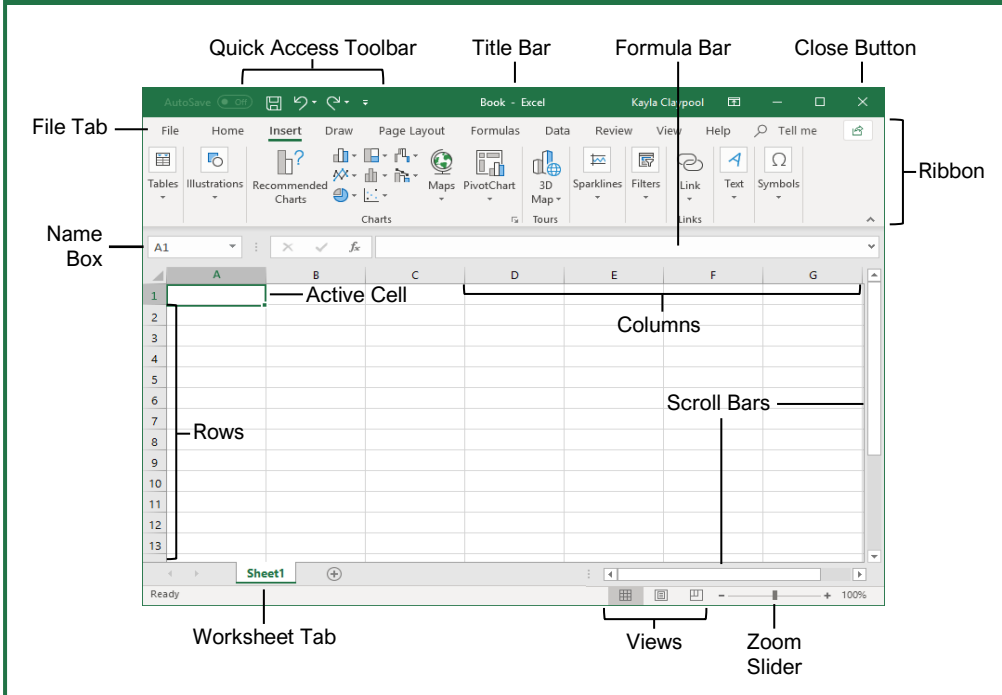




Microsoft®  
**Excel 2019 Basic**  
 Quick Reference Guide

## The Excel 2019 Program Screen



## Keyboard Shortcuts

### General

Open a workbook.....	<b>Ctrl + O</b>
Create a new workbook.....	<b>Ctrl + N</b>
Save a workbook.....	<b>Ctrl + S</b>
Print a workbook.....	<b>Ctrl + P</b>
Close a workbook.....	<b>Ctrl + W</b>
Help.....	<b>F1</b>
Activate Tell Me field.....	<b>Alt + Q</b>
Spell check.....	<b>F7</b>
Calculate worksheets.....	<b>F9</b>
Create absolute reference ...	<b>F4</b>

### Navigation

Move between cells.....	<b>↑, ↓, ←, →</b>
Right one cell.....	<b>Tab</b>
Left one cell.....	<b>Shift + Tab</b>
Down one cell.....	<b>Enter</b>
Up one cell.....	<b>Shift + Enter</b>
Down one screen.....	<b>Page Down</b>
To first cell of active row.....	<b>Home</b>
Enable End mode.....	<b>End</b>
To cell A1.....	<b>Ctrl + Home</b>
To last cell.....	<b>Ctrl + End</b>

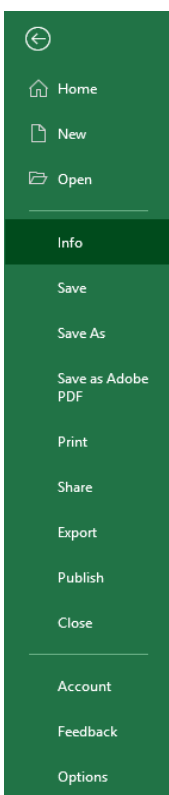
### Editing

Cut.....	<b>Ctrl + X</b>
Copy.....	<b>Ctrl + C</b>
Paste.....	<b>Ctrl + V</b>
Undo.....	<b>Ctrl + Z</b>
Redo.....	<b>Ctrl + Y</b>
Find.....	<b>Ctrl + F</b>
Replace.....	<b>Ctrl + H</b>
Edit active cell.....	<b>F2</b>
Clear cell contents.....	<b>Delete</b>

### Formatting

Bold.....	<b>Ctrl + B</b>
Italics.....	<b>Ctrl + I</b>
Underline.....	<b>Ctrl + U</b>
Open Format Cells dialog box.....	<b>Ctrl + Shift + F</b>
Select All.....	<b>Ctrl + A</b>
Select entire row.....	<b>Shift + Space</b>
Select entire column.....	<b>Ctrl + Space</b>
Hide selected rows.....	<b>Ctrl + 9</b>
Hide selected columns.....	<b>Ctrl + 0</b>

## Getting Started



**Create a Workbook:** Click the **File** tab and select **New** or press **Ctrl + N**. Double-click a workbook.

**Open a Workbook:** Click the **File** tab and select **Open** or press **Ctrl + O**. Select a recent file or navigate to the location where the file is saved.

**Preview and Print a Workbook:** Click the **File** tab and select **Print**.

**Undo:** Click the **Undo** button on the Quick Access Toolbar.

**Redo or Repeat:** Click the **Redo** button on the Quick Access Toolbar. The button turns to Repeat once everything has been re-done.

**Use Zoom:** Click and drag the zoom slider to the left or right.

**Select a Cell:** Click a cell or use the keyboard arrow keys to select it.

**Select a Cell Range:** Click and drag to select a range of cells. Or, press and hold down the **Shift** key while using the arrow keys to move the selection to the last cell of the range.

**Select an Entire Worksheet:** Click the **Select All** button where the column and row headings meet.

**Select Non-Adjacent Cells:** Click the first cell or cell range, hold down the **Ctrl** key, and select any non-adjacent cell or cell range.

**Cell Address:** Cells are referenced by the coordinates made from their column letter and row number, such as cell A1, B2, etc.




**Jump to a Cell:** Click in the **Name Box**, type the cell address you want to go to, and press **Enter**.

**Change Views:** Click a **View** button in the status bar. Or, click the **View** tab and select a view.


**Recover an Unsaved Workbook:** Restart Excel. If a workbook can be recovered, it will appear in the Document Recovery pane. Or, click the **File** tab, click **Recover unsaved workbooks** to open the pane, and select a workbook from the pane.


## Edit a Workbook


**Edit a Cell's Contents:** Select a cell and click in the Formula Bar or double-click the cell. Edit the cell's contents and press **Enter**.

**Clear a Cell's Contents:** Select the cell(s) and press the **Delete** key. Or, click the **Clear**  button on the Home tab and select **Clear Contents**.

**Cut or Copy Data:** Select cell(s) and click the **Cut**  or **Copy**  button on the Home tab.


**Paste Data:** Select the cell where you want to paste the data and click the **Paste**  button in the Clipboard group on the Home tab.


**Preview an Item Before Pasting:** Place the insertion point where you want to paste, click the **Paste**  button list arrow in the Clipboard group on the Home tab, and hold the mouse over a paste option to preview.


**Paste Special:** Select the destination cell(s), click the **Paste**  button list arrow in the Clipboard group on the Home tab, and select **Paste Special**. Select an option and click **OK**.


**Move or Copy Cells Using Drag and Drop:** Select the cell(s) you want to move or copy, position the pointer over any border of the selected cell(s), then drag to the destination cells. To copy, hold down the **Ctrl** key before starting to drag.

**Find and Replace Text:** Click the **Find & Select** button, select **Replace**. Type the text you want to find in the Find what box. Type the replacement text in the Replace with box. Click the **Replace All** or **Replace** button.

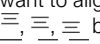
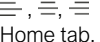
**Check Spelling:** Click the **Review** tab and click the **Spelling**  button. For each result, select a suggestion and click the **Change/Change All** button. Or, click the **Ignore/Ignore All** button.

**Insert a Column or Row:** Right-click to the right of the column or below the row you want to insert. Select **Insert** in the menu, or click the **Insert**  button on the Home tab.


**Delete a Column or Row:** Select the row or column heading(s) you want to remove. Right-click and select **Delete** from the contextual menu, or click the **Delete**  button in the Cells group on the Home tab.


**Hide Rows or Columns:** Select the rows or columns you want to hide, click the **Format**  button on the Home tab, select **Hide & Unhide**, and select **Hide Rows** or **Hide Columns**.


## Basic Formatting


**Change Cell Alignment:** Select the cell(s) you want to align and click a vertical alignment  button or a horizontal alignment  button in the Alignment group on the Home tab.



## Basic Formatting


**Format Text:** Use the commands in the Font group on the Home tab, or click the dialog box launcher  in the Font group to open the dialog box.

**Format Values:** Use the commands in the Number group on the Home tab, or click the dialog box launcher  in the Number group to open the Format Cells dialog box.

**Wrap Text in a Cell:** Select the cell(s) that contain text you want to wrap and click the **Wrap Text**  button on the Home tab.

**Merge Cells:** Select the cells you want to merge. Click the **Merge & Center**  button list arrow on the Home tab and select a merge option.


**Cell Borders and Shading:** Select the cell(s) you want to format. Click the **Borders**  button and/or the **Fill Color**  button and select an option to apply to the selected cell.

**Copy Formatting with the Format Painter:** Select the cell(s) with the formatting you want to copy. Click the **Format Painter**  button in the Clipboard group on the Home tab. Then, select the cell(s) you want to apply the copied formatting to.


**Adjust Column Width or Row Height:** Click and drag the right border of the column header or the bottom border of the row header. Double-click the border to AutoFit the column or row according to its contents.


## Basic Formulas


**Enter a Formula:** Select the cell where you want to insert the formula. Type **=** and enter the formula using values, cell references, operators, and functions. Press **Enter**.

**Insert a Function:** Select the cell where you want to enter the function and click the **Insert Function**  button next to the formula bar.

**Reference a Cell in a Formula:** Type the cell reference (for example, B5) in the formula or click the cell you want to reference.



**SUM Function:** Click the cell where you want to insert the total and click the **Sum**  button in the Editing group on the Home tab. Enter the cells you want to total, and press **Enter**.


**MIN and MAX Functions:** Click the cell where you want to place a minimum or maximum value for a given range. Click the **Sum**  button list arrow on the Home tab and select either **Min** or **Max**. Enter the cell range you want to reference, and press **Enter**.


**COUNT Function:** Click the cell where you want to place a count of the number of cells in a range that contain numbers. Click the **Sum**  button list arrow on the Home tab and select **Count Numbers**. Enter the cell range you want to reference, and press **Enter**.

## Insert Objects

**Complete a Series Using AutoFill:** Select the cells that define the pattern, i.e. a series of months or years. Click and drag the fill handle to adjacent blank cells to complete the series.


**Insert an Image:** Click the **Insert** tab on the ribbon, click either the **Pictures**  or **Online Pictures**  button in the Illustrations group, select the image you want to insert, and click **Insert**.

**Insert a Shape:** Click the **Insert** tab on the ribbon, click the **Shapes**  button in the Illustrations group, and select the shape you wish to insert.

**Hyperlink Text or Images:** Select the text or graphic you want to use as a hyperlink. Click the **Insert** tab, then click the **Link**  button. Choose a type of hyperlink in the left pane of the Insert Hyperlink dialog box. Fill in the necessary informational fields in the right pane, then click **OK**.

**Modify Object Properties and Alternative Text:** Right-click an object. Select **Edit Alt Text** in the menu and make the necessary modifications under the Properties and Alt Text headings.

## View and Manage Worksheets

**Insert a New Worksheet:** Click the **Insert Worksheet**  button next to the sheet tabs below the active sheet. Or, press **Shift + F11**.


**Delete a Worksheet:** Right-click the sheet tab and select **Delete** from the menu.


**Hide a Worksheet:** Right-click the sheet tab and select **Hide** from the menu.


**Rename a Worksheet:** Double-click the sheet tab, enter a new name for the worksheet, and press **Enter**.

**Change a Worksheet's Tab Color:** Right-click the sheet tab, select **Tab Color**, and choose the color you want to apply.

**Move or Copy a Worksheet:** Click and drag a worksheet tab left or right to move it to a new location. Hold down the **Ctrl** key while clicking and dragging to copy the worksheet.

**Switch Between Excel Windows:** Click the **View** tab, click the **Switch Windows**  button, and select the window you want to make active.

**Freeze Panes:** Activate the cell where you want to freeze the window, click the **View** tab on the ribbon, click the **Freeze Panes**  button in the Window group, and select an option from the list.

**Select a Print Area:** Select the cell range you want to print, click the **Page Layout** tab on the ribbon, click the **Print Area**  button, and select **Set Print Area**.



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# Excel 2019 Intermediate

## Quick Reference Guide



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### Chart Elements



### Chart Options

#### Chart Types

**Column:** Used to compare different values vertically side-by-side. Each value is represented in the chart by a vertical bar.

**Line:** Used to illustrate trends over time (days, months, years). Each value is plotted as a point on the chart and values are connected by a line.

**Pie:** Useful for showing values as a percentage of a whole when all the values add up to 100%. The values for each item are represented by different colors.

**Bar:** Similar to column charts, except they display information in horizontal bars rather than in vertical columns.

**Area:** Similar to line charts, except the areas beneath the lines are filled with color.

**XY (Scatter):** Used to plot clusters of values using single points. Multiple items can be plotted by using different colored points or different point symbols.

**Stock:** Effective for reporting the fluctuation of stock prices, such as the high, low, and closing points for a certain day.

**Surface:** Useful for finding optimum combinations between two sets of data. Colors and patterns indicate values that are in the same range.

#### Additional Chart Elements

**Data Labels:** Display values from the cells of the worksheet on the plot area of the chart.

**Data Table:** A table added next to the chart that shows the worksheet data the chart is illustrating.

**Error Bars:** Help you quickly identify standard deviations and error margins.

**Trendline:** Identifies the trend of the current data, not actual values. Can also identify forecasts for future data.

#### Charts

**Create a Chart:** Select the cell range that contains the data you want to chart. Click the **Insert** tab on the ribbon. Click a chart type button in the Charts group and select the chart you want to insert.

**Move or Resize a Chart:** Select the chart. Place the cursor over the chart's border and, with the 4-headed arrow  $\updownarrow\left\langle\right\rangle$  showing, click and drag to move it. Or, click and drag a sizing handle  $\square$  to resize it.

**Change the Chart Type:** Select the chart and click the **Design** tab. Click the **Change Chart Type**  $\square$  button and select a different chart.

**Filter a Chart:** With the chart you want to filter selected, click the **Filter**  $\nabla$  button next to it. Deselect the items you want to hide from the chart view and click the **Apply** button.

**Position a Chart's Legend:** Select the chart, click the **Chart Elements**  $\pm$  button, click the **Legend** button, and select a position for the legend.

**Show or Hide Chart Elements:** Select the chart and click the **Chart Elements**  $\pm$  button. Then, use the check boxes to show or hide each element.

**Insert a Trendline:** Select the chart where you want to add a trendline. Click the **Design** tab on the ribbon and click the **Add Chart Element**  $\pm$  button. Select **Trendline** from the menu.

#### Charts

**Insert a Sparkline:** Select the cells you want to summarize. Click the **Insert** tab and select the sparkline you want to insert. In the Location Range field, enter the cell or cell range to place the sparkline and click **OK**.

**Create a Dual Axis Chart:** Select the cell range you want to chart, click the **Insert** tab, click the **Combo**  $\square$  button, and select a combo chart type.

#### Print and Distribute

**Set the Page Size:** Click the **Page Layout** tab. Click the **Size**  $\square$  button and select a page size.

**Set the Print Area:** Select the cell range you want to print. Click the **Page Layout** tab, click the **Print Area**  $\square$  button, and select **Set Print Area**.

**Print Titles, Gridlines, and Headings:** Click the **Page Layout** tab. Click the **Print Titles**  $\square$  button and set which items you wish to print.

**Add a Header or Footer:** Click the **Insert** tab and click the **Header & Footer**  $\square$  button. Complete the header and footer fields.

**Adjust Margins and Orientation:** Click the **Page Layout** tab. Click the **Margins**  $\square$  button to select from a list of common page margins. Click the **Orientation**  $\square$  button to choose Portrait or Landscape orientation.

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## Intermediate Formulas

**Absolute References:** Absolute references always refer to the same cell, even if the formula is moved. In the formula bar, add dollar signs (\$) to the reference you want to remain absolute (for example, **\$A\$1** makes the column and row remain constant).

**Name a Cell or Range:** Select the cell(s), click the Name box in the Formula bar, type a name for the cell or range, and press **Enter**. Names can be used in formulas instead of cell addresses, for example: **=B4\*Rate**.

**Reference Other Worksheets:** To reference another worksheet in a formula, add an exclamation point '!' after the sheet name in the formula, for example:  
**=FebruarySales!B4**.

**Reference Other Workbooks:** To reference another workbook in a formula, add brackets '[' ]' around the file name in the formula, for example:  
**=[FebruarySales.xlsx]Sheet1!B\$4**.

**Order of Operations:** When calculating a formula, Excel performs operations in the following order: Parentheses, Exponents, Multiplication and Division, and finally Addition and Subtraction (as they appear left to right). Use this mnemonic device to remember them:

<b>Please</b>	Parentheses
<b>Excuse</b>	Exponents
<b>My</b>	Multiplication
<b>Dear</b>	Division
<b>Aunt</b>	Addition
<b>Sally</b>	Subtraction

**Concatenate Text:** Use the CONCAT function **=CONCAT(text1,text2,...)** to join the text from multiple cells into a single cell. Use the arguments within the function to define the text you want to combine as well as any spaces or punctuation.

**Payment Function:** Use the PMT function **=PMT(rate,nper,pv,...)** to calculate a loan amount. Use the arguments within the function to define the loan rate, number of periods, and present value and Excel calculates the payment amount.

**Date Functions:** Date functions are used to add a specific date to a cell. Some common date functions in Excel include:

<b>Date</b>	=DATE(year,month,day)
<b>Today</b>	=TODAY()
<b>Now</b>	=NOW()

**Display Worksheet Formulas:** Click the **Formulas** tab on the ribbon and then click the **Show Formulas** button. Click the **Show Formulas** button again to turn off the formula view.

## Manage Data

**Export Data:** Click the **File** tab. At the left, select **Export** and click **Change File Type**. Select the file type you want to export the data to and click **Save As**.

**Import Data:** Click the **Data** tab on the ribbon and click the **Get Data** button. Select the category and data type, and then the file you want to import. Click **Import**, verify the preview, and then click the **Load** button.

**Use the Quick Analysis Tools:** Select the cell range you want to summarize. Click the **Quick Analysis** button that appears. Select the analysis tool you want to use. Choose from formatting, charts, totals, tables, or sparklines.

**Outline and Subtotal:** Click the **Data** tab on the ribbon and click the **Subtotal** button. Use the dialog box to define which column you want to subtotal and the calculation you want to use. Click **OK**.

**Use Flash Fill:** Click in the cell to the right of the cell(s) where you want to extract or combine data. Start typing the data in the column. When a pattern is recognized, Excel predicts the remaining values for the column. Press **Enter** to accept the Flash Fill values.

**Create a Data Validation Rule:** Select the cells you want to validate. Click the **Data** tab and click the **Data Validation** button. Click the **Allow** list arrow and select the data you want to allow. Set additional validation criteria options and click **OK**.

## Tables

**Format a Cell Range as a Table:** Select the cells you want to apply table formatting to. Click the **Format as Table** button in the Styles group of the Home tab and select a table format from the gallery.

	A	B	C	D
1	Excursion	Jan	Feb	Mar
2	Beijing	6,010	7,010	6,520
3	Las Vegas	35,250	28,125	37,455
4	México DF	20,850	17,200	27,010
5	Paris	33,710	29,175	35,840
6	Tokyo	12,510	14,750	11,490
7	<b>Total</b>	<b>108,330</b>	<b>96,260</b>	<b>118,315</b>

**Sort Data:** Select a cell in the column you want to sort. Click the **Sort & Filter** button on the Home tab. Select a sort order or select **Custom Sort** to define specific sort criteria.

**Filter Data:** Click the filter arrow for the column you want to filter. Uncheck the boxes for any data you want to hide. Click **OK**.

**Add Table Rows or Columns:** Select a cell in the row or column next to where you want to add blank cells. Click the **Insert** button list arrow on the Home tab. Select either **Insert Table Rows Above** or **Insert Table Columns to the Left**.

## Tables

**Remove Duplicate Values:** Click any cell in the table and click the **Data** tab on the ribbon. Click the **Remove Duplicates** button. Select which columns you want to check for duplicates and click **OK**.

**Insert a Slicer:** With any cell in the table selected, click the **Design** tab on the ribbon. Click the **Insert Slicer** button. Select the columns you want to use as slicers and click **OK**.

**Table Style Options:** Click any cell in the table. Click the **Design** tab on the ribbon and select an option in the Table Style Options group.

## Intermediate Formatting

**Apply Conditional Formatting:** Select the cells you want to format. On the **Home** tab, click the **Conditional Formatting** button. Select a conditional formatting category and then the rule you want to use. Specify the format to apply and click **OK**.

**Apply Cell Styles:** Select the cell(s) you want to format. On the Home tab, click the **Cell Styles** button and select a style from the menu. You can also select **New Cell Style** to define a custom style.

**Apply a Workbook Theme:** Click the **Page Layout** tab on the ribbon. Click the **Themes** button and select a theme from the menu.

## Collaborate with Excel

**Add a Cell Comment:** Click the cell where you want to add a comment. Click the **Review** tab on the ribbon and click the **New Comment** button. Type your comment and then click outside of it to save the text.

**Invite People to Collaborate:** Click the **Share** button on the ribbon. Enter the email addresses of people you want to share the workbook with. Click the permissions button, select a permission level, and click **Apply**. Type a short message and click **Send**.

**Co-author Workbooks:** When another user opens the workbook, click the user's picture or initials on the ribbon, to see what they are editing. Cells being edited by others appear with a colored border or shading.

**Protect a Worksheet:** Before protecting a worksheet, you need to unlock any cells you want to remain editable after the protection is applied. Then, click the **Review** tab on the ribbon and click the **Protect Sheet** button. Select what you want to remain editable after the sheet is protected.

**Add a Workbook Password:** Click the **File** tab and select **Save As**. Click **Browse** to select a save location. Click the **Tools** button in the dialog box and select **General Options**. Set a password to open and/or modify the workbook. Click **OK**.



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# Excel 2019 Advanced

## Quick Reference Guide



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### PivotTable Elements

The screenshot shows an Excel spreadsheet with a PivotTable and the PivotTable Fields task pane. The PivotTable is located in cells B2:D8. The Fields pane is on the right, showing the following layout:

- Filters:** Name
- Columns:** Destination
- Rows:** Months, Date
- Values:** Sum of Tickets

Labels in the image include: Active PivotTable, Search PivotTable Fields, Fields Pane Options, Tools Menu, Field List, and PivotTable Field Areas.

### PivotTable Layout

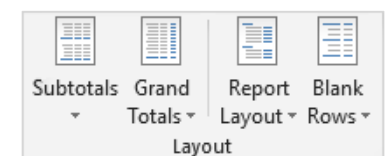
#### PivotTable Fields Pane

The PivotTable Fields pane controls how data is represented in the PivotTable. Click anywhere in the PivotTable to activate the pane. It includes a Search field, a scrolling list of fields (these are the column headings in the data range used to create the PivotTable), and four areas in which fields are placed. These four areas include:

- Filters:** If a field is placed in the Filters area, a menu appears above the PivotTable. Each unique value from the field is an item in the menu, which can be used to filter PivotTable data.
- Column Labels:** The unique values for the fields placed in the Columns area appear as column headings along the top of the PivotTable.
- Row Labels:** The unique values for the fields placed in the Rows area appear as row headings along the left side of the PivotTable.
- Values:** The values are the “meat” of the PivotTable, or the actual data that’s calculated for the fields placed in the rows and/or columns area. Values are most often numeric calculations.

Not all PivotTables will have a field in each area, and sometimes there will be multiple fields in a single area.

#### The Layout Group



**Subtotals:** Show or hide subtotals and specify their location in the PivotTable.

**Grand Totals:** Add or remove grand total rows for columns and/or rows.

**Report Layout:** Adjust the report layout to show in compact, outline, or tabular form.

**Blank Rows:** Emphasize groups of data by manually adding blank rows between grouped items.

### PivotTables

**Create a PivotTable:** Select the data range to be used by the PivotTable. Click the **Insert** tab on the ribbon and click the **PivotTable** button in the Tables group. Verify the range and then click **OK**.

**Add Multiple PivotTable Fields:** Click a field in the field list and drag it to one of the four PivotTable areas that contains one or more fields.

**Filter PivotTables:** Click and drag a field from the field list into the Filters area. Click the field’s list arrow above the PivotTable and select the value(s) you want to filter.

**Group PivotTable Values:** Select a cell in the PivotTable that contains a value you want to group by. Click the **Analyze** tab on the ribbon and click the **Group Field** button. Specify how the PivotTable should be grouped and then click **OK**.

**Refresh a PivotTable:** With the PivotTable selected, click the **Analyze** tab on the ribbon. Click the **Refresh** button in the Data group.

**Format a PivotTable:** With the PivotTable selected, click the **Design** tab. Then, select the desired formatting options from the PivotTable Options group and the PivotTable Styles group.

### PivotCharts

**Create a PivotChart:** Click any cell in a PivotTable and click the **Analyze** tab on the ribbon. Click the **PivotChart** button in the Tools group. Select a PivotChart type and click **OK**.

**Modify PivotChart Data:** Drag fields into and out of the field areas in the task pane.

**Refresh a PivotChart:** With the PivotChart selected, click the **Analyze** tab on the ribbon. Click the **Refresh** button in the Data group.

**Modify PivotChart Elements:** With the PivotChart selected, click the **Design** tab on the ribbon. Click the **Add Chart Element** button in the Chart Elements group and select the item(s) you want to add to the chart.

**Apply a PivotChart Style:** Select the PivotChart and click the **Design** tab on the ribbon. Select a style from the gallery in the Chart Styles group.

**Update Chart Type:** With the PivotChart selected, click the **Design** tab on the ribbon. Click the **Change Chart Type** button in the Type group. Select a new chart type and click **OK**.

**Enable PivotChart Drill Down:** Click the **Analyze** tab. Click the **Field Buttons** list arrow in the Show/Hide group and select **Show Expand/Collapse Entire Field Buttons**.

## Macros

**Enable the Developer Tab:** Click the **File** tab and select **Options**. Select **Customize Ribbon** at the left. Check the **Developer** check box and click **OK**.

**Record a Macro:** Click the **Developer** tab on the ribbon and click the **Record Macro** button. Type a name and description then specify where to save it. Click **OK**. Complete the steps to be recorded. Click the **Stop Recording** button on the Developer tab.

**Run a Macro:** Click the **Developer** tab on the ribbon and click the **Macros** button. Select the macro and click **Run**.

**Edit a Macro:** Click the **Developer** tab on the ribbon and click the **Macros** button. Select a macro and click the **Edit** button. Make the necessary changes to the Visual Basic code and click the **Save** button.

**Delete a Macro:** Click the **Developer** tab on the ribbon and click the **Macros** button. Select a macro and click the **Delete** button.

**Macro Security:** Click the **Developer** tab on the ribbon and click the **Macro Security** button. Select a security level and click **OK**.

## Troubleshoot Formulas

### Common Formula Errors:

- ##### - The column isn't wide enough to display all cell data.
- #NAME? - The text in the formula isn't recognized.
- #VALUE! - There is an error with one or more formula arguments.
- #DIV/0 - The formula is trying to divide a value by 0.
- #REF! - The formula references a cell that no longer exists.

**Trace Precedents:** Click the cell containing the value you want to trace and click the **Formulas** tab on the ribbon. Click the **Trace Precedents** button to see which cells affect the value in the selected cell.

Jan	Feb	Total
6,010	7,010	13,020

**Error Checking:** Select a cell containing an error. Click the **Formulas** tab on the ribbon and click the **Error Checking** button in the Formula Auditing group. Use the dialog to locate and fix the error.

**The Watch Window:** Select the cell you want to watch. Click the **Formulas** tab on the ribbon and click the **Watch Window** button. Click the **Add Watch** button. Ensure the correct cell is identified and click **Add**.

**Evaluate a Formula:** Select a cell with a formula. Click the **Formulas** tab on the ribbon and click the **Evaluate Formula** button.

## Advanced Formatting

**Customize Conditional Formatting:** Click the **Conditional Formatting** button on the Home tab and select **New Rule**. Select a rule type, then edit the styles and values. Click **OK**.

**Edit a Conditional Formatting Rule:** Click the **Conditional Formatting** button on the Home tab and select **Manage Rules**. Select the rule you want to edit and click **Edit Rule**. Make your changes to the rule. Click **OK**.

**Change the Order of Conditional Formatting Rules:** Click the **Conditional Formatting** button on the Home tab and select **Manage Rules**. Select the rule you want to re-sequence. Click the **Move Up** or **Move Down** arrow until the rule is positioned correctly. Click **OK**.

## Analyze Data

**Goal Seek:** Click the **Data** tab on the ribbon. Click the **What-If Analysis** button and select **Goal Seek**. Specify the desired value for the given cell and which cell can be changed to reach the desired result. Click **OK**.

## Advanced Formulas

**Nested Functions:** A nested function is when one function is tucked inside another function as one of its arguments, like this:

**=IF(D2>AVERAGE(B2:B10),1,0)**  
 Initial Function: IF  
 Nested Function: AVERAGE

**IF:** Performs a logical test to return one value for a true result, and another for a false result.

**=IF(B2>69,"True","False")**

**logical\_test** that can be evaluated as true or false  
**value\_if\_true** value to return when the test is true  
**value\_if\_false** value to return when the test is false

**AND, OR, NOT:** Often used with IF to support multiple conditions.

- AND** requires multiple conditions.
- OR** accepts several different conditions.
- NOT** returns the opposite of the condition.

**=OR(B5="MN",B5="WI")**

**logical1** the first condition to evaluate  
**logical2** the second condition to evaluate

**SUMIF and AVERAGEIF:** Calculates cells that meet a condition.

- SUMIF** finds the total.
- AVERAGEIF** finds the average.

**=SUMIF(C6:C10,"MN",D6:D10)**

**range of cells** you want to apply criteria against  
**criteria** used to determine what cells to sum or average  
**calc\_range** to calculate, if different than the range

## Advanced Formulas

**VLOOKUP:** Looks for and retrieves data from a specific column in a table.

	A	B	C	D	E
1				Agent Sales	
2				5	7367
3					
4	Agent ID	First	Last	Packages	Sales
5	1	Joel	Nelson	6	6,602
6	2	Louis	Hay	7	8,246
7	3	Anton	Baril	11	13,683
8	4	Caroline	Jolie	12	14,108
9	5	Daniel	Ruiz	6	7,367

**=VLOOKUP(D2,A4:E10,5)**

**value to look for** in the first column of the table  
**table** from which to retrieve a value  
**col\_index** the column number in the table from which to retrieve a value

**HLOOKUP:** Looks for and retrieves data from a specific row in a table.

**=HLOOKUP(B5,B2:I3,3)**

**value to look for** in the first row of the table  
**table** from which to retrieve a value  
**row\_index** the row number in the table from which to retrieve a value

**UPPER, LOWER, and PROPER:** Changes how text is capitalized.

**UPPER Case | lower case | Proper Case**

**=UPPER(B4)**

**text** to change case or capitalization

**LEFT and RIGHT:** Extracts a given number of characters from the left or right.

**=LEFT(B5,3)**

**text** from which to extract characters  
**num\_chars** to extract from the left or right side of the text

**MID:** Extracts a given number of characters from the middle of text; the example below would return "day".

**=MID("Sunday",4,3)**

**text** from which to extract characters  
**start\_num** location of the first character to extract  
**num\_chars** the number of characters to extract

**MATCH:** Locates the position of a lookup value in a row or column.

**=MATCH("Dog",B2:B10)**

**lookup\_value** to match in the lookup\_array  
**lookup\_array** range of cells

**INDEX:** Returns a value or the reference to a value from within a range.

**=INDEX(A1:B5,2,2)**

**array** a range of cells  
**row\_num** the row position  
**col\_num** the column position (optional)