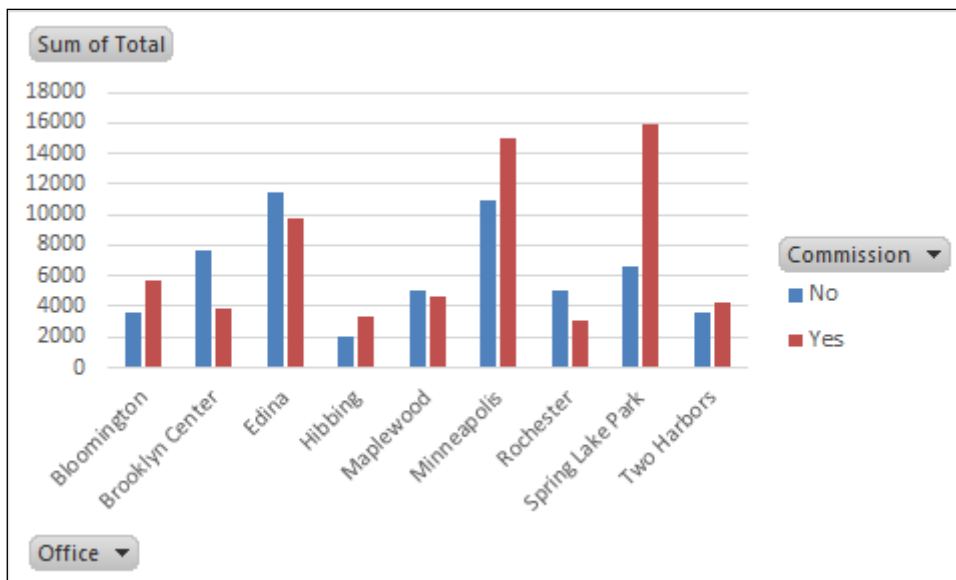
Close **Trip Sales.xlsx** file.

6.13 GROUPING DATA MANUALLY

💡 Concepts

Besides using the groups given by PivotTable, you can create your group data manually. For example, you can group Quarter 1 and Quarter 2 data to be displayed under one group.
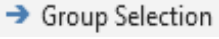
👣 Steps

Group PivotTable fields.

Open **Pivot Group.xlsx** file. Display the **Sheet1** worksheet.

1. Select the range of cells you want to group. *The specified cells are selected.*	Select cells **A4:A19**
2. Select the **ANALYZE** tab in the **PIVOTTABLE TOOLS** contextual tab. *The ANALYZE tab is displayed.*	Click **ANALYZE**

3. Select the **Group Selection** button in the **Group** group. *The selected cells are grouped.*	Click → Group Selection
4. Select the heading of the new group. *The group heading is selected.*	Click **A4**
5. Type the name for the group and press [**ENTER**]. *The group is renamed.*	Type **Quarter 1 & 2** and press [**ENTER**]

To ungroup data, select the items you want to ungroup, right-click, and then click **Ungroup**.

Practice the concept:

1. Rename the group **Quarter 1 & 2** as **First Half (Year)**.

2. Group **Qtr 3** and **Qtr 4**.

3. Name the group as **Second Half (Year)**.

4. Collapse the levels so that only the **group** and **grand totals** are visible.

5. Close **Pivot Group.xlsx** file.

6.14 REVIEW EXERCISE

Create and Revise Pivot Table Reports

1. Open **Cards.xlsx** file.

2. Create a PivotTable report from the data range **A3:H207**. Place the PivotTable report in a new worksheet.

3. Create the following layout.

Field	Area
Date	**FILTERS**
Section	**ROWS**
Payment Type	**COLUMNS**
Total	**VALUES**

4. Use the **Date** list to display only the sales for **02/08/2012**.

5. Display the **Transactions** worksheet and change the number in cell **F6** to **231**.

6. Display the **Sheet1** worksheet and refresh the PivotTable report.

7. Change the **Date** list to display all dates.

8. Move the **Date** field to the **ROWS** area.

9. Display the number of transactions for each date by changing the summary function for the values area to **Count**. Then, return the summary function to **Sum**.

10. Group the date values by **Month**.

11. Group the column labels **MasterCard** and **Visa**.

12. Name the group as **Credit Card**.

13. Move the grouped **Date** field to the **FILTERS** area.

14. Hide **Bags** and **Shoes** in the **Section** field.

15. Create a separate PivotTable report for each **Month** item in the **FILTERS** area.

16. Select the **Aug** sheet and apply **Pivot Style Dark 6**.

17. Close the workbook without saving

LESSON 7 -
USING AUDITING TOOLS AND RANGE NAMES

In this section, you will learn about:

- Jumping to a named range
- Assigning names
- Using range names in formulas
- Creating range names from headings
- Applying range names
- Deleting range names
- Using range names in 3-D formulas
- Displaying/removing dependent arrows
- Displaying/removing precedent arrows
- Showing formulas

7.1 JUMPING TO A NAMED RANGE

Concepts

Naming a cell range in a spreadsheet makes it easy to find the cell range quickly. After you have given a cell range a descriptive name, the name is stored in the **Name box** drop-down list located at the end of the formula bar. When you open the **Name box** drop-down list and click on a cell range name, the range is immediately displayed and selected.
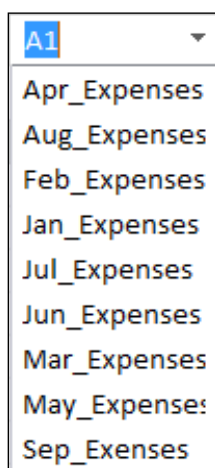
Steps

Jump to a named range.

Open **Range Names.xlsx** file.

1. Click the drop down arrow for the **Name Box** list on the formula bar. *A list of available named ranges appears.*	Click
2. Select the name of the desired range. *The range appears.*	Click **Aug_Expenses**

Notice that the active cell moved to the **Second Half** worksheet. Use the **Jan_Expenses** name on the **Name Box** list to return to the **First Half** worksheet.

7.2 ASSIGNING NAMES

Concepts

There are certain rules that must be followed when naming a cell range:

- All names must start with a letter.

- A name can contain an underscore (_) but the name cannot have spaces or any other special characters.

- All names must be different from each other.

- You cannot create a range name that matches a valid cell address. For example, **BB12** is not a valid range name because every worksheet has a cell with the address **BB12**.

Steps

Assign a name to a range.

If necessary, go to the **First Half** worksheet.

1. Select the cell or range you want to name. *The range is selected.*	Click **H3**
2. Click in the **Name Box** on the formula bar. *The cell reference in the **Name Box** is selected.*	Click in the **Name Box**
3. Type the desired name. *The text appears in the **Name Box**.*	Type **First_Income**
4. Press [**ENTER**]. *The name is saved and appears in the **Name Box**.*	Press [**ENTER**]

Practice the concept:

1. Name the cell **H9** as **First_Expenses**.

2. In the **Second Half** worksheet, name the cell **H3** as **Second_Income** and **H9** as **Second_Expenses**.

To delete a name from a cell range:

1. Select Name Manager in the Defined Names group in the **FORMULAS** tab.

2. Select the name to delete from the **Name** list box and click **Delete**.

3. Click **OK**.

4. Click **Close.**

7.3 USING RANGE NAMES IN FORMULAS

Steps

Use a range name in a formula.

If necessary, go to the **First Half** worksheet. Type **% of Expenses** in cell **A16**.

1. Select the cell in which you want the result of the formula to appear. *The cell is selected.*	Click **B16**
2. Start typing the formula or function. *The formula appears in the cell and on the formula bar.*	Type **=B9/**
3. Type the desired name at the appropriate location in the formula. *The name appears in the cell and on the formula bar.*	Type **First_Expenses**
4. Press [**ENTER**]. *The result of the formula appears in the cell.*	Press [**ENTER**]

Practice the concept:

1. Select cell **C16**, type **=C9/** and press function key **[F3]**.

2. Then select **First_Expenses**, click **OK**, and press [**ENTER**] to complete the formula.

3. Copy the formula to the range **D16:G16**.

4. Click on any of the cell in the range **D16:G16**.

5. Notice that the name did not change when you copied the cell.

7.4 CREATING RANGE NAMES FROM HEADINGS
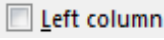
💡 Concepts

Names for rows and columns are created by using any text in the first or last cell of the row or the top or bottom cell of the column. A row or column name is stored in the Name box drop-down list located at the end of the formula bar. When you open the Name box drop-down list and click on a row or column name, the row or column is immediately selected and displayed. The cell in the row or column containing the text from which the name was taken is not displayed as part of the selection.

👣 Steps

Create range names from headings.

If necessary, go to **First Half** worksheet.

1. Select the range you want to name, as well as the row or column heading containing the desired range names. *The range is selected.*	Select **A5:G8**
2. Select the **FORMULAS** tab. *The **FORMULAS** tab is displayed.*	Click **FORMULAS**
3. Select the **Create from Selection** button in the **Defined Names** group. The **Create Names from Selection** dialog box opens.	Click 🔲 Create from Selection
4. Under **Create names from values in the:**, select the option corresponding to the location of the desired names. *The option is selected.*	Click 🔲 Left column, if necessary
5. Select **OK**. *The **Create Names from Selection** dialog box closes, and the names are created from the row and/or column headings.*	Click OK

Display the Name Box list on the formula bar; notice that a name was created for each heading in the range. Select the Utilities name. Click any cell to deselect the range.

7.5 APPLYING RANGE NAMES

💡 Concepts

To use range names in existing formulas you must replace cell references with range names in existing formulas. This technique is called applying names.
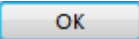
👣 Steps

Apply range names to formulas.

If necessary, go to **First Half** worksheet.

1. Select the cell or range in which you want to apply range names. *The cell or range is selected.*	Select **B14**
2. Select the **FORMULAS** tab. *The FORMULAS tab is displayed.*	Click **FORMULAS**
3. Select the **Define Name** drop down list in the **Defined Names** group. *The Define Name menu opens.*	Click 🔲 Define Name ▾
4. Select the **Apply Names** command. *The Apply Names dialog box opens, and any suggested names are highlighted in the Apply names list box.*	Click **Apply Names**
5. Select the names you want to apply in the **Apply names** list box, if necessary. *The names are selected.*	Select the following names in the **Apply names** list box: • **First_Income** • **First_Expenses**.

| 6. Select **OK**.

*The **Apply Names** dialog box closes, and the names replace the cell addresses in all formulas in the selected range.* | Click [OK] |

Notice that the cell addresses have been replaced by names in the formula.
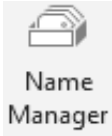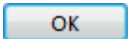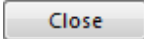
7.6 DELETING RANGE NAMES

👣 Steps

Delete a range name.

If necessary, go to **First Half** worksheet.

1. Select the **FORMULAS** tab. *The **FORMULAS** tab is displayed.*	Click **FORMULAS**
2. Select the **Name Manager** button in the **Defined Names** group. *The **Name Manager** dialog box opens.*	Click Name Manager
3. Select the name you want to delete from the **Name** list box. *The range name is selected.*	Click **First_Income**
4. Select **Delete**. *A warning dialog box opens.*	Click [Delete]
5. Select **OK**. *The range name is deleted from the workbook and the warning dialog box closes.*	Click [OK]
6. Select **Close**. *The **Name Manager** dialog box closes.*	Click [Close]

Practice the concept:

1. Click cell **B14**.

2. Notice that the formula in cell **B14** now displays an error message, **#NAME?**, and the **Error Checking** button appears.

3. Re-create the range name **First_Income** for the range **H3**.

4. Notice that the formula updates.

7.7 USING RANGE NAMES IN 3-D FORMULAS

Steps

Use range names in a 3-D formula.

1. Select the worksheet in which you want to create the formula. *The worksheet appears.*	Click the **Summary** worksheet tab
2. Select the cell in which you want to create the formula. *The cell is selected.*	Click cell **B3**
3. Type **=** to start the formula. *An equal sign (=) appears in the cell and on the formula bar.*	Type **=**
4. Press function key [**F3**]. *The **Paste Name** dialog box opens.*	Press [**F3**]
5. Double-click the desired name. *The name appears in the cell and on the formula bar.*	Double-click **First_Income**
6. Type the desired mathematical operator. *The mathematical operator appears.*	Type **+**

7. Enter names and mathematical operators as necessary to complete the formula. *The formula appears on the formula bar.*	Double-click **Second_Income**
8. Press [**ENTER**]. *The result of the formula appears in the cell.*	Press [**ENTER**]

Practice the concept:

1. Enter the formula **=First_Expenses+Second_Expenses** in cell **B9**.

2. Select cell **B11** and start the **AutoSum** function.

3. Select the **First Half** worksheet and select the cell range **B11:G11**.

4. Press [**SHIFT**] and select the **Second Half** worksheet. Press [**ENTER**].

5. Close Range **Names.xlsx** file.

7.8 DISPLAYING/REMOVING DEPENDENT ARROWS

Steps

Display and remove dependent arrows.

Open **Audit.xlsx** file.

1. Select the cell for which you want to view dependents. *The cell is selected.*	Click cell **E5**
2. Select the **FORMULAS** tab. *The FORMULAS tab is displayed.*	Click **FORMULAS**
3. To view direct dependents of the cell, select the **Trace Dependents** button in the **Formula Auditing** group. *Tracer arrows point to each directly dependent cell.*	Click Trace Dependents

4. To view the first level of indirect dependents, select the **Trace Dependents** button in the **Formula Auditing** group again. *Additional tracer arrows point to the first level of indirectly dependent cells.*	Click ⬚ Trace Dependents
5. To view additional levels of indirect dependents, select the **Trace Dependents** button in the **Formula Auditing** group, as necessary. *Additional tracer arrows point to the next level of indirectly dependent cells.*	Click ⬚ Trace Dependents
6. To remove all tracer arrows, select **Remove Arrows** button in the **Formula Auditing** group. *All tracer arrows are removed from the worksheet.*	Click ✕ Remove Arrows ▾

	E	F	G	H	I	J	K	L
2	r				This Year			Yearly Average
3	**Qtr 4**	**Total**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Total**	
4								
5	2,445	10,457	2,488	2,442	2,666	3,333	10,929	10,693
6	23,232	84,272	5,644	33,331	24,445	43,555	106,975	95,624
7	144	1,134	58	3,555	433	1,333	5,379	3,257
8								
9	25,821	95,863	8,190	39,328	27,544	48,221	123,283	109,573
10								
11	**Qtr 4**	**Total**	**Qtr 1**	**Qtr 2**	**Qtr 3**	**Qtr 4**	**Total**	
12	433	2,209	334	344	345	766	1,789	1,999
13	1,200	4,966	1,233	1,100	1,433	1,200	4,966	4,966
14	555	2,198	544	655	444	555	2,198	2,198
15	-	3,566	3,566	-	-	-	3,566	3,566
16	311	1,410	344	433	322	311	1,410	1,410
17	67	268	56	45	55	43	199	234
18	1,125	4,500	1,275	1,275	1,275	1,275	5,100	4,800
19	766	11,306	667	665	544	677	2,553	6,930
20								
21	4,457	30,423	8,019	4,517	4,418	4,827	21,781	26,102
22								
23	30,278	126,286	16,209	43,845	31,962	53,048	145,064	135,675

Practice the concept:

1. Select cell **F9**.

2. Click the **Trace Dependents** button to display the direct dependents.

3. Notice that two cells are direct dependents of the cell (cells **F23** and **L9**).

4. Click the **Trace Dependents** button again to display the first level of indirect dependents (cell **L23**).

5. Click the **Trace Dependents** button again.

6. Notice that no additional arrows are displayed; there are no more levels of dependent cells.

7. Select **Remove Dependent Arrows**.

8. Notice that Excel removes the next level of arrows
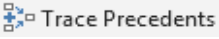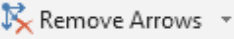
7.9 DISPLAYING/REMOVING PRECEDENT ARROWS

👣 Steps

Display and remove precedent arrows.

1. Select the cell containing the formula for which you want to view the precedents. *The cell is selected.*	Click cell **L9**
2. Select the **FORMULAS** tab. *The **FORMULAS** tab is displayed.*	Click **FORMULAS**
3. To view direct precedents of the formula, select the **Trace Precedents** button in the **Formula Auditing** group. *Tracer arrows point from each direct precedent cell to the cell containing the formula.*	Click 🔲 Trace Precedents
4. To view the first level of indirect precedents, select the **Trace Precedents** button in the **Formula Auditing** group again. *Additional tracer arrows point from the first level of indirect precedents to the direct precedent cells.*	Click 🔲 Trace Precedents

5. To view additional levels of indirect precedents, select the **Trace Precedents** button in the **Formula Auditing** group, as necessary. *Additional tracer arrows point from the next level of indirect precedent cells.*	Click ⊞ Trace Precedents
6. To remove all tracer arrows, select **Remove Arrows** button in the **Formula Auditing** group. *All tracer arrows are removed from the worksheet.*	Click ✗ Remove Arrows ▾

	B	C	D	E	F	G	H	I	J	K	L
5	3,000	3,012	2,000	2,445	10,457	2,488	2,442	2,666	3,333	10,929	10,693
6	12,963	25,632	22,445	23,232	84,272	5,644	33,331	24,445	43,555	106,975	95,624
7	258	466	266	144	1,134	58	3,555	433	1,333	5,379	3,257
8											
9	16,221	29,110	24,711	25,821	95,863	8,190	39,328	27,544	48,221	123,283	109,573

Practice the concept:

1. Select cell **F9**.

2. Click the **Trace Precedents** button to display the direct precedents.

3. Notice that three cells are direct precedents of the formula in cell H11 (cells **F5**, **F6**, and **F7**).

4. Click the **Trace Precedents** button again to display the first level of indirect precedents.

5. Click **Remove Arrows** to remove all tracer arrows.

7.10 SHOWING FORMULAS

👣 Steps

Display worksheet formulas.

1. Select the **FORMULAS** tab. *The **FORMULAS** tab is displayed.*	Click **FORMULAS**
2. Select the **Show Formulas** button in the **Formula Auditing** group. *The **Show Formulas** button is highlighted, worksheet column widths expand and cells containing formulas display the formula instead of the result.*	Click 🔲 Show Formulas
3. Select a cell containing a formula. *The cell is selected, colors are applied to the references in the formula and correspondingly colored borders appear around the referenced cells.*	Click cell **F23**
4. Select the **Show Formulas** button in the **Formula Auditing** group. *The worksheet column widths return to their previous size, cells containing formulas display the result instead of the formula and highlighting is removed from the **Show Formulas** button.*	Click 🔲 Show Formulas

Close **Audit.xlsx** file.

7.11 REVIEW EXERCISE

Using range names and formula auditing tools

1. Open **Checking.xlsx** file.

2. Display the **FORMULAS** tab.

3. Display all dependent cells for cell **E8**. Then, remove one level of dependent arrows.

4. Display all precedent cells for cell **I13**. Then, remove one level of precedent arrows.

5. Remove all displayed tracer arrows.

6. Select the range **B4:D12** and create range names for each column from the column headings.

7. Use the **Name Box** list to jump to the **Nov** range.

8. Delete the **Oct**, **Nov**, and **Dec** range names you just created.

9. Close the workbook without saving.

10. Open **Stores.xlsx** file.

11. Display the **Summary** worksheet.

12. Select cell **B6** on the **Summary** worksheet. Create a 3-D sum formula using the cells **E6** from **Qtr1**, **Qtr2**, **Qtr3**, and **Qtr4** worksheets.

13. Copy the formula to the cell range **B7**, **B13:B17**.

14. Close the workbook without saving

LESSON 8 -
IMPORTING AND LINKING DATA

In this section, you will learn about:

- Link data within a spreadsheet, between spreadsheets, between applications
- Importing data from text files
- Removing linked data
- Creating a hyperlink
- Editing a hyperlink

8.1 LINKING DATA WITHIN A SPREADSHEET

Concepts
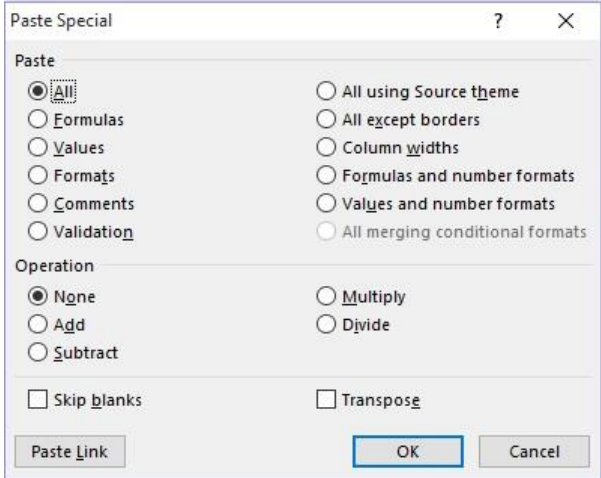
To link data within a spreadsheet, between spreadsheets or between applications you copy the original data and then use the Paste Special option to paste a link formula to the new location. If the original data is updated, then the update will also be reflected in the cell containing the Link formula.

Steps
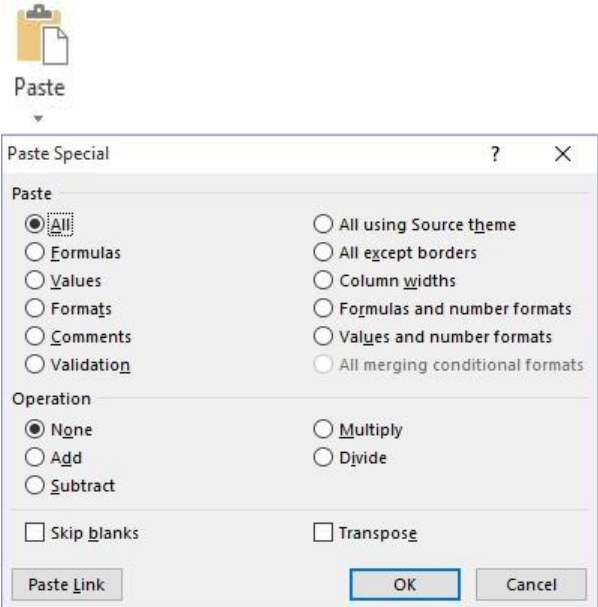
Link data within a spreadsheet.

Open **Link within a spreadsheet.xlsx.** If necessary, display the **New York** worksheet.

1. Select the source data. *The source data is selected.*	Select **B6**
2. Select the **HOME** tab. *The HOME tab is displayed*	Click **HOME**
3. In the Clipboard group select the Copy button.	Click [icon] Copy
4. Select the **Total Revenue** sheet and select **B4**.	Click **B4**
5. In the Clipboard group select the **Paste** button arrow and select **Paste Special**. From the Paste Special window select **Paste Link**. The following formula is displayed in the formula bar. ='New York'!$B$6	
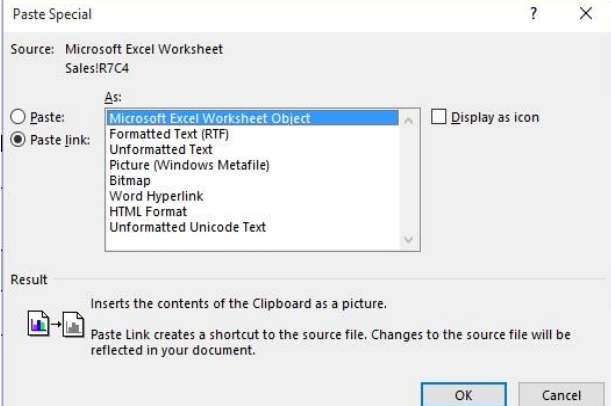
Link data between spreadsheets.

Open the two workbooks, **Price List.xlsx** and **Sales.xls**. You are going to link the book price cell **C4** in **Price List.xlsx** with the price cell **C4** in **Sales.xls.**

1. Switch to **Price List.xlsx.** Select the source data. *The source data is selected.*	Select **C4**
6. Select the **HOME** tab. *The HOME tab is displayed*	
7. In the Clipboard group select the **Copy** button.	Click ⧉ Copy
8. Switch to **Sales.xlsx.** Select the destination cell. *The* destination cell *is selected.*	Select **C4**
9. In the Clipboard group select the **Paste** button arrow and select **Paste Special**. From the Paste Special window select **Paste Link**. The following formula is displayed in the formula bar. ='Price List.xlsx'!$C$4	Paste Paste Special Paste ● All ○ All using Source theme ○ Formulas ○ All except borders ○ Values ○ Column widths ○ Formats ○ Formulas and number formats ○ Comments ○ Values and number formats ○ Validation ○ All merging conditional formats Operation ● None ○ Multiply ○ Add ○ Divide ○ Subtract ☐ Skip blanks ☐ Transpose Paste Link OK Cancel

Link data between applications.

Open the workbook **Sales.xlsx** and the word document **Sales Report.docx**. You are going to link the Quantity cell **D7** in **Sales.xlsx** with the Quantity cell in **Sales Report.docx.**

---

1. Switch to **Sales.xlsx.** Select the source data. *The source data is selected.*	Select **D7**
2. Select the **HOME** tab. *The HOME tab is displayed*	Click **HOME**
3. In the Clipboard group select the **Copy** button.	Click ⧉ Copy
4. Switch to **Sales Report.docx** Select the destination cell. *The destination cell is selected.*	Select the blank cell in the 4th column 2nd row.
5. In the Clipboard group select the **Paste** button arrow. Select **Paste Special**. **The Paste Special window opens.**	Paste
6. From the **Paste Special window** choose **Microsoft Office Excel Worksheet Object** and click **Paste link**. Click **OK**.	

8.2 IMPORTING DATA FROM TEXT FILES
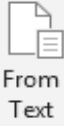
Steps
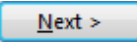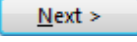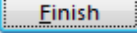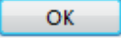
Import data from a text file into an Excel worksheet.

Open **Importing.xlsx**. If necessary, display the **Sales** worksheet.

1. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
2. Select the **From Text** button in the **Get External Data** group. *The **Import Text File** dialog box opens.*	Click **From Text**
3. Select the folder in which the text file you want to import is located. *The contents of the folder are displayed.*	Double-click to open the Student Folder
4. Select the name of the text file you want to import. *The file name is highlighted in the list and appears in the **File name** box.*	Click **MaySales.txt** file
5. Select **Import**. *The **Import Text File** dialog box closes and the **Text Import Wizard** dialog box opens at **Step 1 of 3** with the **Delimited** option selected.*	Click **Import**
6. Specify the data header. *The first row of the data is set as header.*	Check the option ☑ My data has headers.

7. Select **Next**. *The **Text Import Wizard** progresses to **Step 2 of 3** with the data to be imported displayed in the **Data preview** pane.*	Click [Next >]
8. Select the delimiter used in the text file. *The delimiter is selected.*	Uncheck the ☐ Tab option and check the ☑ Comma option
9. Select **Next**. *The **Text Import Wizard** progresses to **Step 3 of 3** with the data separated into columns in the **Data preview** pane.*	Click [Next >]
10. Select the column you want to format or skip in the **Data preview** pane. *The column is selected.*	Click the **Discount** column (third column)
11. Under **Column data format**, select the desired format option. *The format option is selected.*	Click ◉ Do not import column (skip)
12. Select **Finish**. *The **Text Import Wizard** dialog box closes, and the **Import Data** dialog box opens with the **Existing worksheet** option selected.*	Click [Finish]
13. Select the location where you want the imported data to appear. *The cell is selected, and its address appears in the **Existing worksheet** box.*	Click cell **A3**
14. Select **OK**. *The **Import Data** dialog box closes and the imported data appears in the worksheet.*	Click [OK]

Note: To **refresh** the data, right-click any cell in the imported data range and then click the **Refresh** option in the shortcut menu, select the text file and then click the **Import** button.

Practice the concept:

1. Display the **Credit Limit** worksheet.

2. **Import** the tab delimited text file, **Limits.txt** and place the data starting from cell **A5**.

8.3 REMOVING LINKED DATA

Steps

You can update linked data or remove linked data from an existing worksheet.

Remove linked data from existing worksheet.

The **Sales.xlsx** workbook contains linked cell contents from another Excel workbook. The linked cells are created from a paste special, paste link. You can remove the linked content from this worksheet while keeping the current values.

Display the **Sales** worksheet. Click cell C4 to view the formula bar.

1. Select the cell containing the link *The cell is selected.*	Click cell **C4**
2. Select the **DATA** tab. *The DATA tab is displayed.*	Click **DATA** tab
3. Select Edit Link from the Connections group. *The Edit Link dialog box is displayed.*	Click **Edit Links**
4. Select the options as desired. *An alert is displayed to prompt user for confirmation.*	Click **Update Values** to update a link Or Click **Break Link**. to break a link
5. Select **Break Links** button. *The alert box closes, and the link is removed.*	Click **Break Links** to confirm

Close the dialog box. View the formula bar. Notice that only the value is displayed instead of formulas.

Close **Sales.xlsx**.
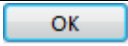
8.4 CREATING A HYPERLINK

Steps

Create a hyperlink.

Open **Hyperlinks.xlsx** file.

1. Select the cell or object you want to link. *The cell is selected.*	Click cell **A9**
2. Select the **Hyperlink** button in the **Links** group on the **INSERT** tab. *The Insert Hyperlink dialog box opens.*	Click Hyperlink
3. Select the **Existing File or Web Page** option. *Existing File or Web Page is selected.*	Click **Existing File or Web Page**, if necessary
4. Select the **Look in** list. *A list of available file locations appears.*	Click **Look in**
5. Open the folder containing the file to which you want to link. *A list of available folders and files appears.*	Double-click the **Student Folder**
6. Select the file to which you want to link. *The file is selected, and the file name appears in the Address box.*	Scroll as necessary and click **Gifts List**
7. Select the **OK** button. *The Insert Hyperlink dialog box closes, and the text in the selected cell appears as a hyperlink.*	Click OK
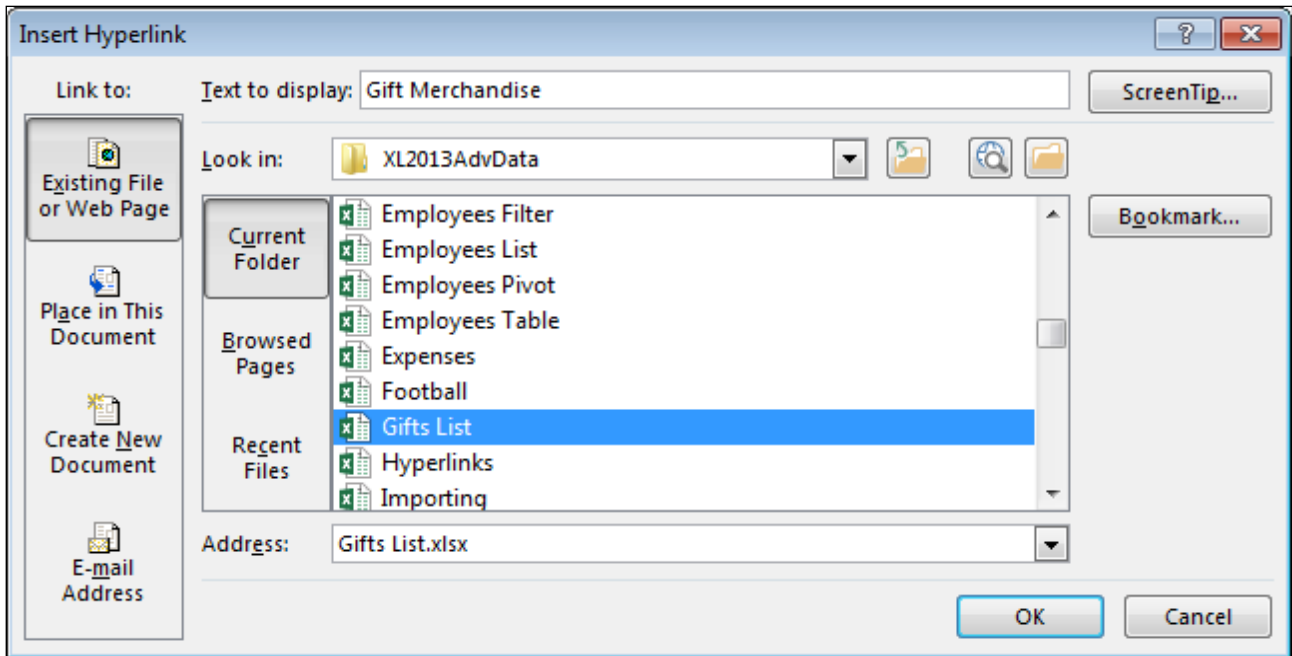
Point to the **Gift Merchandise** link in cell **A9**. Notice that the mouse pointer changes shape and the path or URL appears in the **ScreenTip**.

Click the **Gift Merchandise** hyperlink to open the **Gifts List** workbook. Close the **Gifts List** workbook.

Practice the concept:
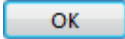
1. Select cell **A14** and create a hyperlink to the named range **salaries** in the **Personnel List** workbook.

2. Use the **Salary** hyperlink to display the **Personnel List** workbook then close the **Personnel List** workbook.

8.5 EDITING A HYPERLINK

Steps

If necessary, open **Hyperlinks.xlsx** file.

1. Right-click the hyperlink you want to edit. *A shortcut menu appears.*	Right-click **Gift Merchandise** hyperlink in cell **A9**
2. Select **Edit Hyperlink**. *The **Edit Hyperlink** dialog box opens.*	Click **Edit Hyperlink**
3. Make the desired changes. *The changes are made.*	• Select the **ScreenTip** button • Type **Click to gifts list** • Select **OK** to close the **Set Hyperlink ScreenTip** dialog box
4. Select the **OK** button. *The **Edit Hyperlink** dialog box closes and the changes to the hyperlink are saved.*	Click OK

Point to the **Gift Merchandise** hyperlink; notice the new ScreenTip.

Practice the concept:

Create a customised ScreenTip with the message **Click to view salary breakdown** for the **Salary** hyperlink in cell **A14**.

8.6 REMOVING A HYPERLINK

Steps

If necessary, open **Hyperlinks.xlsx** file.

1. Right-click the hyperlink you want to edit. *A shortcut menu appears.*	Right-click **Gift Merchandise** hyperlink in cell **A9**

2. Select **Remove Hyperlink**.	Click **Remove Hyperlink.**
*The **Hyperlink** is removed.*	

Close **Hyperlinks.xlsx**.

8.7 REVIEW EXERCISE

Importing and linking data

1. Open **Payroll.xlsx** file.

2. Import the **Details.txt** text file. Select **Comma** as the delimiter. Do not import the **ProfitShare** field. Place the data starting in cell **A4** in the worksheet.

3. Change the **External Data Range Properties** of the table to refresh every 10 minutes.

4. Insert a hyperlink in **G1** to the **Contributions.xlsx** file.

5. Close the workbook without saving.

LESSON 9 -
USING ADVANCED FUNCTIONS

In this section, you will learn about:

- Using the VLOOKUP function
- Using the HLOOKUP function
- Using the IF function
- Using Nested IF functions
- Using an AND condition with IF
- Using an OR condition with IF
- Using the ROUND function
- Using date functions
- Using the COUNTIF function
- Using the COUNTBLANK function
- Using RANK function
- Using financial functions
- Using text functions
- Using a 3-D reference within a SUM function
- Use mixed references in formulas

9.1 USING THE VLOOKUP FUNCTION

Concepts

The **VLOOKUP** function looks up information in a table array. The **VLOOKUP** searches vertically down the first column of a table array until it finds the value you specify. When it finds the specified value, it then looks across the row and returns the value in the column you specify.

The **VLOOKUP** function consists of three required arguments, in the following order: lookup value, table array, and column index number.

Lookup **value**: The value for which you want to find matching data and must appear in the first column of the lookup table; it can be a value, a text string, or a cell reference.

Table **array:** Name or address of the lookup table.

Column **index number:** Determines which column is used to find the item; the columns are numbered sequentially from the beginning of the table.
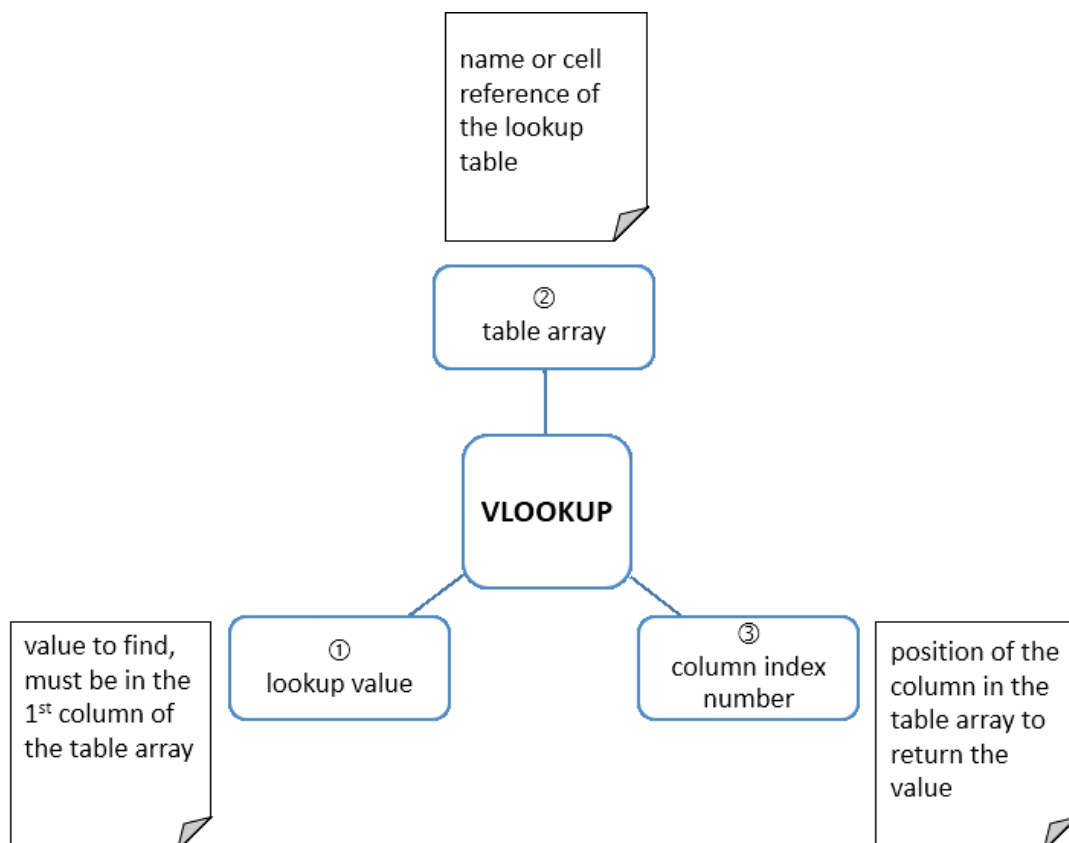
The **VLOOKUP** function also has an optional fourth argument: range lookup. This is a logical value that specifies whether you want **VLOOKUP** to find an exact

match (**FALSE**) or an approximate match (**TRUE**). If a range lookup argument is not entered, **VLOOKUP** finds approximate matches. In this case, the lookup table must be sorted in ascending order by the first column; otherwise **VLOOKUP** may not return the correct value.

For example, you might want to use the lookup table shown below and a column index number of **2** to look up the percent of discount to be given to a customer, based on various order amount levels.

	A	B
1	Order	Discount
2	0	0%
3	2500	2%
4	5000	3%
5	8000	4%
6	10000	5%

If the order amount you want to look up is **8000**, the discount would be **4%**; Excel finds the lookup value (**8000**) in the first column and returns the value in the second column of the same row.

In approximate matches, if the lookup value does not appear in the first column of the lookup table, but falls between two values in it, Excel will use the lower of the two values. If the lookup value is smaller than any value in the first column of the lookup table, Excel returns an error message.

For example, using the lookup table shown above and a column index number of 2, if the sales figure you look up is **7700**, the commission would be **3%**. Since Excel determines that **7700** is located between the numbers **5000** and **8000**, it returns the value in the second column of the same row as the lower number.

If a match is not found, the error value **#N/A** is returned.

🐾 Steps

Use the VLOOKUP function.

Open **Advanced Functions.xlsx** file. Display the **Insurance** worksheet. Select **rates** from the **Name box** to view the lookup table.

Use the **VLOOKUP** function to lookup the **Age** in the **rates** table and retrieve the **Rate %** from the second column.

1. Select the cell in which you want the result of the **VLOOKUP** function to appear. *The cell is selected.*	Click cell **F6**
2. Type **=VLOOKUP** and an open parenthesis (**(**). *=VLOOKUP(appears in the cell and on the formula bar. As you start typing a function, a Screen Tip is displayed to help you enter valid arguments.*	Type **=VLOOKUP(**
3. Select the cell containing the value you want to look up and a comma. *A dash marquee appears around the cell and its address appears in the VLOOKUP function.*	Click cell **B6,**
4. Type the name or address of the lookup table and a comma. *The text appears in the VLOOKUP function.*	Type **rates,**
5. Enter the column index number and if necessary type a comma and indicate the range lookup as **FALSE** for exact match. *The column index number appears in the VLOOKUP function.*	Type **2**
6. Type the closing parenthesis (**)**). *The closing parenthesis (**)**) appears in the VLOOKUP function.*	Type **)**
7. Press [**ENTER**]. *The result of the VLOOKUP function appears in the cell.*	Press [**ENTER**]

Copy the formula to the range **F7:F15**. Then, click anywhere in the worksheet to deselect the range.

9.2 USING THE HLOOKUP FUNCTION

💡 Concepts

The **HLOOKUP** function also looks up information in a table array, however it searches horizontally across the top most row of a table array until it finds the value you specify. When it finds the specified value, it then looks down the column and returns the value in row you specify.

The HLOOKUP function consists of three required arguments, in the following order: lookup value, table array, and row index number.

Lookup value: The value for which you want to find matching data and must appear in the first row of the lookup table; it can be a value, a text string, or a cell reference.

Table array: Name or address of the lookup table.

Row index number: Determines which row is used to find the item; the rows are numbered sequentially from the top of the table.
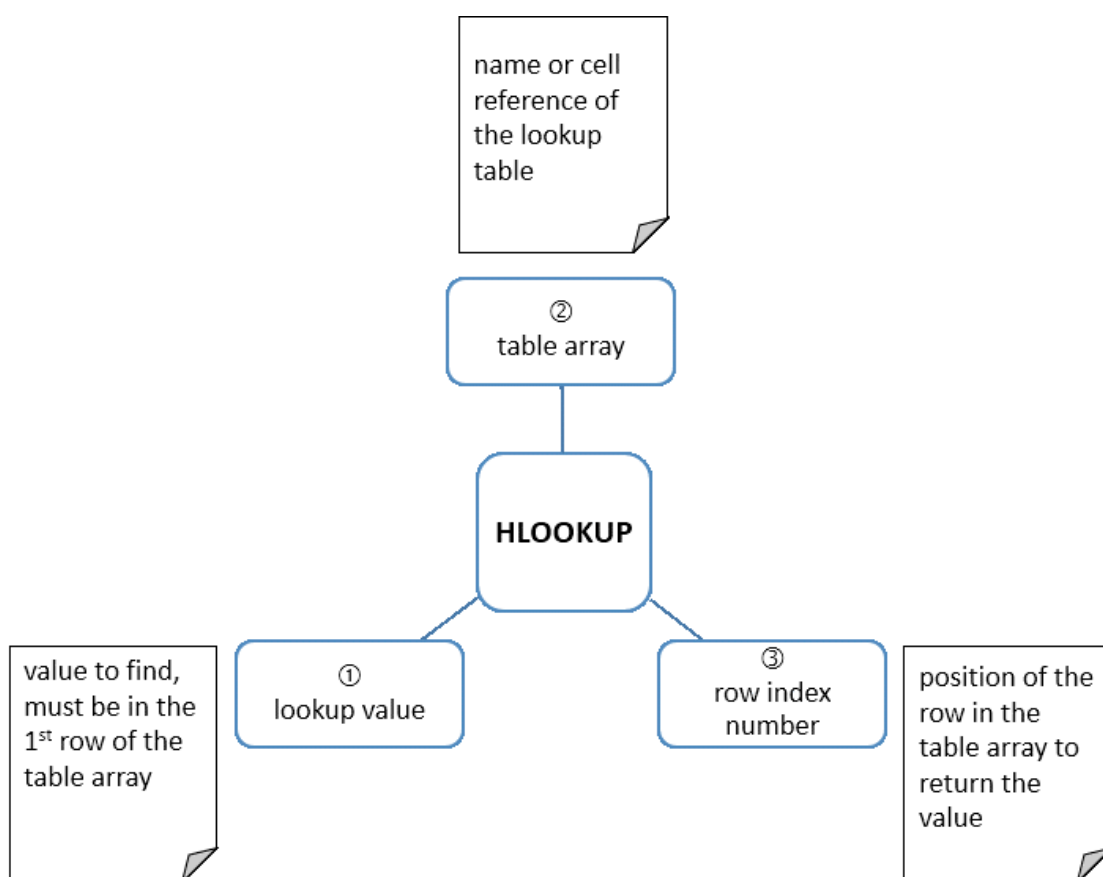
Similar to **VLOOKUP**, the **HLOOKUP** function also has an optional fourth argument: range lookup. This is a logical value that specifies whether you want **HLOOKUP** to find an exact match (**FALSE**) or an approximate match (**TRUE**). If a range lookup argument is not entered, **HLOOKUP** finds approximate matches. In this case, the lookup table must be sorted in ascending order by the first row; otherwise **HLOOKUP** may not return the correct value.

For example, you might want to use the lookup table shown below and a row index number of **2** to look up the percent of discount to be given to a customer, based on various order amount levels.

	A	B	C	D	E	F
1	Order	0	2500	5000	8000	10000
2	Discount	0%	2%	3%	4%	5%

If the order amount you want to look up is 8000, the discount would be 4%; Excel finds the lookup value (8000) in the first row and returns the value in the second row of the same column.

In approximate matches, if the lookup value does not appear in the first row of the lookup table, but falls between two values in it, Excel will use the lower of the two values. If the lookup value is smaller than any value in the first row of the lookup table, Excel returns an error message.

For example, using the lookup table shown above and a row index number of 2, if the sales figure you look up is 7700, the commission would be 3%. Since Excel determines that 7700 is located between the numbers 5000 and 8000, it returns the value in the second row of the same column as the lower number.

If a match is not found, the error value #N/A is returned.

👣 Steps

Use the HLOOKUP function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Insurance** worksheet.

Select rates from the **Name** box to view the lookup table. Use the HLOOKUP function to lookup the Category in the charges table and retrieve the Loading Charge from the third row.

1. Select the cell in which you want the result of the **HLOOKUP** function to appear. *The cell is selected.*	Click cell **G6**
2. Type **=HLOOKUP** and an open parenthesis (**(**). *=HLOOKUP(appears in the cell and on the formula bar. As you start typing a function, a Screen Tip is displayed to help you enter valid arguments.*	Type **=HLOOKUP(**
3. Select the cell containing the value you want to look up and a comma. *A dash marquee appears around the cell and its address appears in the HLOOKUP function.*	Click cell **C6,**
4. Type the name or address of the lookup table and a comma. *The text appears in the HLOOKUP function.*	Type **charges,**
5. Enter the row index number and if necessary type a comma and indicate the range lookup as **FALSE** for exact match *The row index number appears in the HLOOKUP function.*	Type **3,FALSE**
6. Type the closing parenthesis (**)**). *The closing parenthesis ( )) appears in the HLOOKUP function.*	Type **)**
7. Press [**ENTER**]. *The result of the HLOOKUP function appears in the cell.*	Press [**ENTER**]

Copy the formula to the range **G7:G15**. Then, click anywhere in the worksheet to deselect the range.

9.3 USING THE IF FUNCTION

Concepts

The IF function checks if the conditions of a logical test are complied with, or not, on a selected cell range and returns one value if true and a different value if false.

For example, you can use the IF function to decide if an order qualifies for free shipping. If the order value is greater than the specified amount, the order's shipping is set to zero. If the order value is less than the specified amount, the order's shipping rate is calculated.

Note: You can also use the IF function to display text as a result of a logical test, but you must enclose the text you want to display in quotation marks.

The syntax of an IF function is:

=IF(logical test,action if true,action if false)

The following comparison operators can be used in an IF function:

=	Equals to or the same as
<=	Less than or equals to
<>	Not equal to
<	Less than
>	Greater than
>=	Greater than or equals to

action if true	The desired result if the logical test is true. It can be a number, formula, cell reference, cell name, text in quotes, or another function.
action if false	The desired result if the logical test is false. It can be a number, formula, cell reference, cell name, text in quotes, or another function.

Some examples of the IF function:

Example 1:   =IF(C3>50,D3*10%,0)

If the number in C3 is greater than 50, then multiply the number in D3 by 10%; if it is not greater than 50 then return the number 0.

Example 2:   =IF(C3<=40,"Pass","Fail")

If the number in **C3** is less than or equal to 40, then enter the text Pass in the current cell; if it is not less than or equal to 40 then enter the text Fail.

Steps

Use the IF function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Reduction** worksheet.

Use the IF function to determine the Discount Reduction amount based on the Insurance Claims status. If the status is No, then calculate 35% of the Loading Charge, else display 0.

1. Select the cell in which you want the result of the **IF** function to appear. *The cell is selected.*	Click cell **H6**
2. Type **=IF** and an open parenthesis (**(**). *=IF(appears in the cell and on the formula bar. As you start typing a function, a Screen Tip is displayed to help you enter valid arguments.*	Type **=IF(**

3. Type the logical test and a comma. *The text appears in the cell and on the formula bar.*	Type **D6="No",**
4. Type the action to be taken if the logical test is true and a comma. *The text appears in the cell and on the formula bar.*	Type **G6*35%,**
5. Type the action to be taken if the logical test is false. *The text appears in the cell and on the formula bar.*	Type **0**
6. Type the closing parenthesis (**)**). *The closing parenthesis (**)**) appears in the **IF** function.*	Type **)**
7. Press [**ENTER**]. *The result of the **IF** function appears in the cell.*	Press [**ENTER**]

Copy the formula to the range **H7:H15**. Then, click anywhere in the worksheet to deselect the range.

9.4 USING NESTED IF FUNCTIONS

💡 Concepts

The usefulness of the **IF** function can be extended by using one or more nested **IF** functions. A nested function in Excel refers to a function being placed inside one another. Nested **IF** functions increase the number of possible outcomes that can be tested for and increase the number of actions that can be taken to deal with these outcomes. The syntax of a nested **IF** function is:

=IF(logical test,action if true,IF(logical test,action if true,action if false))

👣 Steps

Use nested IF functions.

If necessary, open the **Advanced Functions.xlsx** file and display the **Real Estate** worksheet.

Use nested IF functions to calculate the commission for property agents based on their sales amount.
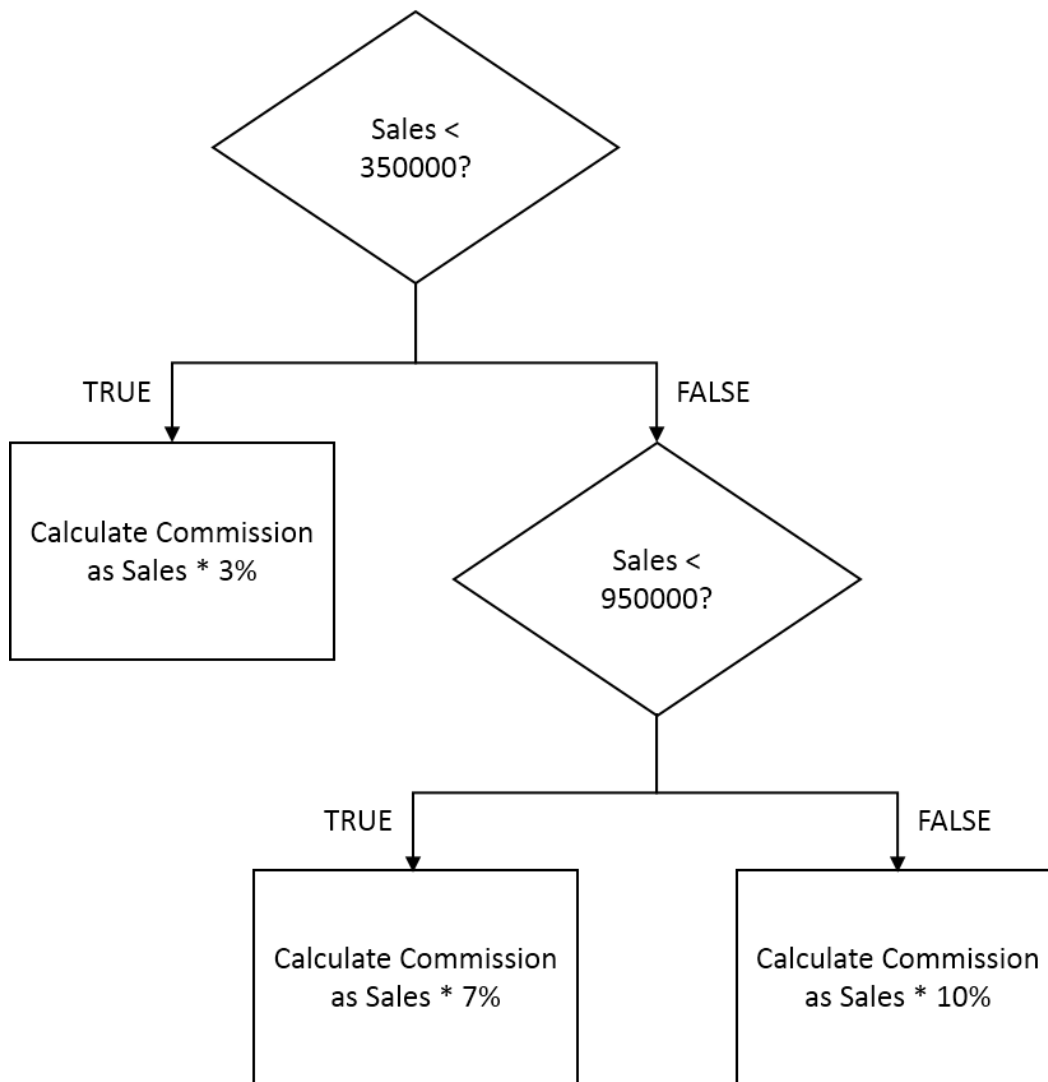
1. Select the cell in which you want the result of the nested **IF** function to appear. *The cell is selected.*	Click cell **C4**
2. Type **=IF** and an open parenthesis (**(**). *=IF(appears in the cell and on the formula bar. As you start typing a function, a Screen Tip is displayed to help you enter valid arguments.*	Type **=IF(**

3. Type the first logical test and a comma. *The text appears in the cell and on the formula bar.*	Type **B4<350000,**
4. Type the action to be taken if the first logical test is true and a comma. *The text appears in the cell and on the formula bar.*	Type **B4*3%,**
5. Type **IF** and an open parenthesis (**(**). *IF(appears in the cell and on the formula bar.*	Type **IF(**
6. Type the logical test for the second **IF** function and a comma. *The text appears in the cell and on the formula bar.*	Type **B4<=950000,**
7. Type the action to be taken if the logical test for the second **IF** function is true and a comma. *The text appears in the cell and on the formula bar.*	Type **B4*7%,**
8. Type the action to be taken if the second logical test is false. *The text appears in the cell and on the formula bar.*	Type **B4*10%**
9. Type two closing parentheses (**))**). *The closing parentheses ( ))) appear in the cell and on the formula bar.*	Type **))**
10. Press [**ENTER**]. *The result of the IF function appears in the cell.*	Press [**ENTER**]

Copy the formula to the range **C5:H15**. Then, click anywhere in the worksheet to deselect the range.

Note: You can nest up to 64 levels of functions in a formula.

9.5 USING AN AND CONDITION WITH IF

👣 Steps

Use an **AND** condition in an **IF** function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Appraisal** worksheet.

Use **AND** function in **IF** function to determine whether the staff qualifies for a performance bonus. If the **Total Score** is greater than **Previous Qtr** and **Average Score** is greater than **85**, then calculate **Score * 2**, else display **0**.

1. Select the cell in which you want the result of the **IF AND** function to appear. *The cell is selected.*	Click cell **H6**
2. Type **=IF** and an open parenthesis (**(**). *=IF(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=IF(**
3. Type the **AND** conditions and a comma. *The AND function appears in the cell and on the formula bar.*	Type **AND(E6>G6,F6>85),**
4. Type the action to be taken if all the conditions are true and a comma. *The text appears in the cell and on the formula bar.*	Type **E6*2,**
5. Type the action to be taken if any of the condition is false. *The text appears in the cell and on the formula bar.*	Type **0**
6. Type a closing parentheses (**)**) and press [**ENTER**]. *The result of the IF AND function appears in the cell.*	Type **)** and press [**ENTER**]

The correct answer is **0**, since only one condition is true. Copy the formula to the range **H7:H13**.

9.6 USING AN OR CONDITION WITH IF

Steps

Use an **OR** condition in an **IF** function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Appraisal** worksheet.

Use **OR** function in **IF** function to determine whether the staff qualifies for supervisory training. If the **Overall Productivity** is greater than 90 or the difference between **Total Score** and **Previous Qtr** is greater than **10**, then display **Yes**, else display **No**.

1. Select the cell in which you want the result of the **IF OR** function to appear. *The cell is selected.*	Click cell **I6**
2. Type **=IF** and an open parenthesis (**(**). *=IF(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=IF(**
3. Type the **OR** conditions and a comma. *The OR function appears in the cell and on the formula bar.*	Type **OR(D6>90,E6-G6>10),**
4. Type the action to be taken if any of the conditions are true and a comma. *The text appears in the cell and on the formula bar.*	Type **"Yes",**
5. Type the action to be taken if all of the condition are false. *The text appears in the cell and on the formula bar.*	Type **"No"**
6. Type a closing parentheses (**)**) and press [**ENTER**] *The result of the IF OR function appears in the cell.*	Type **)** and press [**ENTER**]

The correct answer is **No**, since both conditions are false. Copy the formula to the range **I7:I13**. Then, click anywhere in the worksheet to deselect the range.

9.7 USING THE ROUND FUNCTION

Concepts

The ROUND function rounds a number to a specified number of digits.

For example, if cell **C3** contains **43.8735**, and you want to round that value to two decimal places, you can use the following formula: **=ROUND(C3, 2)**. The result of this function is **43.87**.

Steps

Use the **ROUND** function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Prices** worksheet.

Enter a function to round the **Selling Price** to numbers without any decimal values.

1. Select the cell in which you want the result of the **ROUND** function to appear. *The cell is selected.*	Click cell **D4**
2. Type **=ROUND** and an open parenthesis (**(**). *=ROUND(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=ROUND(**
3. Type the value, formula, cell address, or function you want to round, followed by a comma. *The text appears in the cell and on the formula bar.*	Type **C4,**

4. Type the desired number of decimal places. *The text appears in the cell and on the formula bar.*	Type **0**
5. Press [**ENTER**]. *The result of the **ROUND** function appears in the cell.*	Press [**ENTER**]

Note: Instead of the **ROUND** function, you can use the **ROUNDUP** or **ROUNDDOWN** function.

- **ROUNDUP**   rounds up the value specified by the number argument

- **ROUNDDOWN**   rounds down the value specified by the number argument

9.8 USING DATE FUNCTIONS

Concepts

Following are some common date related functions:

DAY, MONTH, YEAR	Converts a date to a number representing the day, month or year.
NOW	Used as =**NOW()**. Returns the current date and time as a number and is updated as the worksheet is calculated.
TODAY	Used as =**TODAY()**. Returns the current date as a number and is updated as the worksheet is calculated.

Steps

Use date functions.

If necessary, open the **Advanced Functions.xlsx** file and display the **Invoice** worksheet.

Insert a function that updates automatically to display the current date..

1. Select the cell in which you want the current date function to appear. *The cell is selected.*	Click cell **B1**
2. Type **=TODAY()**. **=TODAY()** *appears in the cell and on the formula bar.*	Type **=TODAY()**
3. Press [**ENTER**]. *The result of the **TODAY** function appears in the cell.*	Press [**ENTER**]

Practice the concept:

1. Select cell F4.

2. Enter the function =MONTH(B4) to extract the month number from the Inv Date.

3. Copy the function to the cell range F5:F18.

4. Select cell G4.

5. Enter the function =YEAR(B4) to extract the year number from the Inv Date.

6. Copy the function to the cell range G5:G18.

9.9 USING THE COUNTIF FUNCTION

Steps

Use COUNTIF function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Invoice** worksheet.

Insert a function to count the number of invoices with amount of 10000 and above.

1. Select the cell in which you want the **COUNTIF** function to appear. *The cell is selected.*	Click cell **E20**
2. Type **=COUNTIF** and an open parenthesis (**(**). *=COUNTIF(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=COUNTIF(**
3. Select the range of cells you want to count and a comma. *The cell range is selected.*	Select **D4:D18,**
4. Type the number, text or expression that defines the data you want to count. *The criteria appears in the cell and on the formula bar.*	Type **">=10000"**
5. Type a closing parentheses (**)**). *The closing parentheses ( )) appears in the cell and on the formula bar.*	Type **)**
6. Press [**ENTER**]. *The result of the COUNTIF function appears in the cell.*	Press [**ENTER**]

Practice **the concept:**

1. Select cell E22.

2. Enter the function =COUNTIF(E4:E18,"") to count the number of unpaidinvoices (blank cells).

3. Copy the function to the cell range F5:F18.

9.10 USING THE COUNTBLANK FUNCTION

Concepts

The function COUNTBLANK is used to count empty cells in a cell range.

👣 **Steps**

Use COUNTBLANK function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Invoice** worksheet.

Insert a function to count the number of empty cells in the cell range (E4:E18).

1. Select the cell in which you want the **COUNTBLANK** function to appear. *The cell is selected.*	Click cell **E26**
2. Type the number, text or expression that defines the data you want to count. *The criteria appears in the cell and on the formula bar.*	Type =COUNTBLANK(E4:E18)
3. Type a closing parentheses (**)**). 4. *The closing parentheses (**)**) appears in the cell and on the formula bar.*	Type **)**
7. Press [**ENTER**]. *The result of the **COUNTBLANK** function appears in the cell.*	Press [**ENTER**]

9.11 USING THE SUMIF FUNCTION

👣 **Steps**

Use SUMIF function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Invoice** worksheet.

Insert a function to sum the total amount for Sail City.

1.	Select the cell in which you want the **SUMIF** function to appear. *The cell is selected.*	Click cell **E24**
2.	Type =SUMIF and an open parenthesis (( ). *=SUMIF(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=SUMIF(**
3.	Select the range of cells you want evaluated by criteria and type a comma. *The cell range is selected.*	Select **C4:C18,**
4.	Type the number, text or expression that defines the data you want to sum and a comma. *The criteria appears in the cell and on the formula bar.*	Type **"Sail City",**
5.	Select the range of cells you want to add. *The cell range is selected.*	Select **D4:D18**
6.	Type a closing parentheses ( )). *The closing parentheses ( )) appears in the cell and on the formula bar.*	Type **)**
7.	Press **[ENTER].** *The result of the SUMIF function appears in the cell.*	Press [**ENTER**]

9.12 USING THE RANK FUNCTION

Steps

Use the RANK function.

If necessary, open the **Advanced Functions.xlsx** file and display the **Ranking** worksheet.

Insert a function to rank each page against the named range **visitors** (**B5:B11**).

1. Select the cell in which you want the **RANK** function to appear. *The cell is selected.*	Click cell **C5**
2. Type **=RANK** and an open parenthesis (**(**). *=RANK(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=RANK(**
3. Select the cell which you want to rank and type a comma. *The cell is selected.*	Select **B5,**
4. Select the range of cells or enter the range name to rank against. *The cell range appears in the cell and on the formula bar.*	Type **visitors**
5. Type a closing parentheses (**)**). *The closing parentheses ( )) appears in the cell and on the formula bar.*	Type **)**
6. Press [**ENTER**]. *The result of the RANK function appears in the cell.*	Press [**ENTER**]

By default the rank order is set to **0** (descending). Type a **0** (zero) or omit the order to rank in descending order (largest to smallest). Type a **1** to rank in ascending order (smallest to largest).

9.13 USING FINANCIAL FUNCTIONS

💡 Concepts

The PMT function is used to calculate the periodic payments for a loan that has constant payments and a constant interest rate.

The syntax of the **PMT** function is:

=PMT**(rate,nper,pv)**

rate	the interest rate per period on the loan
nper	number of payments
pv	present value (the loan amount)

The **FV** (**FUTURE VALUE**) function calculates the future value of an investment assuming periodic, constant payments with a constant interest rate. The syntax of the **FV** function is as follows:

=FV(rate**,nper,pmt)**

rate	the interest rate per period for the investment
nper	number of payments
pmt	payment made each period

Steps

Use financials functions.

If necessary, open the **Advanced Functions.xlsx** file and display the **Finance** worksheet.

Use **PMT** function to calculate the monthly payment for a car loan.

1. Select the cell in which you want the **PMT** function to appear. *The cell is selected.*	Click cell **B9**
2. Type **=PMT** and an open parenthesis (**(**). *=PMT(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=PMT(**
3. Select the cell containing the interest rate (reflect as per payment period if necessary) and type a comma. *The cell range appears in the cell and on the formula bar.*	Select **B7/12,**

4. Select the cell containing the number of payments (reflect as per interest rate term if necessary) and type a comma. *The cell range appears in the cell and on the formula bar.*	Type **B5*12,**
5. Select the cell containing the loan amount. *The cell range appears in the cell and on the formula bar.*	Type **B3**
6. Type a closing parentheses (**)**). *The closing parentheses (**)**) appears in the cell and on the formula bar.*	Type **)**
7. Press [**ENTER**]. *The result of the **PMT** function appears in the cell.*	Press [**ENTER**]

By default the result is in negative because it is money being paid (cash out) rather than money to be received (cash in). Place a negative sign ("**-**") at the beginning of the function or before the **pv** value to display the answer in positive value.

Example 1:   Placing a negative sign at the beginning of the function

=-PMT(B7/12,B5*12,B3)

Example 2:   Placing a negative sign before the **pv** value

=PMT(B7/12,B5*12,-B3)

Use **FV** function to calculate the future value of a retirement investment fund.

1. Select the cell in which you want the **FV** function to appear. *The cell is selected.*	Click cell **E9**
2. Type **=FV** and an open parenthesis (**(**). *=FV(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=FV(**

3. Select the cell containing the interest rate (reflect as per investment/deposit period if necessary) and type a comma. *The cell range appears in the cell and on the formula bar.*	Select **E7,**
4. Select the cell containing the number of investments/deposits (reflect as per interest rate term if necessary) and type a comma. *The cell range appears in the cell and on the formula bar.*	Type **E5,**
5. Select the cell containing the investment/deposit amount. *The cell range appears in the cell and on the formula bar.*	Type **E3**
6. Type a closing parentheses (**)**). *The closing parentheses (**)**) appears in the cell and on the formula bar.*	Type **)**
7. Press [**ENTER**]. *The result of the **FV** function appears in the cell.*	Press [**ENTER**]

Similarly the **FV** function result will be in negative, placing a negative sign ("**-**") at the beginning of the function or before the **pmt** value will display the answer in positive value.

Example 1:   Placing a negative sign at the beginning of the function

=-FV(E7,E5,E3)

Example 2:   Placing a negative sign before the **pmt** value
=-FV(E7,E5,-E3)

9.14 USING TEXT FUNCTIONS

💡 Concepts

Joining Text

The **CONCATENATE** function or the ampersand symbol, **&**, can be used to join the contents of 2 or more cells.

The **CONCATENATE** function has 1 required argument and up to 255 arguments, all separated by commas. The arguments can be text strings, numbers, or single-cell references.

D2		⋮	×	✓	*fx*	=CONCATENATE(C2," ",B2)

◢	A	B	C	D
1	Salutation	Last Name	First Name	Full Name
2	Miss	Lee	Tina	Tina Lee
3	Mr	Woods	Graham	Graham Woods
4	Mr	Dev	Kiran	Kiran Dev

In the example above, **B2** has the Last Name (Lee), while cell **C2** has the First Name (Tina). The following formula will combine these two in cell **D2**:

=CONCATENATE**(C2," ",B2)**

Notice that **" "** is the second argument, which is a space character, in quotes. You must specify any spaces or punctuation that you want to appear in the results as an argument that is enclosed in quotation marks.

The result is: Tina Lee.

An alternative to the **CONCATENATE** function is the ampersand (**&**) operator, which is easier to use in practice.

D2		⋮	×	✓	*fx*	=C2&" "&B2

◢	A	B	C	D
1	Salutation	Last Name	First Name	Full Name
2	Miss	Lee	Tina	Tina Lee
3	Mr	Woods	Graham	Graham Woods
4	Mr	Dev	Kiran	Kiran Dev

The same formula in cell **D2** using the ampersand operator:

=C2&" "&B2

Extracting Text

The following functions are used to extract parts of text entries:

LEFT	Extracts specified number of characters from the left.
RIGHT	Extracts specified number of characters from the right.
MID	Extracts specified number of characters from the middle

(starting position and number of characters).

	A	B	C	D
1	Product Code	Supplier Code	Production Year	
2	ABC-1232009	ABC	2009	
3	ABC-5402012	ABC	2012	
4	XYZ-7692012	XYZ	2012	
5				
6				
7				

Formula in B2:
=LEFT(A2,3)

Formula in C2:
=RIGHT(A2,4)

Removing Spaces

TRIM is used to tidy up data entry by removing space from any entry leaving only a single space between words.

B2					fx	=TRIM(A2)

	A	B	C
1	Imported Names	Trimmed Name	
2	Alan Phua	Alan Phua	
3	Debbie Chin	Debbie Chin	

Steps

Use **text** functions.

If necessary, open the **Advanced Functions.xlsx** file and display the **Text** worksheet.

Use the CONCATENATE function to combine name parts together with a space in between.

1. Select the cell in which you want the combined text to appear. *The cell is selected.*	Click cell **C4**
2. Type the CONCATENATE function. *The formula appears in the cell and on the formula bar.*	Type **=CONCATENATE(A4," ",B4)**
3. Press [**ENTER**]. *The result of the formula appears in the cell.*	Press [**ENTER**]

Copy the formula to the range C5:C8.

Note: The & operator can be used in place of the CONCATENATE function.

The formula in C4 would be as following:

=A4&" "&B4

Use the TRIM function to remove the extra spaces in the combined name.

1. Select the cell in which you want the **TRIM** function to appear. *The cell is selected.*	Click cell **D4**
2. Type **=TRIM** and an open parenthesis (**(**). *=TRIM(appears in the cell and on the formula bar, and a Screen Tip appears.*	Type **=TRIM(**
3. Select the cell containing the text to remove the extra spaces. *The cell address appears in the cell and on the formula bar.*	Select **C4,**

4. Type a closing parentheses (**)**). *The closing parentheses (**)**) appears in the cell and on the formula bar.*	Type **)**
5. Press [**ENTER**]. *The result of the **TRIM** function appears in the cell.*	Press [**ENTER**]

Copy the **formula** to the cell range **D5:D8**.

9.15 USING A 3-D REFERENCE WITHIN A SUM FUNCTION

Concepts

This is a **running** SUM function which uses data in cells from more than one worksheet.

Steps

Open the **Regional Report.xlsx** file and display the **Combined Totals** worksheet.

1. Select the cell in which you want the result of the running sum function to appear. *The cell is selected.*	Click cell **B3**
2. Enter the beginnings of a SUM function	**=SUM(**
3. Go to the first worksheet that contains data for the SUM function	Select the **Central** worksheet and click on **F22**. In the formula bar you will see **=SUM(Central!F22**
4. Click in the formula bar and add + after F22.	**=SUM(Central!F22+**
5. Go to the second worksheet that contains data for the SUM function	Select the **East** worksheet and click on **F22**. In the formula bar you will see **=SUM(Central!F22+East!F22**
6. Click in the formula bar and add + after F22.	**=SUM(Central!F22+East!F22+**

7. Go to the third worksheet that contains data for the SUM function	Select the **West** worksheet and click on **F22**. In the formula bar you will see **=SUM(Central!F22+East!F22+West!F22**
8. Close the formula with)	**=SUM(Central!F22+East!F22+West!F22)**
9. Go to the Combined Totals worksheet	The 3-D sum results are displayed in **B3**

Close **Regional Report.xlsx.**

9.16 USE MIXED REFERENCES IN FORMULAS

💡 Concepts

A mixed cell reference contains both a relative cell reference and an absolute cell reference. It is either an absolute column (when you add a $ before the column letter) and relative row, or absolute row (when you add a $ before the row number) and relative column.

For example, in =C9*$D2, C9 is relative, but $D2 is mixed, where the column D remains constant but the row 2 can change.

👣 Steps

Open the **Addition Table.xlsx** file and display the **addition** worksheet. You are going to use a mixed reference.

1. Select the cell in which the result of the first addition should appear. The cell is selected.	Click cell **B2**
2. Enter a formula in cell B2 to add the number in A2 and the number in B1. Note: For the formula to copy correctly across the table, the A in A2 must be absolute and the 2 must be relative. The 1 in B1 must be absolute and the B must be relative.	=$A2+B$1
3. Copy the formula down to B5 and across to E8.	

+	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7
4	5	6	7	8

9.17 REVIEW EXERCISE

Using advanced functions

1. Open **Football.xlsx** file and display the **Teams** worksheet.

2. Enter a function in **B4** to remove extra spaces from the player's name in **A4**.

3. Copy the function to the cell range **B5:B15**.

4. In cell **E4**, assign a team to each player based on the **Total Points** column using the lookup table in the cell range **I5:K9**.

5. Copy the function to the cell range **E5:E15**.

6. Enter a function in **F4** to rank each players based on their **Total Points** against the named range **points** in descending order.

7. Copy the function to the cell range **F5:F15**.

8. Enter a function in **G4** to extract the year number from the **Birth Date** in **C4**.

9. Copy the function to the cell range **G5:G15**.

10. Enter a function in **C17** to count the number of players born in the year **1992**.

11. Display the **Performance** worksheet.

12. Enter a nested **IF AND** function in cell **D4** to check whether the **Points** is greater than the **Target Points** and **Attendance %** is greater than or equals the **Target %**, then display **Passed** else display **Failed**.

13. Copy the function to the cell range **D5:D15**.

14. Close the workbook without saving.

LESSON 10 -
USING SCENARIOS

In this section, you will learn about:

- Creating a scenario
- Displaying a scenario
- Editing a scenario
- Creating a scenario summary report
- Working with data tables
- Placing formulas in data tables
- Creating a one-variable table
- Creating a two-variable table

10.1 CREATING A SCENARIO
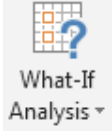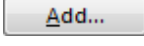
Concepts
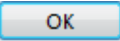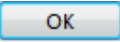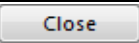
What-if analysis allows you to change the values in cells to see what the impact of these changes is. A scenario is a set of values that can be used in what-if analysis. Excel saves these values and can automatically substitute them into the relevant cells. For example, you could have two different scenarios for predicted sales – weak sales and strong sales. You can switch between these scenarios to see what the impact on profits are.

Steps

Create a scenario.

Open **Scenarios**.xlsx file. The calculations in the **Feb** and **Mar** columns are dependent on the previous month and the growth rate in column **G**. Create scenarios to compare a best and worst case growth rates.

1. Select the desired changing cells. *The cell range is selected.*	Click cell **G4** and press [**CTRL**] and click cell **G12**
2. Select the **DATA** tab. *The **DATA** tab is selected.*	Click **DATA**
3. Select the **What-If Analysis** button in the **Data Tools** group. *The **What-If Analysis** menu opens.*	Click
4. Select the **Scenario Manager** command. *The **Scenario Manager** dialog box opens.*	Click **Scenario Manager**
5. Select **Add**. *The **Scenario Manager** dialog box closes, and the **Add Scenario** dialog box opens with the insertion point in the **Scenario name** box.*	Click

6. Type the desired scenario name. *The text appears in the **Scenario name** box.*	Type **Best Case**
7. Select **OK**. *The **Add Scenario** dialog box closes, and the **Scenario Values** dialog box opens with the text in the first changing cell box selected.*	Click [OK]
8. Type the desired value for the first changing cell. *The value appears in the first box.*	Type **35%**
9. Press [**TAB**] to select the box for the next changing cell. *The second changing cell box is selected.*	Press [**TAB**]
10. Type the desired value for the next changing cell. *The value appears in the second box.*	Type **10%**
11. Once values have been entered for all changing cells, select **OK**. *The **Scenario Values** dialog box closes, and the new scenario appears in the **Scenarios** list box in the **Scenario Manager** dialog box.*	Click [OK]
12. Select **Close**. *The **Scenario Manager** dialog box closes.*	Click [Close]

Practice the concept:

1. Add the following two scenarios, using the same changing cells.

Scenario Name	Changing cell 1 (G4)	Changing cell 2 (G12)
Worst Case	20%	18%
Original	25%	15%
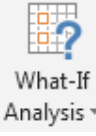
2. When done, close the **Scenario Manager** dialog box.
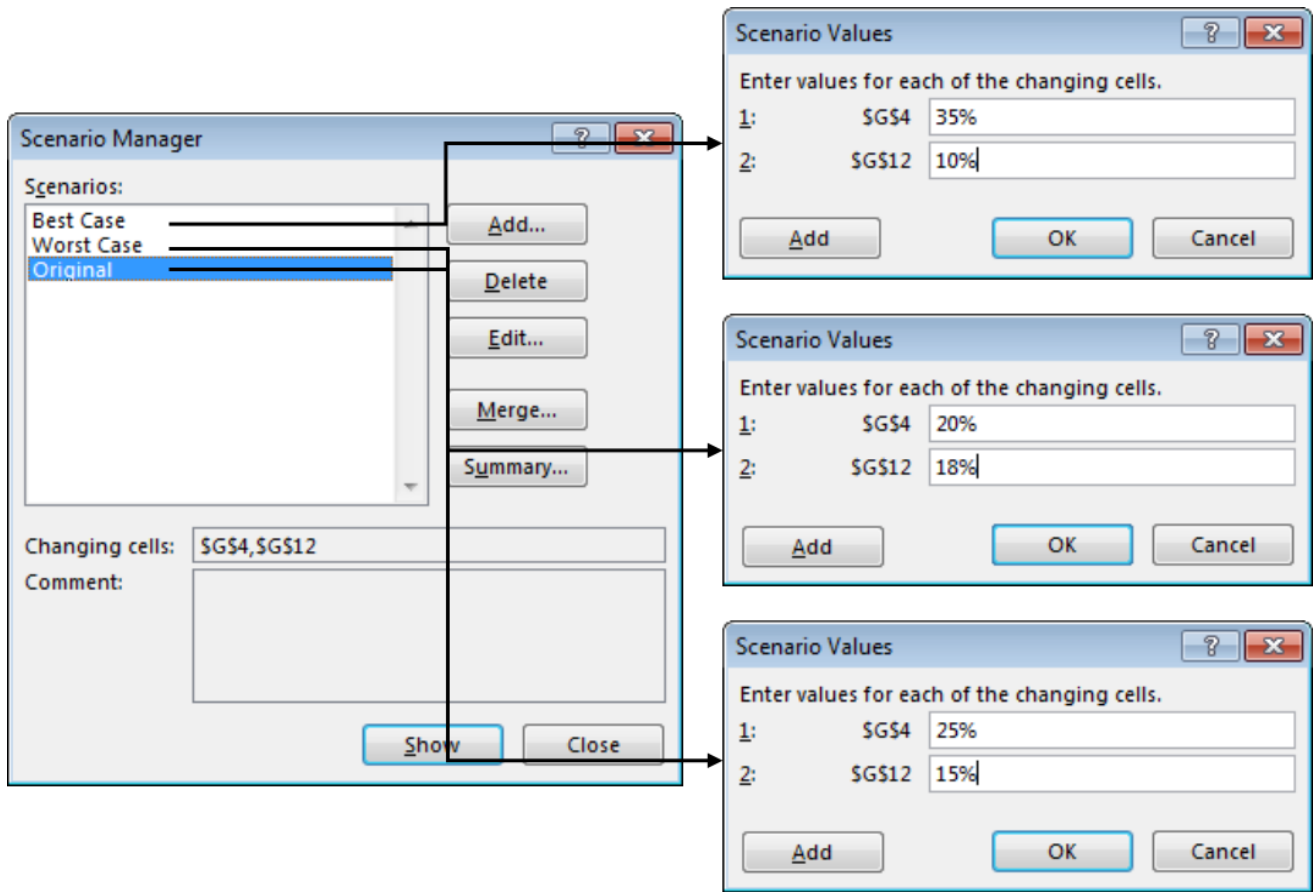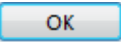
10.2 DISPLAYING A SCENARIO

Steps

Display a scenario.

1. Select the **DATA** tab. *The **DATA** tab is selected.*	Click **DATA**
2. Select the **What-If Analysis** button in the **Data Tools** group. *The **What-If Analysis** menu opens.*	Click
3. Select the **Scenario Manager** command. *The **Scenario Manager** dialog box opens.*	Click **Scenario Manager**

4. Select the scenario you want to view in the **Scenarios** list box. *The scenario is selected.*	Click **Best Case**
5. Select **Show**. *The formulas in the worksheet recalculate.*	Click [Show]

Practice the concept:

1. Show the **Worst Case** scenario.

2. Then, show the **Original** scenario and close the **Scenario Manager** dialog box.
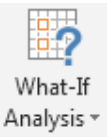
10.3 EDITING A SCENARIO
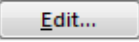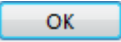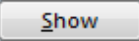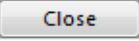
Steps

Edit a scenario.

Edit the **Worst Case** scenario to show a new **Expense Rate** value of **22**%.

1. Select the **DATA** tab. *The DATA tab is selected.*	Click **DATA**
2. Select the **What-If Analysis** button in the **Data Tools** group. *The What-If Analysis menu opens.*	Click What-If Analysis ▾
3. Select the **Scenario Manager** command. *The Scenario Manager dialog box opens.*	Click **Scenario Manager**
4. Select the scenario you want to edit in the **Scenarios** list box. *The scenario is selected.*	Click **Worst Case**

5. Select **Edit**. *The **Scenario Manager** dialog box closes, and the **Edit Scenario** dialog box opens.*	Click [Edit...]
6. Select **OK**. *The **Edit Scenario** dialog box closes, and the **Scenario Values** dialog box opens.*	Click [OK]
7. Select the value in the box of the changing cell you want to edit. *The value in the box is selected.*	Double-click in the second box
8. Type the desired value. *The value appears in the box.*	Type **22**%
9. Select **OK**. *The changes to the scenario are saved, the **Scenario Values** dialog box closes, and the **Scenario Manager** dialog box opens.*	Click [OK]
10. Select **Show** to view the edited scenario. *The formulas in the worksheet recalculate.*	Click [Show]
11. Select **Close**. The **Scenario Manager** dialog box closes.	Click [Close]

10.4 CREATING A SCENARIO SUMMARY REPORT

Concepts
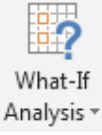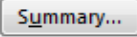
When you generate a scenario summary report, it displays a table in a new worksheet, showing in outline format both the changing cells and result cells for any scenarios stored with the worksheet.
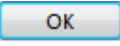
 Steps

Create a scenario summary report.

Create a scenario summary report using the gross profit in row 20 as the result cells.

1. Select the **DATA** tab. *The DATA tab is selected.*	Click **DATA**
2. Select the **What-If Analysis** button in the **Data Tools** group. *The What-If Analysis menu opens.*	 Click **What-If Analysis**
3. Select the **Scenario Manager** command. *The Scenario Manager dialog box opens.*	Click **Scenario Manager**
4. Select **Summary**. *The Scenario Manager dialog box closes, and the Scenario Summary dialog box opens.*	Click **Summary...**
5. Under **Report type**, select the desired option. *The option is selected.*	Click **Scenario summary** if necessary
6. Click the **Collapse Dialog** button in the **Result cells** box. *The Scenario Summary dialog box collapses.*	Click **Result cells**
7. Select the cells you want to display in the scenario summary report. *The cells are selected and the range appears in the collapsed Scenario Summary dialog box.*	Select cells **B20:E20**

8. Click the **Expand Dialog** button. *The **Scenario Summary** dialog box expands.*	Click
9. Select **OK**. *The **Scenario Summary** dialog box closes, and the scenario summary report appears on a new **Scenario Summary** sheet in the workbook.*	Click OK

After you have finished viewing the scenario summary report, display the Sheet1 worksheet.

Note: Scenario reports are not automatically recalculated. If you change the values of a scenario, those changes will not show up in an existing summary report. Instead, you must create a new summary report.

Close **Scenarios.xlsx** without saving.

10.5 WORKING WITH DATA TABLES

Concepts

Using a data table is a way to see what happens when one or two variables are changed in your formulas. It shows how small changes made to input variables can affect the result of the formulas that use those input variables.

To create a data table, you must first indicate the input cells (the cells containing the variable values in the formula). The input values are then substituted in the formula and the result of each calculation is placed into an output cell in the data table.

10.6 PLACING FORMULAS IN DATA TABLES

Concepts

There are two varieties of data table:

1. **The One-Variable Data Table**

2. **The Two-Variable Data Table**

Both varieties have similar characteristics. In order to ensure that the data tables work efficiently, you have to identify the key input variables in your worksheet and list the range of values that you want the input variables to work on. Furthermore, identify those base formulas that are dependent on the respective inputs.

The placement of the formula used in the calculation depends on the type of data table you are creating.

If a one-variable data table is arranged in columns (vertically), the formula used in the calculation is placed in the cell at the top of the output column. In the following diagram, column B is the output column and the formula must be placed in cell B1.

	A	B
1		FORMULA
2		
3	INPUT VALUES	
4		
5		
6		

If a one-variable data table is arranged in rows (horizontally), the formula used in the calculation is placed in the cell to the left of the output row. In the following diagram, row 2 is the output row and the formula must be placed in cell A2.

	A	B	C	D	E	F	G
1				INPUT VALUES			
2	FORMULA						

In a two-variable data table, both rows and column are used for input data, and the formula used in the calculations must be placed above the column input cells and to the left of the row input cells.

In the following diagram, column A contains one set of variable input values and row 1 contains the other set of input values. Therefore, the formula must be placed in cell A1.

	A	B	C	D	E	F	G
1	FORMULA			INPUT VALUES			
2							
3	INPUT VALUES						
4							
5							
6							

10.7 CREATING A ONE-VARIABLE TABLE

Concepts

A one-variable data table has input values that are listed either down a column (vertically) or across a row (horizontally). Formulas that are used in a one-variable data table must refer to only one input cell.
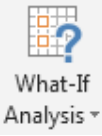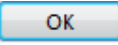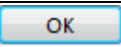
Steps

Create a one-variable data table.

Open the **Data Tables.xlsx** file. Display the **One-Variable** worksheet. The **Projected Revenue** amount in cell **B6** is calculated by adding last year's revenue total in cell **B3** to the amount that it is expected to grow for current year in cell **B4**.

Generate a data table to show the changes in the **Projected Revenue** based on the **Growth %** input values.

1. Select the cell immediately above the output column or to the left of the output row. *The cell is selected.*	Click cell **B8**
2. Type the formula you want to evaluate or link to the cell containing the formula. *The formula appears in the cell and on the formula bar.*	Type **=B6**

3. Press [**ENTER**]. *The result of the formula appears in the cell.*	Press [**ENTER**]
4. Select the entire cell range containing the formula, the input column/row, and the output column/row. *The cell range is selected.*	Select cells **A8:B19**
5. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
6. Select the **What-If Analysis** button in the **Data Tools** group. *The **What-If Analysis** menu opens.*	Click
7. Select the **Data Table** command. *The **Data Table** dialog box opens.*	Click **Data Table**
8. Select the **Row input cell** box or the **Column input cell** box, as necessary. *The insertion point appears in the selected box.*	Click in the **Column input cell** box
9. Select the input cell. *The cell is selected and appears in the appropriate input cell box.*	Click cell **B4**
10. Select **OK**. *The **Data Table** dialog box closes, and the data table appears in the selected range.*	Click

10.8 CREATING A TWO-VARIABLE TABLE

Concepts
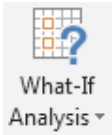
A two-variable data table uses a formula that contains two series of input values. The formula must refer to two different input cells.

 Steps

Create a two-variable data table.

If necessary open the **Data Tables.xlsx** file. Display the **Two-Variable** worksheet. The **Projected Revenue** amount in cell **B6** is calculated using two variables: a growth rate percentage (**B3**) and expenses (**B4)**.

Generate a data table to show the changes in the **Projected Revenue** based on the **Growth %** and **Expenses** input values.

1. Select the cell immediately above the output column and to the left of the output row. *The cell is selected.*	Click cell **A8**
2. Type the formula you want to evaluate or link to the cell containing the formula. *The formula appears in the cell and on the formula bar.*	Type **=B6**
3. Press [**ENTER**]. *The result of the formula appears in the cell.*	Press [**ENTER**]
4. Select the entire data table range. *The cell range is selected.*	Select cells **A8:F19**
5. Select the **DATA** tab. *The **DATA** tab is displayed.*	Click **DATA**
6. Select the **What-If Analysis** button in the **Data Tools** group. *The **What-If Analysis** menu opens.*	Click
7. Select the **Data Table** command. *The **Data Table** dialog box opens.*	Click **Data Table**
8. Select the row input cell. *The cell is selected and appears in the **Row input cell** box.*	Click cell **B5**

9. Select the **Column input cell** box. *The insertion point appears in the* ***Column input cell*** *box.*	Press [**TAB**]
10. Select the column input cell. *The cell is selected and appears in the* ***Column input cell*** *box.*	Click cell **B4**
11. Select **OK**. *The* ***Data Table*** *dialog box closes, and the two-variable data table is created.*	Click OK

Close **Data Tables.xlsx** file.

10.9 REVIEW EXERCISE

Using the Scenario Manager and data tables

1. Open **Projections.xlsx** file.

2. Create a scenario named **Low Season**. Make **B4:B7** the changing cells and accept the default values.

3. Create two more scenarios named **Peak Season** and **Summer Holidays** with the following changing cells and values:

Changing Cells	Peak Season	Summer Holidays
B4	125	160
B5	80	100
B6	55	10
B7	70	0

4. Show the **Peak Season** scenario.

5. Edit the **Peak Season** scenario, set the changing value of the cell **B4** to **135** and cell **B5** to **90**.

6. Select the range **A4:B7** and create range names for each cell from the row headings.

7. Use the **Name Box** to name cell **D8** as **Total_Revenue**.

8. Create a scenario summary report using the result cell **D8**. Then, display the **Sheet1** worksheet.

9. Open **Prices.xlsx** file.

10. In cell **E3**, enter a formula to link to the **Gross Profit** in **B11**.

11. Create a one-variable data table in the range **D3:E11**. The column input cell is the **Price** in **B3**.

12. In cell **G3**, enter a formula to link to the **Gross Profit** in **B11**.

13. Create a two-variable data table in the range **G3:L11**. The row input cell is the **No. of add-ons** in **B4** and the column input cell is the **Price** in **B3**.

14. Select **Commission** worksheet, create a mixed referencing formula to calculate the commission amount on cell **B5**. (Hint: *=B$4*$A5)*

15. Copy the formula from cell **B5** to range **C5:F5**.

16. Close all the workbooks without saving.

LESSON 11 -
USING WORKSHEET PROTECTION

In this section, you will learn about:

- Unlocking cells in a worksheet
- Protecting a worksheet
- Unprotecting a worksheet
- Creating allow-editing ranges
- Deleting allow-editing ranges
- Assigning a password
- Opening a password-protected file
- Removing a password

11.1 UNLOCKING CELLS IN WORKSHEET
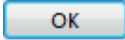
Concepts

By default, all the cells in the worksheet are locked when you password protect a worksheet. In order to edit cells in a protected worksheet, you must unlock those cells you wish to edit before you apply protection.

Steps

Unlock cells in a worksheet.

Open the **Car Claims.xlsx** file.

1. Select the cells you want to unlock. *The cells are selected.*	Select cells **A8:C14** and **F8:G14**
2. Right-click on any of the selected cell and click on **Format Cells** command. *The **Format Cells** dialog box is displayed.*	Right-click on any of the selected range and choose **Format Cells** from the shortcut menu
3. Select the **Protection** tab. *The **Protection** page is displayed.*	Click **Protection**
4. Uncheck the **Locked** option. *The **Locked** option is deselected.*	Click ☑ Locked
5. Select **OK**. *The **Format Cells** dialog box closes, and the selected cell range are unlocked.*	Click OK

Close the **Car Claims.xlsx** file and do not save.

11.2 HIDE, UNHIDE FORMULAS

Concepts

Use the Hidden option to hide and protect formulas from being viewed in worksheet cells and in the formula bar at the top of the worksheet.

Steps

Open the **Car Claims.xlsx** file.

To Hide Formulas

1. To select the entire worksheet click the **Select All** button in the upper left-hand corner of the worksheet. *The entire worksheet is selected.*	Click **Select All**
2. Right-click any cell in the worksheet, and then select **Format Cells**. *The Format Cells dialog box is displayed.*	Right-click any cell in the worksheet, and click **Format Cells**.
3. Select the **Protection** tab, and clear the **Locked** checkbox and Click **OK**. *The Format Cells dialog box closes.*	Click the **Protection** tab, click the **Locked** checkbox, and click **OK**.
4. Select the range of cells with formulas to hide.	Select **E15:G15**
5. Right-click the selected cells, and then select **Format Cells**.	
6. Select the **Protection** tab, and check the **Locked** and the **Hidden** checkboxes. Click **OK**. *The Format Cells dialog box closes.*	Click the **Protection** tab, click the **Locked** checkbox, and click **OK**.

7. On the REVIEW tab in the **Changes** group, select **Protect Sheet** and make sure the **Protect worksheet and contents of locked cells** check box is selected. You may enter a password, but for this exercise do NOT enter a password. Click OK.	Click **Protect Sheet**, and check that **Protect worksheet and contents of locked cells** is selected

To Unhide Formulas

1. Select the **REVIEW** tab. *The REVIEW tab is displayed.*	Click **REVIEW**
2. Select **Unprotect Sheet** in the **Changes** group.	Click **Unprotect Sheet**
3. Select the range of cells with formulas to unhide	Select **E15:G15**
4. Right-click the range of cells, and then select **Format Cells**.	Click **Format Cells**
5. On the **Protection** tab, clear the **Hidden** check box. Click **OK**.	Click the **Hidden** check box, and click **OK**.

Close the **Car Claims.xlsx** file and do not save.

11.3 PROTECTING A WORKSHEET
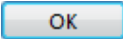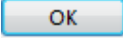
👣 Steps

Protect a worksheet.

If necessary, open the **Car Claims.xlsx** file and unlock the cell range **A8:C14** and **F8:G14**.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Protect Sheet** button in the **Changes** group. *The **Protect Sheet** dialog box opens with the insertion point in the **Password to unprotect sheet** box.*	Click
3. Type a password, if desired. *Black dots appear in the **Password to unprotect sheet** box representing each character you type.*	Type **claims**

4. Select **OK**. *If you typed a password, the **Confirm Password** dialog box opens with the insertion point in the **Reenter password to proceed** box.*	Click OK
5. Type the password again, if necessary. *Black dots appear in the **Reenter password to proceed** box representing each character you type.*	Type **claims**
6. Select **OK** if necessary. *The **Confirm Password** and the **Protect Sheet** dialog boxes close, and the worksheet is protected.*	Click OK

Select cell **D8** and type any number. A Microsoft Office Excel warning box opens, informing you that the cell is protected and you cannot edit it. Close the warning box.
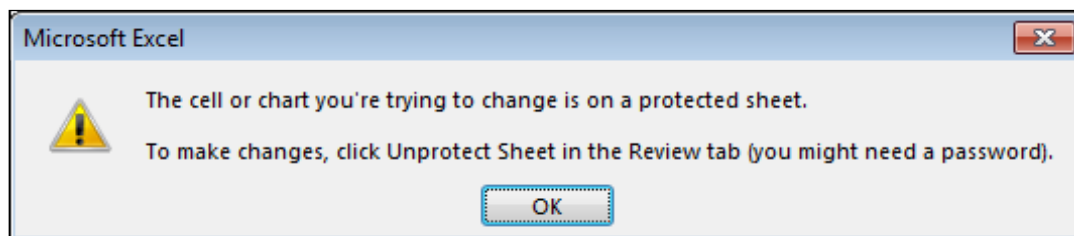
Type **5** in cell **G8** and **4** in cell **G14**. Notice that you can change the content of these cells since they are unlocked.
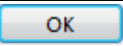
11.4 UNPROTECTING A WORKSHEET

Steps

Unprotect a worksheet.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**

2. Select the **Unprotect Sheet** button in the **Changes** group. *The **Protect Sheet** dialog box opens with the insertion point in the **Password to unprotect sheet** box.*	Click
3. Type the required password, if necessary. *Black dots appear in the **Password** box representing each character you type.*	Type **claims**
4. Select **OK**. *The **Unprotect Sheet** dialog box closes, and the worksheet is unprotected.*	Click OK

Select cell **D8** and type any number. Notice that, since the worksheet is now unprotected, you can type in the cell. Undo the data entry.
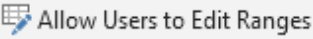
11.5 CREATING ALLOW-EDITING RANGES

Concepts
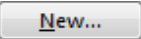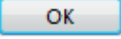
You can use the **Allow Users to Edit Ranges** feature to allow particular users to edit one or more specified cell ranges that are locked within a worksheet. To do this a cell range is selected and its cells locked and then given a password. When worksheet protection is turned on users will need to enter the correct password to edit a locked cell range.
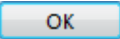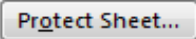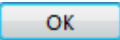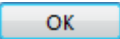
Steps

Create allow-editing ranges in a worksheet.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Allow Users to Edit Ranges** button in the **Changes** group. *The **Allow Users to Edit Ranges** dialog box opens.*	Click Allow Users to Edit Ranges

3. Select the **New** button. *The **New Range** dialog box opens with the text in the Title box selected.*	Click New...
4. Enter a name for the allow-editing range in the **Title** box, if desired. *The name appears in the **Title** box.*	Type **rate**
5. Click the **Collapse Dialog** button in the **Refers to cells** box. *The **New Range** dialog box collapses so that you can access the worksheet.*	Click **Refers to cells** 📇
6. Select the range in which you want to allow editing. *The range is selected.*	Select **C3**
7. Click the **Expand Dialog** button in the **New Range** dialog box. *The name appears in the **Title** box.*	Click 📇
8. Select the **Range password** box. *The insertion point appears in the **Range password** box.*	Click in the **Range password** box
9. Type the desired password. *Black dots appear in the **Range password** box representing each character you type.*	Type **123**
10. Select **OK**. *The **Confirm Password** dialog box opens with the insertion point in the **Reenter password to proceed** box.*	Click OK
11. Type the password again. *Black dots appear in the **Reenter password to proceed** box representing each character you type.*	Type **123**

12. Select **OK**. *The **Confirm Password** and **New Range** dialog boxes close, and the new range name and reference appear in the **Allow Users to Edit Ranges** dialog box.*	Click OK
13. Select the **Protect Sheet** button and type the desired password. *The **Protect Sheet** dialog box opens with the insertion point in the **Password to unprotect sheet** box and black dots appear representing each character you type*	Click Protect Sheet... and type **claims**
14. Select **OK** and type the password again. *The **Confirm Password** dialog box opens with the insertion point in the **Reenter password to proceed** box and black dots appear representing each character you type.*	Click OK and type **claims**
15. Select **OK**. *The **Confirm Password** and the **Protect Sheet** dialog boxes close, and the allow-editing range in the worksheet is protected.*	Click OK

Select cell **C3** and type **0**. The **Unlock Range** dialog box opens with the insertion point in the **Enter the password to change this cell** box. Type the password **123** and select **OK** to close the dialog box. Then, type **0.65** in cell **C3**. Notice that you can now edit cell **C3** because the allow-editing range has been unlocked.
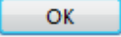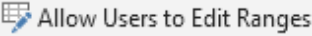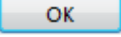
11.6 DELETING ALLOW-EDITING RANGES

Steps

Delete allow-editing ranges in a worksheet.
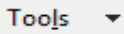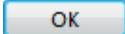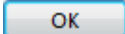
1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
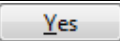
2. Select the **Unprotect Sheet** button in the **Changes** group. *The **Unprotect Sheet** dialog box opens.*	Click Unprotect Sheet
3. Type the required password. *Black dots appear in the **Password** box representing each character you type.*	Type **claims**
4. Select **OK**. *The **Unprotect Sheet** dialog box closes and the password protection is removed from the worksheet.*	Click OK
5. Select the **Allow Users to Edit Ranges** button in the **Changes** group. *The **Allow Users to Edit Ranges** dialog box opens.*	Click Allow Users to Edit Ranges
6. Select the range you want to delete from the **Ranges unlocked by a password when sheet is protected** box. *The range is selected.*	Click **rate**
7. Select the **Delete** button. *The range is removed.*	Click Delete
8. Select **OK**. *The **Allow Users to Edit Ranges** dialog box closes.*	Click OK

11.7 ASSIGNING A PASSWORD

 Steps

Assign a password to open or modify a file.

1. Press the function key [**F12**] and select the **Tools** button. *The **Save As** dialog box opens.*	Press [**F12**] and click Tools ▾
2. Select the **General Options** option. *The **General Options** dialog box opens with the insertion point in the **Password to open** box.* ***OR*** *Tab to the **Password to modify** box if you wish to password protect the document so that it cannot be modified unless the correct password is entered.*	Click **General Options**
3. Type the desired password. *Black dots appear in the **Password to open** box representing each character you type.*	Type **claims**
4. Select **OK**. *The **Confirm Password** dialog box opens with the insertion point in the **Reenter password to proceed** box.*	Click OK
5. Type the password again. *Black dots appear in the **Reenter password to proceed** box representing each character you type.*	Type **claims**
6. Select **OK**. *The **Confirm Password** and **General Options** dialog box close.*	Click OK
7. Select **Save**. *A Microsoft Office Excel warning box opens, prompting you to overwrite the existing file.*	Click Save

| 8. Select **Yes**.

The Microsoft Office Excel warning box and the Save As dialog box close, and the file is saved with the assigned password. | Click [Yes] |

Close the **Car Claims.xlsx** file.
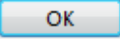
11.8 OPENING A PASSWORD-PROTECTED FILE

👣 Steps

Open a password-protected file.

Open the **Car Claims.xlsx** file. The Password dialog box opens with the insertion point in the Password box.

| 1. Type the required password.

Black dots appear in the Password box representing each character you type. | Type **claims** |
| 2. Select **OK**.

The Password dialog box closes, and the file opens. | Click [OK] |
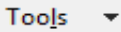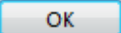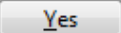
The file opens.

11.9 REMOVING A PASSWORD

👣 Steps

Remove a password to open or modify a file.

If necessary, open the **Car Claims.xlsx** file and type claims in the **Password** dialog box to open the file.

1. Press the function key [**F12**].	Press [**F12**].
*The **Save As** dialog box opens.*	
2. Select the **Tools** button.	Click Tools ▾
*The **Tools** menu opens.*	
3. Select the **General Options** option.	Click **General Options**
*The **General Options** dialog box opens with the current password selected. Each black dot represents a character in the password.*	
4. Press [**DELETE**] to remove the current password.	Press [**DELETE**]
The password is deleted.	
5. Select **OK**.	Click OK
*The **General Options** dialog box closes.*	
6. Select **Save**.	Click Save
A Microsoft Office Excel warning box opens, prompting you to overwrite the existing file.	
7. Select **Yes**.	Click Yes
*The Microsoft Office Excel warning box and the **Save As** dialog box close, and the file is saved without a password.*	

Close the **Car Claims.xlsx** file.

11.10 REVIEW EXERCISE

Using worksheet protection

1. Open **Revenues.xlsx** file.

2. Unlock the cell range **C4:C8**.

3. Apply worksheet protection using the password **money**.

4. Assign a password to open the workbook; type **secret** as the password. Then, save and close the workbook.

5. Reopen the **Revenues.xlsx** file. Notice that you must enter the assigned password.

6. Remove the password from the workbook.

7. Close the workbook without saving it.

LESSON 12 -
TRACKING AND MERGING WORKBOOKS

In this section, you will learn about:

- Saving a shared workbook

- Viewing users sharing a workbook

- Viewing shared workbook changes

- Changing the update frequency

- Highlighting changes

- Managing conflicting changes

- Resolving conflicting changes

- Set change history options

- Adding a history worksheet

- Reviewing tracked changes

- Merging shared workbook files

12.1 SAVING A SHARED WORKBOOK
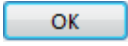
Steps
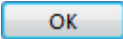
Save a workbook as a shared file.

Open the **Donation.xlsx** file.

Select the **FILE** tab and click **Options**. In the **Trust Center** category, click the **Trust Center Settings** button. In the **Privacy Options** category, ensure the **Remove personal information from file properties on save** option is not checked.

Click **OK** to close the **Trust Center** dialog box and the click **OK** to close the **Excel Options** dialog box.

1. Select the **REVIEW** tab. *The REVIEW tab is displayed.*	Click **REVIEW**
2. Select the **Share Workbook** button in the **Changes** group. *The Share Workbook dialog box opens.*	Click ⊞ Share Workbook
3. Select the **Editing** tab, if necessary. *The Editing page is displayed.*	Click the **Editing** tab, if necessary
4. Select the **Allow changes by more than one user at the same time ...** option. *The Allow changes by more than one user at the same time ... option is selected.*	Check the option ☐ Allow changes by more than one user at the same time. This also allows workbook merging.
5. Select **OK**. *The Share Workbook dialog box closes, and a Microsoft Office Excel warning box opens, prompting you to verify the save.*	Click [OK]

6. Select **OK**. *The Microsoft Office Excel warning box closes, and the workbook is saved as a shared file.*	Click [OK]

Notice that the text [**Shared**] appears on the title bar.
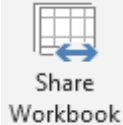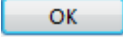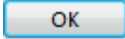
Close the **Donation.xlsx** file.

12.2 VIEWING USERS SHARING A WORKBOOK

Steps

View the users sharing a workbook.

Note: Learners should pair off to share a single workbook. If necessary, copy the shared **Donation2.xlsx** file from the Student Folder to a shared folder that both learners can access. Both learners should open the same **Donation2.xlsx** workbook.

1. Select the **REVIEW** tab. *The REVIEW tab is displayed.*	Click **REVIEW**
2. Select the **Share Workbook** button in the **Changes** group. *The Share Workbook dialog box opens.*	Click Share Workbook
3. Select the **Editing** tab, if necessary. *The Editing page is displayed with the current users listed in the Who has this workbook open now.*	Click the **Editing** tab, if necessary
4. Select **OK**. *The Share Workbook dialog box closes.*	Click [OK]

12.3 VIEWING SHARED WORKBOOK CHANGES
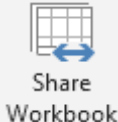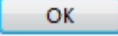
Steps

View the shared working changes.

One learner from each pair should now change the data in cell **C6** to **35000** and save the workbook file. The other learner then performs the following steps:

1. Click the **Save** button on the **Quick Access Toolbar**. *If the shared file has been changed by another user, a Microsoft Office Excel message box informs you that it has been changed.*	Click 💾
2. Select **OK**. *The changed cells appear with an indicator in the upper left corner and a colored border around each cell.*	Click OK
3. Point to any cell with a colored border and a comment mark. *The comment appears.*	Point to **C6**

Practice the concept:

The learners in each pair should now reverse roles.

One learner from each pair should now change the data in cell C7 to 80000 and save the workbook file.

The other student then performs the above steps.

12.4 CHANGING THE UPDATE FREQUENCY

Steps

Change the update frequency for a shared workbook.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Share Workbook** button in the **Changes** group. *The **Share Workbook** dialog box opens.*	Click
3. Select the **Advanced** tab. *The **Advanced** page is displayed.*	Click **Advanced**
4. Under **Update changes**, select the **Automatically every** option. *The **Automatically every** option is selected and the **minutes** spin box is activated.*	Click
5. Enter the time interval in the **minutes** spin box at which you want changes to appear in the open workbook. *The number appears in the **minutes** spin box.*	Type **30**
6. Select other options as desired. *The options are selected.*	Click
7. Select **OK**. *The **Share Workbook** dialog box closes, and the new update frequency is saved.*	Click

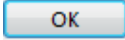# 12.5 HIGHLIGHTING CHANGES

This option is used to keep track of any changes made to a spreadsheet that is shared with a number of people. You can track when changes were made, who made the changes, where the changes were made and what the changes are.

Steps

Highlight changes in the shared workbook.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Track Changes** button in the **Changes** group. *The **Track Changes** menu opens.*	Click Track Changes
3. Select the **Highlight Changes** option. *The **Highlight Changes** dialog box opens.*	Click **Highlight Changes**
4. Select the **When** list and select the desired option. • **All** – This means that every change will be highlighted. • Since **I last saved –** only changes from the last time the spreadsheet was saved. • Not **yet reviewed –** Changes that have not yet been reviewed. • **Since date** – you can specify a date. *The selected option appears in the **When** box.*	Click **When** ▾ and click **All**
5. Select the **Who** list and select the desired option. Note You can choose to track changes made by everyone or changes made by everyone except for any changes you made. *The selected option appears in the **Who** box.*	Click **Who** ▾ and click **Everyone**
6. Click the **Collapse Dialog** button in the **Where** box. Note This option allows you to track changes only for a specific portion of the spreadsheet which you can select. *The **Highlight Changes** dialog box collapses.*	Click **Where**

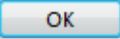| 7. Select the range in which you want to view changes. *The range is selected.*	Select cell range **B4:C11**
8. Click the **Expand Dialog** button. *The dialog box expands and the selected range appears in the **Where** box.*	Click 🔲
9. Select the **Highlight changes on screen** option, if necessary. Note When this option is selected any changed cell will show a small arrow at the top left, to show it was changed. Also when you click on a changed cell a small window appears showing the original data and the change made. *The **Highlight changes** on screen option is selected.*	Click 🔲 **Highlight changes on screen**, if necessary
10. Select **OK**. *The **Highlight Changes** dialog box closes, and all changed cells in the defined range are outlined in varying colors, according to the user who made the change.*	Click OK

12.6 MANAGING CONFLICTING CHANGES

Steps

Highlight conflicting changes.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Share Workbook** button in the **Changes** group. *The **Share Workbook** dialog box opens.*	Click Share Workbook

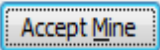| 3. Select the **Advanced** tab. *The **Advanced** page is displayed.*	Click **Advanced**
4. Under **Conflicting changes between users**, select the desired option. *The option is selected.*	Click ⦿ A<u>s</u>k me which changes win
5. Select **OK**. *The **Share Workbook** dialog box closes, and the conflicting change option is saved.*	Click [OK]

Save the workbook.

12.7 RESOLVING CONFLICTING CHANGES

👣 Steps

Resolve conflicting changes.

In each learner pair, one learner should now change the goal in cell B9 to 28000 and save the shared workbook.

The second learner should then change the goal in cell B9 to 30000 and save the file. The Resolve Conflicts dialog box will open when the second student saves the workbook.
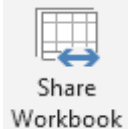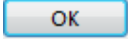

1. Select **Accept Mine** or **Accept Other** in the **Resolve Conflicts** dialog box, as appropriate. *If there are no additional conflicting changes, your changes are saved and the **Resolve Conflicts** dialog box closes.*	Click [Accept Mine]

12.8 SETTING CHANGE HISTORY OPTIONS

🦶 Steps

Set change history options.

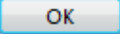|	
1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Share Workbook** button in the **Changes** group. *The **Share Workbook** dialog box opens.*	Click
3. Select the **Advanced** tab. *The **Advanced** page is displayed.*	Click **Advanced**
4. Under **Track changes**, select the **Keep change history for** option. *The **Keep change history for** option is selected.*	Click 🔘 Keep change history for:
5. Enter the number of days you want to maintain the change history in the **days** spin box. *The number appears in the **days** spin box.*	Click days 🔼 to **20**
6. Select **OK**. *The **Share Workbook** dialog box closes, and the change history options are saved.*	Click OK

12.9 ADDING A HISTORY WORKSHEET

Steps

Highlight changes in the shared workbook.
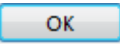
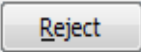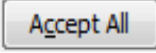|	
1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Track Changes** button in the **Changes** group. *The **Track Changes** menu opens.*	Click 🖹 Track Changes ▾
3. Select the **Highlight Changes** option. *The **Highlight Changes** dialog box opens.*	Click **Highlight Changes**
4. Select the **Track changes while editing...** option, if necessary. *The **Track changes while editing ...** option is selected.*	Click ☐ Highlight changes on screen, if necessary
5. Select the **List changes on a new sheet** option. *The **List changes on a new sheet** option is selected.*	Click ☐ List changes on a new sheet, if necessary
6. Select **OK**. *The **Highlight Changes** dialog box closes, and a **History** worksheet is added to the workbook.*	Click OK

12.10 REVIEWING TRACKED CHANGES

Steps

Review tracked changes.

1. Select the **REVIEW** tab. *The **REVIEW** tab is displayed.*	Click **REVIEW**
2. Select the **Track Changes** button in the **Changes** group. *The **Track Changes** menu opens.*	Click Track Changes ▾
3. Select the **Accept/Reject Changes** option. *The **Select Changes to Accept or Reject** dialog box opens.*	Click **Accept/Reject Changes**
4. Select the **When** list and select the desired option. *The selected option appears in the **When** box.*	Click **When** ▾ and click **Not yet reviewed**
5. Select the **Who** list and select the desired option. *The selected option appears in the **Who** box.*	Click **Who** ▾ and click **Everyone**
6. Click the **Collapse Dialog** button in the **Where** box. *The dialog box collapses.*	Click **Where**
7. Select the desired range. *The range is selected.*	Select cell range **B4:C11**
8. Click the **Expand Dialog** button. *The dialog box expands and the selected range appears in the **Where** box.*	Click
9. Select **OK**. *The dialog box closes, and the **Accept or Reject Changes** dialog box opens with the first change displayed.*	Click OK

| 10. Select **Accept**, **Reject**, **Accept All**, or **Reject All**, as desired.

The change is accepted or rejected, and the next change is displayed. | Click [Reject] |
| 11. Accept or reject any remaining changes, if necessary.

The dialog box closes when all changes have been reviewed. | Click [Accept All] |

Close the **Donation2.xlsx** file.
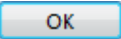
12.11 MERGING SHARED WORKBOOK FILES

Steps

Merge shared workbook files.

Open the **DonationA.xlsx** file.

If necessary, add the **Compare and Merge Workbooks** button to the **Quick Access Toolbar**.

1. Select the **Compare and Merge Workbooks** button on the **Quick Access Toolbar**. *The Select Files to Merge Into Current Workbook dialog box opens.*	Click ◯
2. Select the workbook you want to merge. *The file name is selected.*	Click **DonationB** inside the **Student Folder**
3. To merge additional workbooks, hold [**CTRL**] and select the other workbooks you want to merge.	Hold [**CTRL**] and click **DonationC**
4. Select OK. *The Select Files to Merge Into Current Workbook dialog box closes, and all selected workbooks are merged into the current workbook.*	Click [OK]

Open the **Highlight Changes** dialog box (select the **Highlight Changes** option from the **Track Changes** menu). Enable change tracking for all changes made by everyone (set the **When** to **All** and the **Who** to **Everyone**).

Notice that all cells changed by the merge are outlined and have change indicators; three of the blank cells in the **Raised** column has been entered with values and two new region and goal has been added.

Open the **Accept or Reject Changes** dialog box (select the **Accept or Reject Changes** option from the **Track Changes** menu and select **OK** to review the changes that were not yet reviewed by everyone). Reject the first three changes then accept all changes.

Close the **DonationA.xlsx** file.

12.12 REVIEW EXERCISE

Tracking and merging workbooks

1. Open the **Membership.xlsx** file.

2. Ensure the **Remove personal information from file properties on save** option is not checked.

    - Select the **FILE** tab and click **Options**.

    - In the **Trust Center** category, click the **Trust Center Settings** button.

    - In the **Privacy Options** category, ensure the **Remove personal information from file properties on save** option is not checked.

    - Click OK as necessary to close the dialog boxes

3. Share the workbook and select options to automatically update changes every 15 minutes, to keep the change history for 60 days, and to review conflicting changes.

4. Close the **Membership.xlsx** file.

5. Open the **Membership2.xlsx** file.

6. Use the track changes feature to reject the change in cell **B10** and accept all other changes that have been tracked and changed in the worksheet.

7. Turn off the track changes while editing feature, removing the workbook from shared use.

8. Close the **Membership2.xlsx** file.

9. Open the **Appointments.xlsx** file.

10. Merge the **Updated Appointments.xlsx** file into **Appointments.xlsx** file.

11. Add a **History** worksheet to the workbook, for all changes made by all users. Then, review the **History** worksheet.

12. Close the workbook without saving it.

LESSON 13 - RECORDING MACROS

In this section, you will learn about:

- Recording a macro
- Saving a macro-enabled workbook
- Running a macro
- Assigning a shortcut key
- Using a shortcut key
- Deleting a macro
- Adding a macro to Quick Access Toolbar
- Deleting a macro button from Quick Access Toolbar

13.1 RECORDING A MACRO

💡 Concepts

Recording a macro will record all the steps in a task as they are carried out by you within the spreadsheet. When the task is finished you stop the macro recording. The macro is given a descriptive name and saved. To run the same task again, just click on the saved macro and it will quickly automatically execute all the steps necessary to run the task. The macro feature is most useful for recording repetitive tasks that need to be run many times or for such tasks as changing page setup, applying a custom number format, applying autoformats to a cell range, or inserting fields in worksheet header, footer
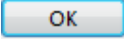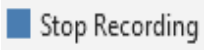
👣 Steps

Record a macro.

Open the **Invoice.xlsx** file. Record a macro that inserts current date formatted in bold and italic. Ensure the **DEVELOPER** tab is activated.

1. Select a cell to record the macro. *The cell is selected.*	Select cell **F4**
2. Select the **DEVELOPER** tab on the **Ribbon**. *The DEVELOPER tab is displayed.*	Click **DEVELOPER**
3. Select the **Record Macro** button in the **Code** group. *The Record Macro dialog box opens and the suggested text in the Macro name box is highlighted.*	Click Record Macro
4. Type the desired macro name. *The text appears in the Macro name box.*	Type **Current_Date**.
5. Select the **Shortcut key** box, if desired. *The insertion point is placed in the Shortcut key box.*	Press [**TAB**]

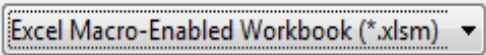|	
6. Type the desired shortcut key character. *The character appears in the **Shortcut key** box.*	Type **e**
7. Select the **Store macro in** list. *A list of available options is displayed.*	Click **Store macro in**
8. Select the desired location in which to store the macro. *The location appears in the **Store macro in** box.*	Click **This Workbook**
9. Select the **Description** box. *The insertion point is placed in the **Description** box.*	Press [**TAB**]
10. Type the desired macro description. *The text appears in the **Description** box.*	Type **Inserts current date**
11. Select **OK**. *The **Record Macro** dialog box closes. The **Record Macro** button in the **Code** group changes to the **Stop Recording** button and a **Stop Recording** button is also displayed on the status bar.*	Click
12. Perform the steps in the procedure that you want to automate. *The procedure is carried out and recorded.*	• Type **=TODAY()** and press [**CTRL ENTER**] • In the **HOME** tab, click on **Bold** button in the **Font** group • In the **HOME** tab, click on **Italic** button in the **Font** group
13. When you have finished recording macro steps, click the **Stop Recording** button in the **Code** group. *The macro recorder stops. The **Record Macro** button displays again and the macro recording is complete.*	Click

13.2 SAVING A MACRO-ENABLED WORKBOOK

Concepts

Workbooks containing macros must be saved as macro-enabled workbooks. This allows for easier identification of files that contain macros. The file extension for macro enabled workbooks is **xlsm**.

Steps

Save a file as a macro-enabled workbook.

Open the **Invoice.xlsx** file. Record a macro that inserts current date formatted in bold and italic.

1. Press [**F12**]. *The **Save As** dialog box appears.*	Press **F12**
2. Select **Excel Macro-Enabled Workbook** from the **Save as** drop down list. *The **Save as** is set to **Excel Macro-Enabled Workbook**.*	Click `Excel Macro-Enabled Workbook (*.xlsm) ▼`
3. Enter the filename for the workbook. *The file name appears in the **File name** box.*	Type **DateMacro**
4. Select the **Save** button. *The file is saved.*	Click `Save`

Close the **DateMacro.xlsm** file.

13.3 RUNNING A MACRO

Concepts

Before you can run a macro, the workbook in which it is saved must be open. When you select a macro from the **Macro** dialog box, Excel performs its commands in sequence. Macros in any open workbook can be run from any other open workbook.

![Steps icon] **Steps**

Run a recorded macro.

Open the **DateMacro2.xlsm** file. If necessary, enable the macros. Select cell **F4**.

1. Select the **VIEW** tabin the **Ribbon**. *The VIEW tab is displayed.*	Click **VIEW**
2. Select the **Macros** button in the **Macros** group. *The Macro dialog box opens.*	Click
3. Select the macro you want to run. *The macro is selected.*	Click **Current_Date**
4. Select the **Run** button. *The Macro dialog box closes, and the macro runs.*	Click

You can also press the shortcut key, if any has been assigned to run the macro.
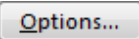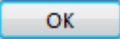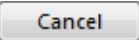
Close the **DateMacro2.xlsm** file.

13.4 ASSIGNING A SHORTCUT KEY

![Steps icon] **Steps**

Assign a shortcut key to a macro.

Open the **DateMacro3.xlsm** file. If necessary, enable the macros and display the **DEVELOPER** tab.

1. Select the **Macros** button in the **Code** group on the **DEVELOPER** tab. *The Macro dialog box opens.*	Click

2. Select the macro you want to assign a shortcut key from the **Macro** list. *The macro is selected.*	Click **PgSetup**
3. Select the **Options** button. *The **Macro Options** dialog box opens with the insertion point in the **Shortcut key** box.*	Click Options...
4. Type the desired shortcut key character. *The character appears in the **Shortcut key** box.*	Type **g**
5. Select **OK**. *The **Macro Options** dialog box closes and the shortcut key is assigned to the macro.*	Click OK
6. Select **Cancel**. *The **Macro** dialog box closes.*	Click Cancel

13.5 USING A SHORTCUT KEY

Steps

Use a shortcut key run a macro.

Open the **DateMacro3.xlsm** file. If necessary, enable the macros. Click on a blank cell. The shortcut key for the **Current_Date** macro is the lowercase letter **e**.

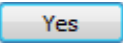| 1. Press the shortcut key assigned to the macro. *The macro runs.*	Press [**CTRL + e**]

13.6 DELETING A MACRO

Steps

Delete a macro.

Open the **DateMacro3.xlsm** file. If necessary, enable the macros and display the **DEVELOPER** tab.

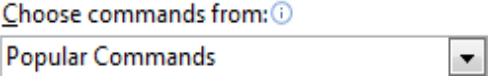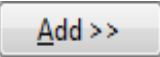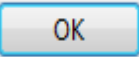|	
1. Select the **VIEW** tab in the **Ribbon**. *The VIEW tab is displayed.*	Click **VIEW**
2. Select the **Macros** button in the **Macros** group. *The Macro dialog box opens.*	Click Macros
3. Select the macro you want to delete. *The macro is selected.*	Click **PgSetup**
4. Select the **Delete** button. *The Macro dialog box closes and a Microsoft Office Excel message box opens asking you to confirm the deletion.*	Click Delete
5. Select **Yes**. *The Microsoft Office Excel message box closes and the macro is deleted.*	Click Yes

13.7 ADDING A MACRO TO THE QUICK ACCESS TOOLBAR

Steps

Add a macro to the Quick Access Toolbar (QAT).

Open the **DateMacro3.xlsm** file. If necessary, enable the macros.

1. Select the **Customize Quick Access Toolbar** button to the right of the **QAT**. *The Customize Quick Access Toolbar menu opens.*	Click ⁻
2. Select **More Commands**. *The Excel Options dialog box opens with the Quick Access Toolbar page displayed.*	Click **More Commands**
3. Select the **Choose commands from** list. *A list of available options is displayed.*	Choose commands from: ⓘ Click Popular Commands ▾
4. Select **Macros**. *A list of available macros is displayed in the Commands list.*	Click **Macros**
5. Select the desired macro from the **Commands** list. *The macro name is selected.*	Click **Current_Date**
6. Select the **Add** button. *The macro is added to the Customize Quick Access Toolbar list.*	Click [Add >>]
7. Select **OK**. *The Excel Options dialog box closes and the macro button appears in the Quick Access Toolbar.*	Click [OK]

13.8 DELETING A MACRO TO THE QUICK ACCESS TOOLBAR

Steps

Delete a macro from the Quick Access Toolbar (QAT).

1. Right-click the button on the QAT that you want to remove. *The **Quick Access Toolbar** shortcut menu appears.*	Right-click
2. Select **Remove from the Quick Access Toolbar**. *The selected button is removed from the **Quick Access Toolbar**.*	Click **Remove from the Quick Access Toolbar**

Close the **DateMacro3.xlsm** file.

13.9 REVIEW EXERCISE

Recording macros

1. Create a new blank workbook.

2. In cell **A1**, begin recording a macro name **Border**. Assign [**CTRL + d**] as a shortcut key. Store the macro in the current workbook.

3. Perform the following steps to record the Border macro:

   - Add bold and blue font color to the active cell.

   - Change the font size to 14

   - Apply a Top and Double Bottom Border to the cell.

4. Stop recording the macro. Clear all contents and formatting from cell **A1**.

   (**Hint**: Use the **Clear** button in the **Editing** group on the **HOME** tab.).

5. Select cell **A1** and run the macro.

6. Close the workbook without saving it.

LESSON 14 - COMMENTS & PASTE SPECIAL
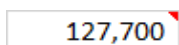
In this section, you will learn about:

- Inserting comments
- Viewing comments
- Reviewing comments
- Printing comments
- Using Paste Special

14.1 INSERTING COMMENTS

💡 Concepts

Comments are notes added to cells to give the reader additional information relating to the data it contains. When a cell contains a comment, a red indicator appears in the top right of the cell.

When you point the mouse on the cell, the comment appears.
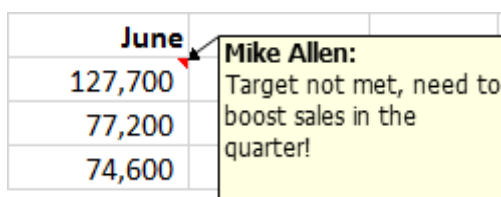
👣 Steps

Insert a comment.

Open the **Comments.xlsx** file.

1. Select a cell to add the comment. *The cell is selected.*	Select cell **A8**
2. Select the **New Comment** button in the **Comments** group on the **REVIEW** tab. *A comment box with the user name, sizing handles, and an arrow pointing to the selected cell is displayed.*	Click
3. Type the required text. *The text appears in the comment box.*	Type **Need to consolidate with Online**

Click anywhere else in the worksheet.

14.2 VIEWING COMMENTS

Steps

View comments in a worksheet.

1. Point to the cell containing the comment you want to view. *The comment attached to the selected cell appears.*	Point to cell **C6**
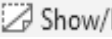
14.3 REVIEWING COMMENTS

Steps

Use the comment reviewing buttons.

If necessary, display the **REVIEW** tab.

1. Select the cell containing the comment you want to permanently display. *The cell is selected.*	Click cell **D4**
2. Select the **Show/Hide Comment** button in the **Comments** group to permanently display the comment. *The comment attached to the selected cell appears.*	Click Show/Hide Comment
3. Select the **Next** button in the **Comments** group twice to select the next comment. *The next comment appears.*	Click Next twice
4. Select the **Previous** button in the **Comments** group to select the previous comment. *The previous comments appears.*	Click Previous

5. Select the **Show/Hide Comment** button in the **Comments** group to hide the selected comment. *The comment disappears.*	Click Show/Hide Comment
6. Select the **Show All Comments** button in the **Comments** group to show all comments in the worksheet. *All comments in the worksheet appear.*	Click Show All Comments
7. Select the **Show All Comments** button in the **Comments** group to hide all comments in the worksheet. *All comments in the worksheet disappear.*	Click Show All Comments

Practice the concept:

1. Use the **Edit Comment** button in the **Comments** group to change the comment in cell **D4**.

2. Change the word quarter to month and click any cell to exit the comment.

3. Then, use the **Delete** button to delete the comment in cell **C6**.
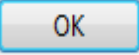
14.4 PRINTING COMMENTS

 Steps

Print comments of a worksheet.

1. Select the **PAGE LAYOUT** tab. *The **PAGE LAYOUT** tab appears.*	Click **PAGE LAYOUT**
2. Select the **Print Titles** button in the **Page Setup** group. *The Page Setup dialog box displays.*	 Click Print Titles
3. Select the **Sheet** tab. *The **Sheet** page appears.*	Click **Sheet**

4. Select the **Comments** list box. *The list of available options appears.*	Click Comments: (None) ▾
5. Select the required option. *The required option is selected.*	Click **At end of sheet**
6. Select **Print** *The **Page Setup** dialog box closes, and the **Print** dialog box opens.*	Click Print...
7. Select **OK**. *The **Print** dialog box closes, and Excel prints the worksheet and comments accordingly.*	Click OK

14.5 PASTE SPECIAL

Concepts

Paste special can be used to add the contents of a cell to one or more specified cells. It can also be used to subtract the contents of a cell from one or more specified cells.

It can also be used to multiply the contents of one or more cells with the content of a cell or it can be used to divide the contents of one or more cells by the contents of a cell.
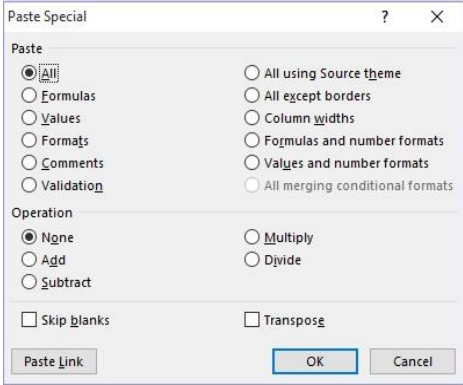
Steps

Open **Comments.xlsx.**

To use the Paste Special to add, subtract, multiply or divide:

1. Add a value that you will use to add, subtract, multiply or divide. *1.5 is entered in cell **F4***	Enter 1.5 in cell **F4**.
2. Select the cell contents to be added, subtracted, multiplied or divided. *You are going to use the value in F4 to multiply values in other cells.*	Select **F4**
3. From the **HOME** tab, select the **Copy** button from the **Clipboard**	Click Copy

group. *The value in F4 is copied.*	
4. Select the cell or cells to which the paste will be applied. *The cells that will be multiplied are selected*	Select cells **B4** and **B7**
5. From the **HOME** tab, select the **Paste** button arrow from the **Clipboard** group.	Click Paste
6. Select **Paste Special** to open the **Paste Special** dialog box. *The Paste Special dialog box displays.*	Click **Paste Special…**
7. Under **Operation** select the operation you wish to carry out: **Add**, **Subtract**, **Multiply**, or **Divide.** *The Paste Special dialog box closes.The values in cells B4 and B7 have been multipled by 1.5.*	Select **Multiply** and Click **OK**.

Paste special options: values /numbers
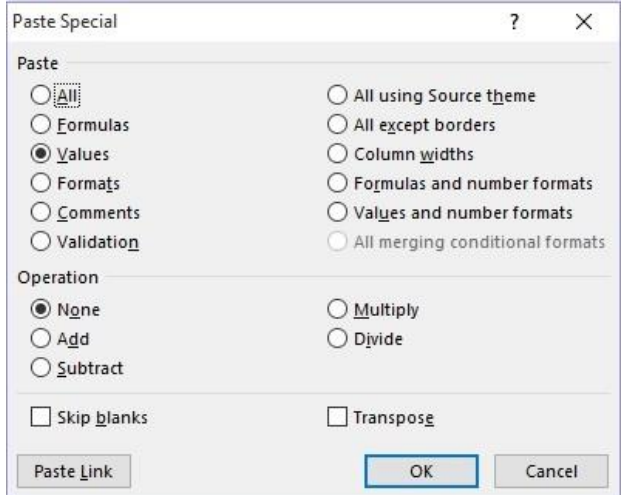
You can also use Paste Special to paste formulas as values/numbers.

Steps

Open the **Comments.xlsx** file.

1. Select cells to paste as values. *The cells are selected.*	Select cells **B9:D9**
2. Select the **Copy** button in the **Clipboard** group on the **HOME** tab. *A blinking marquee appears around the copied selection.*	Click Copy

5. Click the **Paste** button **arrow** in the **Clipboard** group of the **HOME** tab and choose **Paste Special**.	Click Paste
6. From the **Paste Special** dialog choose **Values** and click OK. *Cells B9:D9 will display only as values.*	

Paste special options: transpose.

Transpose can be used to switch data from columns to rows, or vice versa.

Open the **Comments.xlsx** file.

1. Select the range to transpose. *The cells are selected.*	Select cells **A3:D8**
2. Select the **Copy** button in the **Clipboard** group on the **HOME** tab. *A blinking marquee appears around the copied selection.*	Click Copy
3. Select a destination cell	Click G3
4. Click the **Paste** button **arrow** in the **Clipboard** group of the **HOME** tab and choose **Paste Special**.	Click Paste

5. From the **Paste Special** dialog choose **Transpose** and click **OK**. *Data is switched from columns to rows*	
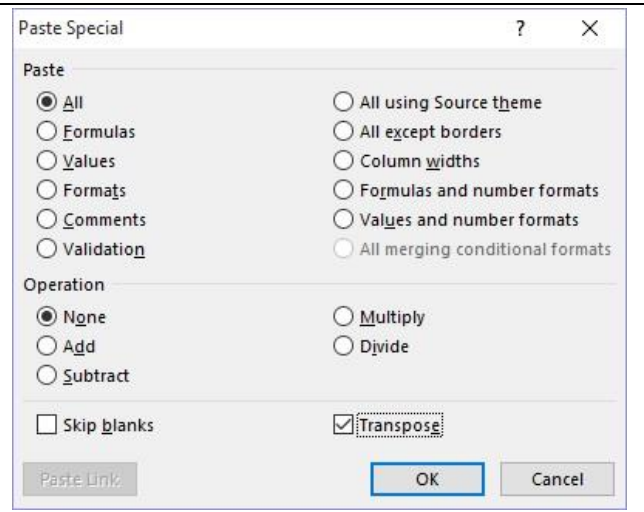
14.6 REVIEW EXERCISE

Comments

1. Open the **Expenses.xlsx** file.

2. Insert the comment **Acquired new products last month** in cell **C3**.

3. Display the comment in cell **A2**.

4. Delete the comment in cell **D4**.

5. Show all the comments in the worksheet.

6. Copy the data in the cell range **A1:D5** and paste it into cell **A8**, transposing rows and columns.

7. Close the workbook without saving it.

ICDL Syllabus

Ref	ICDL Task Item	Location	Ref	ICDL Task Item	Location
AM4.1.1.1	Apply an autoformat/table style to a cell range.	*1.1 Applying An Autoformat/Table Style To A Cell Range*	AM4.2.1.7	Use database functions: dsum, dmin, dmax, dcount, daverage.	*4.8 Using Database Functions*
AM4.1.1.2	Apply conditional formatting based on cell content.	*1.2 Applying Conditional Formats*	AM4.2.1.8	Create a two-level nested function.	*9.4 Using Nested If Functions*
AM4.1.1.3	Create and apply custom number formats.	*1.8 Creating A Custom Number Format*	AM4.2.1.9	Use a 3-D reference within a sum function.	*9.15 Using A 3-D Reference Within A Sum Function*
AM4.1.2.1	Copy, move worksheets between spreadsheets.	*2.1 Copying Worksheets*	AM4.2.1.10	Use mixed references in formulas.	*9.16 Use Mixed References In Formulas*
AM4.1.2.2	Split a window. Move, remove split bars.	*2.4 Split A Window. Move, Remove Split Bars*	AM4.3.1.1	Create a combined column and line chart.	*5.1 Create A Combined Column And Line Chart*
AM4.1.2.3	Hide, show rows, columns, worksheets.	*2.2 Hiding Columns And Rows*	AM4.3.1.2	Add a secondary axis to a chart.	5.7 Using A Secondary Axis
AM4.2.1.1	Use date and time functions: today, now, day, month, year.	*9.8 Using Date Functions*	AM4.3.1.3	Change the chart type for a defined data series.	*5.8 Changing Data Series Chart Types*
AM4.2.1.2	Use mathematical functions: rounddown, roundup, sumif.	*9.11 Using The Sumif Function*	AM4.3.1.4	Add, delete a data series in a chart.	*5.9 Changing Source Data Range*
AM4.2.1.3	Use statistical functions: countif, countblank, rank.	*9.12 Using The Rank Function*	AM4.3.2.1	Re-position chart title, legend, data labels.	*5.2 Re-Position Chart Title, Legend, Data Labels*
		9.9 Using The Countif Function			
		9.10 Using the Countblank Function	AM4.3.2.2	Change scale of value axis: minimum, maximum number to display, major interval.	*5.4 Changing The Axis Scaling*
AM4.2.1.4	Use text functions: left, right, mid, trim, concatenate.	*9.14 Using Text Functions*	AM4.3.2.3	Change display units on value axis without changing data source: hundreds, thousands, millions.	*5.4 Changing The Axis Scaling*
AM4.2.1.5	Use financial functions: fv, pv, pmt.	*9.13 Using Financial Functions*	AM4.3.2.4	Format columns, bars, plot area, chart area to display an image.	*5.5 Formatting The Data Series*
AM4.2.1.6	Use lookup functions: vlookup, hlookup.	*9.1 Using The Vlookup Function*	AM4.4.1.1	Create, modify a pivot table/datapilot.	*6.1 Creating A Pivottable Report*
		9.2 Using The Hlookup Function	AM4.4.1.2	Modify the data source and refresh the pivot table/datapilot.	*6.4 Refreshing A Pivottable Report*

Ref	ICDL Task Item	Location	Ref	ICDL Task Item	Location
AM4.4.1.3	Filter, sort data in a pivot table/datapilot.	*6.3 Selecting A Report Filter Item*	AM4.5.2.1	Trace precedent, dependent cells. Identify cells with missing dependents.	7.8 Displaying/Removing Dependent Arrows
AM4.4.1.4	Automatically, manually group data in a pivot table/datapilot and rename groups.	*6.13 Grouping Data Manually*			7.9 Displaying/Removing precedent Arrows
AM4.4.1.5	Use one-input, two-input data tables/multiple operations tables.	*10.7 Creating A One-Variable Table*	AM4.5.2.2	Show all formulas in a worksheet, rather than the resulting values.	*7.10 Showing Formulas*
		10.8 Creating A Two-Variable Table	AM4.5.2.3	Insert, edit, delete, show, hide comments/notes.	*14.1 Inserting Comments*
AM4.4.2.1	Sort data by multiple columns at the same time.	*3.3 Sorting Data By Multiple Levels*			*14.2 Viewing Comments*
AM4.4.2.2	Create a customised list and perform a custom sort.	*3.4 Using Custom Sort*			*14.3 Reviewing Comments*
AM4.4.2.3	Automatically filter a list in place.	*4.1 Automatically Filter A List In Place*	AM4.6.1.1	Name cell ranges, delete names for cell ranges.	*7.1 Jumping To A Named Range*
					7.2 Assigning Names
AM4.4.2.4	Apply advanced filter options to a list.	*4.5 Using an Advanced AND Condition*			*7.6 Deleting Range Names*
AM4.4.2.5	Use automatic sub-totalling features.	*3.1 Creating Subtotals In A List*	AM4.6.1.2	Use named cell ranges in a function.	*7.3 Using Range Names In Formulas*
AM4.4.2.6	Expand, collapse outline detail levels.	*3.1 Creating Subtotals In A List*	AM4.6.2.1	Use paste special options: add, subtract, multiply, divide.	*14.5 Paste Special*
AM4.4.3.1	Create named scenarios.	*10.1 Creating A Scenario*	AM4.6.2.2	Use paste special options: values /numbers, transpose.	*14.5 Paste Special*
AM4.4.3.2	Show, edit, delete scenarios.	*10.2 Displaying A Scenario*	AM4.6.3.1	Create a spreadsheet based on an existing template.	*2.6 Using A Template*
AM4.4.3.3	Create a scenario summary report.	*10.4 Creating A Scenario Summary Report*	AM4.6.3.2	Modify a template.	*2.7 Editing A Template*
AM4.5.1.1	Set, edit validation criteria for data entry in a cell range like: whole number, decimal, list, date, time.	*3.5 Using Data Validation*	AM4.6.4.1	Insert, edit, remove a hyperlink.	8.4 Creating A Hyperlink
					8.5 Editing A Hyperlink
AM4.5.1.2	Enter input message and error alert.	*3.7 Creating A Custom Error Message*			8.6 Removing A Hyperlink

Ref	ICDL Task Item	Location
AM4.6.4.2	Link data within a spreadsheet, between spreadsheets, between applications.	*8.1 Linking Data Within A Spreadsheet*
AM4.6.4.3	Update, break a link.	*8.3 Removing Linked Data*
AM4.6.4.4	Import delimited data from a text file.	*8.2 Importing Data From Text Files*
AM4.6.5.1	Record a simple macro like: change page setup, apply a custom number format, apply autoformats to a cell range, insert fields in worksheet header, footer.	*13.1 Recording A Macro*
AM4.6.5.2	Run a macro.	*13.3 Running A Macro*
AM4.6.5.3	Assign a macro to a custom button on a toolbar.	*13.7 Adding A Macro To The Quick Access Toolbar*
AM4.7.1.1	Turn on, off track changes. Track changes in a worksheet using a specified display view.	*12.5 Highlighting Changes*
AM4.7.1.2	Accept, reject changes in a worksheet.	*12.10 Reviewing Tracked Changes*
AM4.7.1.3	Compare and merge spreadsheets.	*12.11 Merging Shared Workbook Files*
AM4.7.2.1	Add, remove password protection for a spreadsheet: to open, to modify.	*11.9 Assigning A Password* *11.10 Opening A Password-Protected File* *11.11 Removing A Password*
AM4.7.2.2	Protect, unprotect cells, worksheet with a password.	*11.1 Unlocking Cells In Worksheet* *11.3 Protecting A Worksheet* *11.4 Unprotecting A Worksheet*
AM4.7.2.3	Hide, unhide formulas.	*11.2 Hide, Unhide Formulas*

Congratulations! You have reached the end of the ICDL Advanced Spreadsheets book.

You have learned about the key advanced skills relating to spreadsheet software, including:

- Apply advanced formatting options such as conditional formatting and customised number formatting.
- Create charts and apply advanced chart formatting features.
- Validate and audit spreadsheet data.
- Use linking, embedding and importing features to integrate data.
- Apply spreadsheet security features.

Having reached this stage of your learning, you should now be ready to undertake ICDL certified testing. For further information on taking this test, please contact your ICDL test centre.