Intermediate Microsoft Excel 2019 Training

with examples and
hands-on exercises

WEBUCATOR

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The Author

Margaux Judge

Margaux Judge has worked as an e-learning editor and instructional designer for over ten years, writing and editing a wide variety of courses, from technical topics to soft skills. She has a Bachelor's degree in English and Textual Studies from Syracuse University and a Master's degree in Television Writing from Boston University.

Class Files

Download the class files used in this manual at https://static.webucator.com/media/public/materials/classfiles/EXC2019.2-1.1.5.zip.

Errata

Corrections to errors in the manual can be found at https://www.webucator.com/books/errata/.

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LESSON 1
Advanced Formulas

Topics Covered

☑ Naming and labeling cells and cell ranges.

☑ Names and labels in formulas.

☑ To create formulas that span multiple worksheets.

☑ IF function.

☑ PMT function.

☑ LOOKUP, VLOOKUP, and HLOOKUP functions.

☑ CONCAT function.

☑ TRANSPOSE function.

Evaluation Copy

☑ PROPER, UPPER, and LOWER functions.

☑ LEFT, RIGHT, and MID functions.

☑ Date functions.

Introduction

In this lesson, you will learn about naming and labeling cells and ranges of cells, to use names and labels in formulas, to create formulas that span multiple worksheets, and to use the conditional `IF` function and its variants in formulas. You will also learn to use the `PMT` function to calculate payments for loans, to use the `LOOKUP`, `VLOOKUP`, and `HLOOKUP` functions, to use the `CONCAT` function to join the contents of numerous cells, to use the `TRANSPOSE` function, to use the `PROPER`, `UPPER`, and `LOWER` functions to alter the casing of text, to use the `LEFT`, `RIGHT`, and `MID` functions to return characters from the start or end of a string, and to use various date functions.

1.1. Using Named Ranges in Formulas

In Microsoft Excel, cells and ranges of cells can be named. Reasons to name cells include:

1. Using names can make it easier to understand what a formula does (e.g., `=Q3Sales*Commission`).
2. Names work throughout a workbook, so using names can simplify the process of creating formulas that span multiple sheets.

Here is a list of things you need to know about cell names:

1. The first character of a name must be either a letter, a backslash (\), or an underscore (_).
2. Other (non-first) characters can be letters, numbers, underscores, or periods.
3. Spaces cannot be used.
4. The maximum number of characters in a name is 255.
5. Anything that could be a cell reference (e.g., **C10**, **$B$7**) cannot be used as a name.
6. Names are not case sensitive (e.g., the names "total", "Total", and "TOTAL" are the same in Excel).

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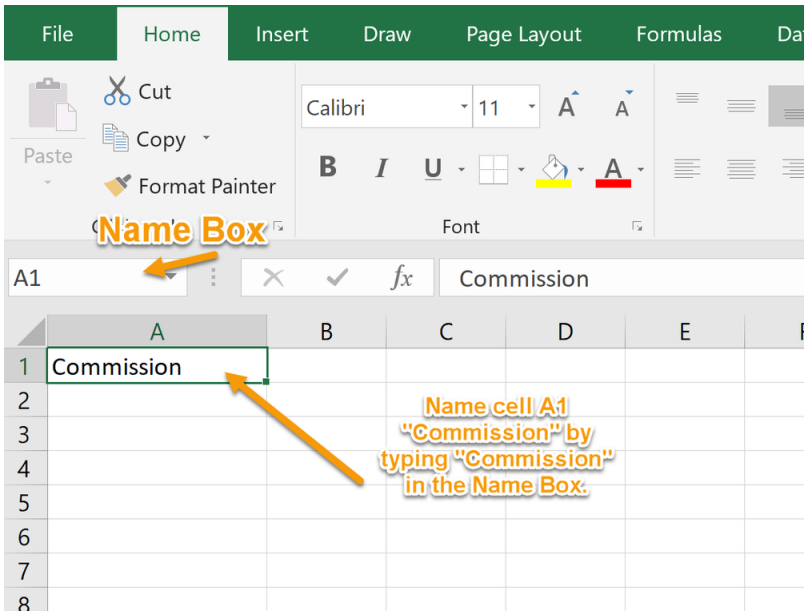
❖ 1.1.1. Naming a Single Cell

To name a cell:

1. Select the cell you wish to name.
2. In the **Name Box** (to the left of the formula bar), type the name:

EVALUATION COPY: Not to be used in class.

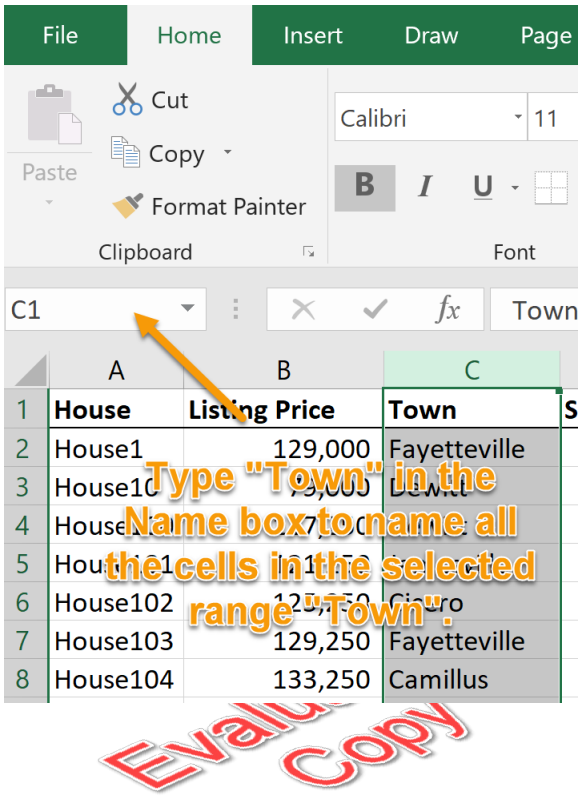


3. Press **Enter**.

❖ 1.1.2. Naming a Range of Cells

To name a range of cells:

1. Select the cells in the range you wish to name.
2. In the **Name Box** (to the left of the formula bar), type the name:

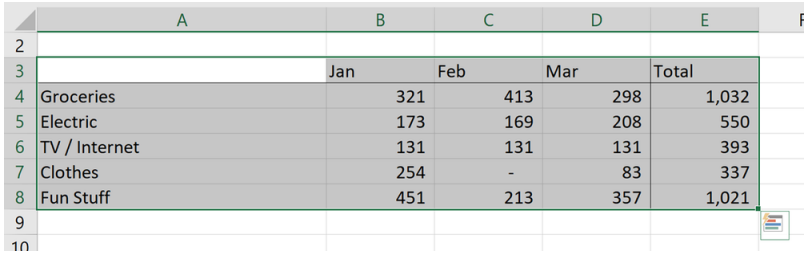


3. Press **Enter**.

❖ 1.1.3. Naming Multiple Single Cells Quickly

To quickly name cells using their row and column headings:

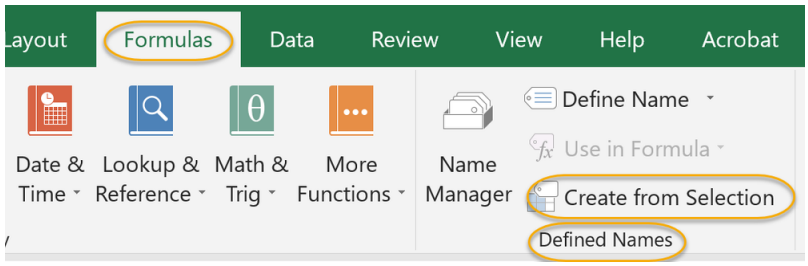
1. Select the rows and columns containing the range you wish to name:



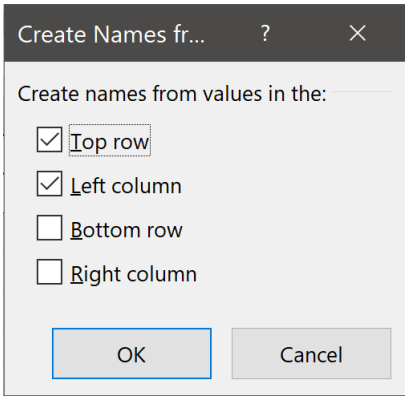
	Jan	Feb	Mar	Total
Groceries	321	413	298	1,032
Electric	173	169	208	550
TV / Internet	131	131	131	393
Clothes	254	-	83	337
Fun Stuff	451	213	357	1,021

2. On the **Formulas** tab, in the **Defined Names** group, click the **Create from Selection** command:

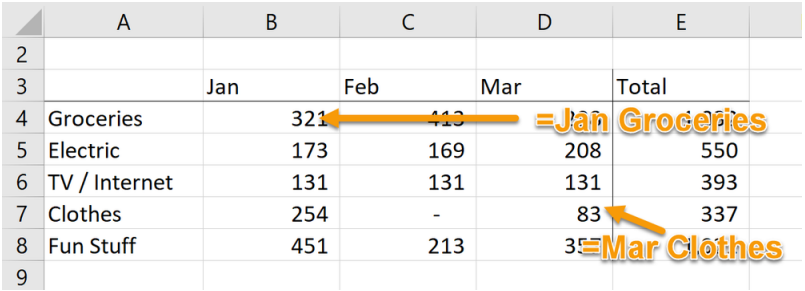
EVALUATION COPY: Not to be used in class.



3. In the **Create Names from Selection** dialog box, check the desired boxes and click **OK**:



4. In the following image, cells can now be referred to using the row and column headings:



	A	B	C	D	E
2					
3		Jan	Feb	Mar	Total
4	Groceries	321	413	[illegible]	[illegible]
5	Electric	173	169	208	550
6	TV / Internet	131	131	131	393
7	Clothes	254	-	83	337
8	Fun Stuff	451	213	35[illegible]	[illegible]
9					

Exercise 1: Using Named Ranges in Formulas

10 to 20 minutes

In this exercise, you will practice naming cells and will use named cells in a formula.

1. Open `Using Names.xlsx` from your `Excel2019.2/Exercises` folder.
2. Name cell **B1** "QuarterlyIncome".
3. Use the **Create from Selection** command to name cells in the range **A3:E8**.
4. Using only names in your formulas, answer the questions in column **A** of the worksheet.

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Hint

There can be no spaces in cell names. Either remove them (e.g. "QuarterlyIncome") or add an underscore (e.g., "Fun_Stuff").

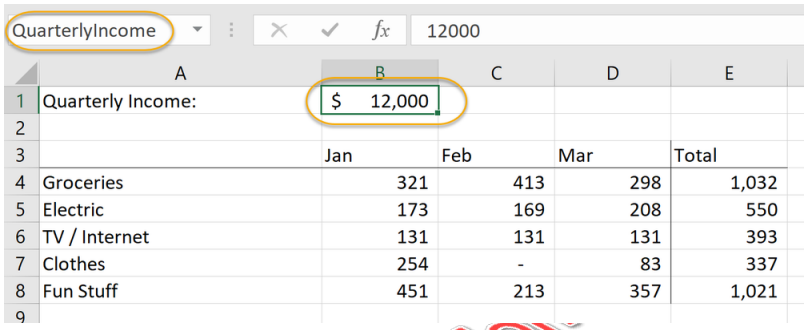
EVALUATION COPY: Not to be used in class.

Solution

1. To name cell **B1**:

   A. Select cell **B1**.

   B. Type "QuarterlyIncome" in the **Name Box** and press **Enter**:



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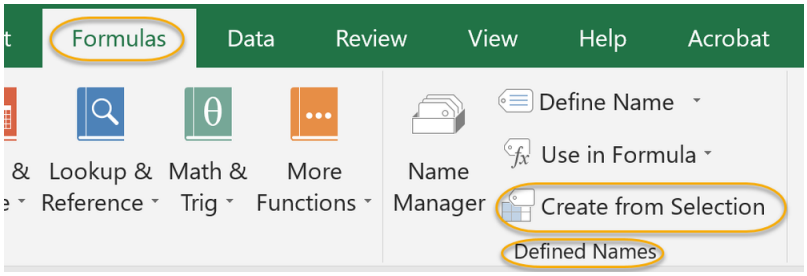
2. To name cells **A3:E8**:

   A. Select cells **A3:E8**.

   B. On the **Formulas** tab, in the **Defined Names** group, click the **Create from Selection** command:



   C. In the **Create Names from Selection** dialog box, check **Top row** and **Left column** and click **OK**:

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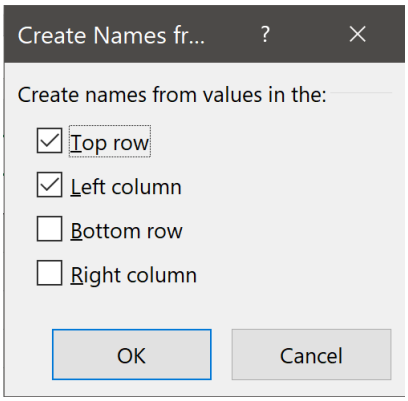

3. To answer the questions in column **A** of the worksheet:

   A. **How much was spent on Clothes and Fun Stuff in January?** Type "`=Jan Clothes+Jan Fun_Stuff`". The correct answer is 705.

   B. **How much was spent on Groceries in Jan and Mar?** Type "`=Jan Groceries+Mar Groceries`". The correct answer is 619.

   C. **What % of Quarterly Income did Electric account for from Jan to Mar?** Type "`=Total Electric/QuarterlyIncome`". The correct answer is 5%.

Evaluation Copy

1.2. Using Formulas That Span Multiple Worksheets

To create a formula that spans multiple worksheets:

1. If you haven't named cells, then:

   A. Select the sheet and cell into which you wish to type the formula.

   B. Type "`=`".

   C. Select the sheet that includes the data you will use in your formula.

   D. Select the cell that contains the data.

   E. Enter an operator (`+`, `-`, `*`, `/`).

   F. Either select another cell in that sheet or select another sheet and cell to complete the formula.

2. If your formula contains named cells or ranges, simply:

   A. Select the sheet and cell into which you wish to type the formula.

B. Type "=".

C. Enter the formula using names.

Evaluation Copy

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Exercise 2: Entering a Formula Using Data in Multiple Worksheets

10 to 20 minutes

In this exercise, you will enter a formula using data from multiple sheets first without names and then using named cells.

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1. Open `Multiple Worksheets.xlsx` from your `Excel2019.2/Exercises` folder.
2. Answer the questions in rows 3, 4, and 5 of **Sheet2** using the data in **Sheet1** *without using named cells*.
3. Answer the questions in rows 10, 11, and 12 of **Sheet2** using the data in **Sheet1** *using named cells*. **Note**: The cells are already named.

Solution

1. To answer the questions in rows 3, 4, and 5:

   A. **How much was spent on Clothes and Fun Stuff in January?**

      i. Type "=".
      ii. Select **Sheet1** by clicking it.
      iii. Select cell **B7**.
      iv. Type "+".
      v. Select cell **B8**.
      vi. Press **Enter**.
      vii. The formula you entered will read: "`=Sheet1!B7+Sheet1!B8`".

   B. **How much was spent on Groceries in Jan and Mar?**

      i. Type "=".
      ii. Select **Sheet1** by clicking it.
      iii. Select cell **B4**.
      iv. Type "+".
      v. Select cell **D4**.
      vi. Press **Enter**.
      vii. The formula you entered will read: "`=Sheet1!B4+Sheet1!D4`".

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   C. **What percent of Quarterly Income did Electric account for from Jan to Mar?**

      i. Type "=".
      ii. Select **Sheet1** by clicking it.
      iii. Select cell **E5**.
      iv. Type "/".
      v. Select cell **B1**.
      vi. Press **Enter**.
      vii. The formula you entered will read: "`=Sheet1!E5/QuarterlyIncome`".

2. To answer the questions in rows 10, 11, and 12:

   A. **How much was spent on Clothes and Fun Stuff in January?** Type "`=Jan Clothes+Jan Fun_Stuff`".

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B. **How much was spent on Groceries in Jan and Mar?** Type "`=Jan Groceries+Mar Groceries`".

C. **What percent of Quarterly Income did Electric account for from Jan to Mar?** Type "`=Total Electric/QuarterlyIncome`".

1.3. Using the IF Function

The `IF` function can be used to execute formulas only under certain conditions or to execute different formulas based on specified conditions. This is known as conditional logic. To use the `IF` function, you need to know:

1. **Logical Test**. This is simply the thing you want to test. For example:
   A. If the number is greater than 10, then...
   B. If the value is "blue", then...
2. **Value if True**. This is the value to return if the requirement is met (the logical test is true).
3. **Value if False**. This is the value to return if the requirement is not met (the logical test is false).

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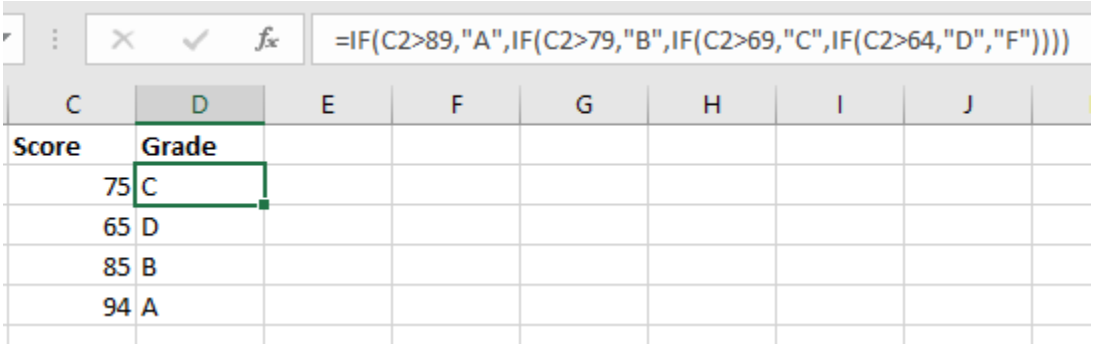
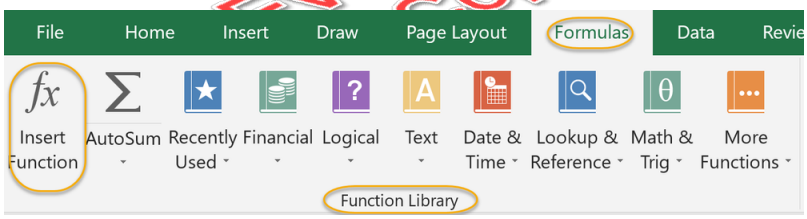
Here are some things to know about the `IF` function:

1. In plain English, the `IF` function says: If X condition is true, put Y value in this cell; otherwise, put Z value in the cell.
2. The value returned by the `IF` function can be a number, text, a formula, or a reference to another cell.
3. Enter "" (open and close quotes) if you do not wish to return a value.
4. You can test up to seven conditions by nesting `IF` functions within the original `IF` function. Here is an example in which nested `IF` functions are used to return grades:



To use the `IF` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



2. In the **Insert Function** dialog box:
   A. Search on "IF" or, in the **Or select a category** drop-down box, select **Logical**.
   B. Under **Select a function**, select **IF**.
   C. Click **OK**.

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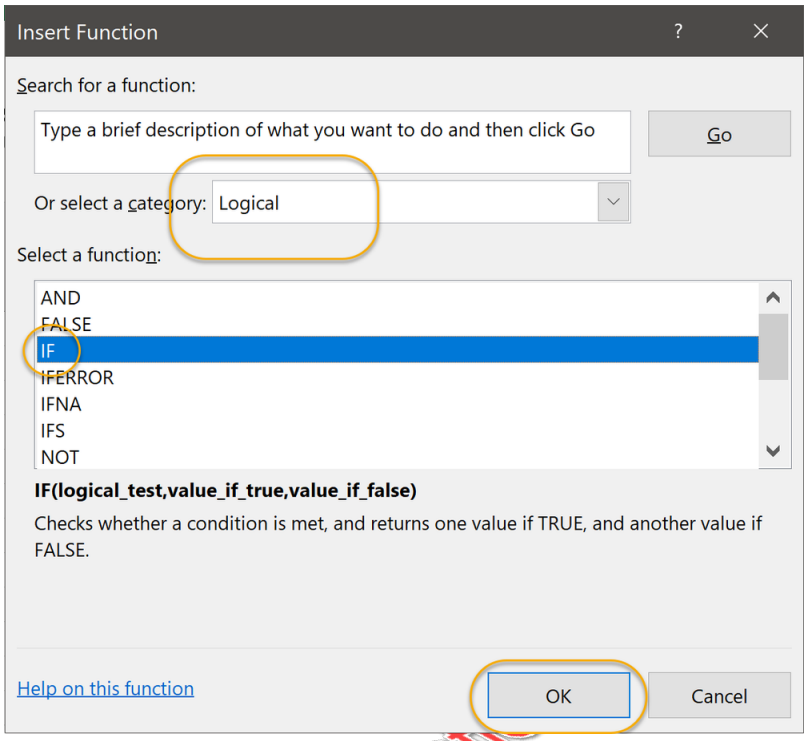

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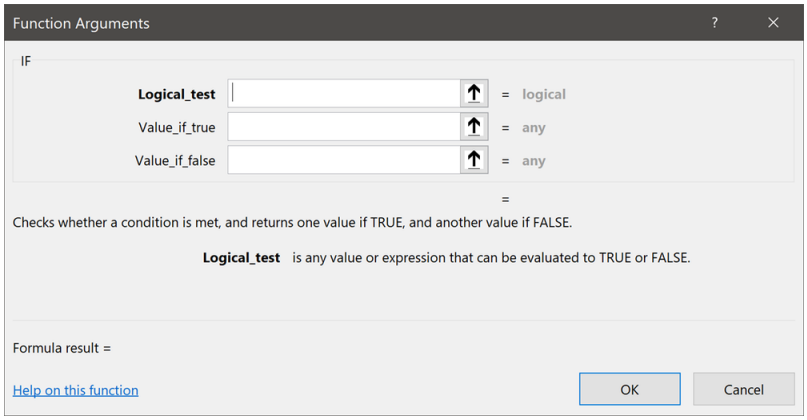
3. In the **Function Arguments** dialog box:
   A. Enter the logical test (e.g., `B2>10`, `B2<C2`, `B2="Blue"`).
   B. Type in the value if true.
   C. Type in the value if false.
   D. Click **OK**.



❖ 1.3.1. Using AND/OR Functions

The `AND` and `OR` functions are similar to the IF function in that they are logical functions.

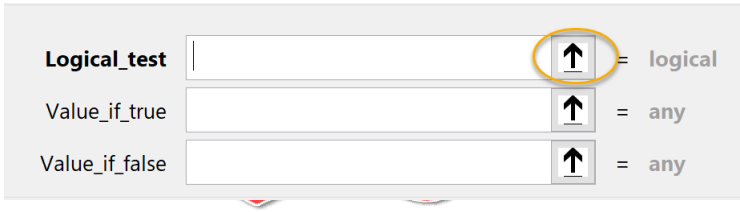
The syntax of the AND function is: `=AND(logical1,logical2, ...)`. It returns `TRUE` if all arguments are true.

The syntax of the OR function is: `=OR(logical1,logical2, ...)`. It returns `TRUE` if any arguments are true.

Tip

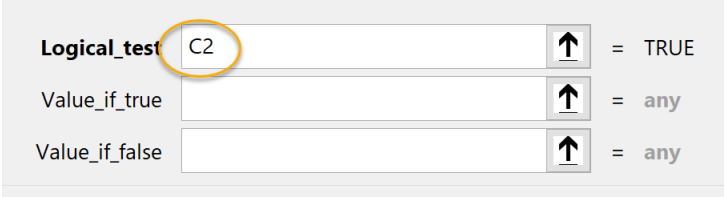
Note that when you see a small picture of a worksheet with a black arrow on it next to a data entry field, you can click this image to select a cell, rather than typing the cell's location into the data entry field. For example:

1. Click the circled image:



2. The **Function Arguments** dialog box opens up. Click a cell and the cell's location appears in the **Function Arguments** dialog box. Click the image to the far right of the **Function Arguments** dialog box to return to the previous dialog box:

3. Note that in the original dialog box, the selected cell's location has been added into the data entry field:



This is especially useful when referring to cells on a separate worksheet.

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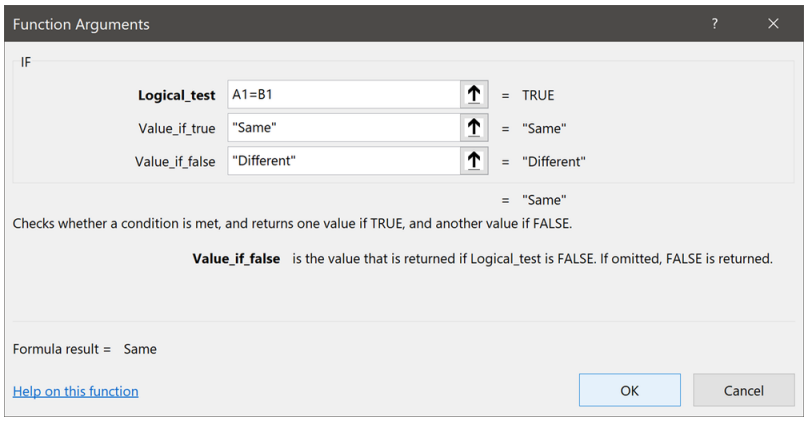
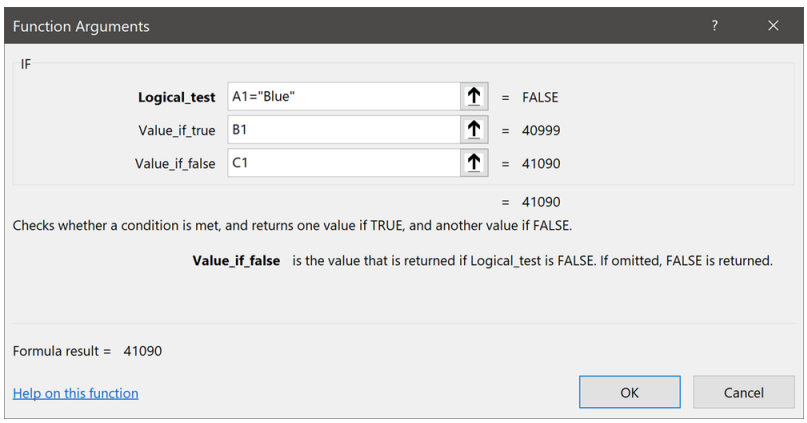
Here are some examples of the `IF` statement in use:

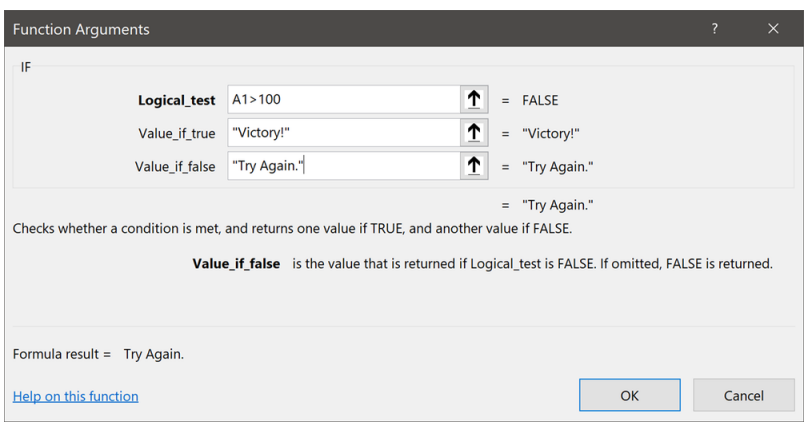
1. `=IF(A1=B1,"Same","Different"):`



2. `=IF(A1="Blue",B1,C1):`



3. `=IF(A1>100,"Victory!","Try again."):`



❖ 1.3.2. Using the SUMIF, AVERAGEIF, and COUNTIF Functions

SUMIF

There are a few variations of the IF function that may be useful to be aware of when working with Excel.

The `SUMIF` function is a variation of the `IF` function, which allows you to specify criteria for a sum. For example, you may want to sum only the numbers in a column that are above 100.

To use `SUMIF`, you need to know:

1. **range**. The range of cells to which you want to apply the criteria.
2. **criteria**. This can be text, numbers, a function, or an expression. For example, the criteria could be > 100.

AVERAGEIF

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`AVERAGEIF` does what it sounds like: it averages a range of cells. For example, you could average students' grades in a spreadsheet.

To use `AVERAGEIF`, you need to know:

1. **range**. Enter a range of at least two cells to which to apply the criteria.
2. **criteria**. The criteria defines what is to be averaged.

COUNTIF

The `COUNTIF` function allows you to count the number of cells in a range that meet the criteria you specify. For example, you can count the number of students who received As.

To use the COUNTIF function, you need to know:

1. **range**. Enter a range of at least two cells to which to apply the criteria.
2. **criteria**. The criteria defines what is to be averaged, such as numbers, expressions, and text.

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Exercise 3: Using the IF Function

15 to 25 minutes

In this exercise, you will practice using the `IF` function.

1. Open `Functions.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**IF**".
2. Use the `IF` function to enter "Yes" or "No" in column **E** based on whether revenue from each customer exceeded $10,000 (i.e., if revenue exceeded $10,000, enter "Yes"; otherwise, enter "No").
3. Use the `IF` function to enter "Yes" or "No" in column **F** based on whether the number of purchases from each customer was greater than or equal to 20 (i.e., if # of purchases exceeded 19, enter "Yes"; otherwise, enter "No".)
4. Use the `IF` function to enter the revenue received from customers located in Utica, and only Utica, in column **G** (i.e., if the customer is located in Utica, enter revenue; otherwise, leave blank).

Evaluation Copy

Solution

1. Use the `IF` function to enter "Yes" or "No" in column **E** based on whether revenue from each customer exceeded $10,000.

   A. The information you need to enter this formula is:

      i. Logical Test: If revenue is greater than $10,000, then…

      ii. Value if True: "Yes"

      iii. Value if False: "No"

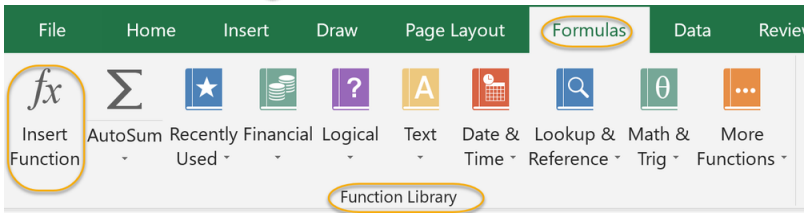
   B. The formula is: `=IF(B2>10000,"Yes","No")`

   C. Enter the formula using the **Insert Function** command:

      i. Select cell **E2**.

      ii. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

Evaluation Copy



      iii. In the **Insert Function** dialog box:

         a. Search on "IF" or, in the **Or select a category** drop-down box, select **Logical**.

         b. Under **Select a function**, select **IF**.

         c. Click **OK**.

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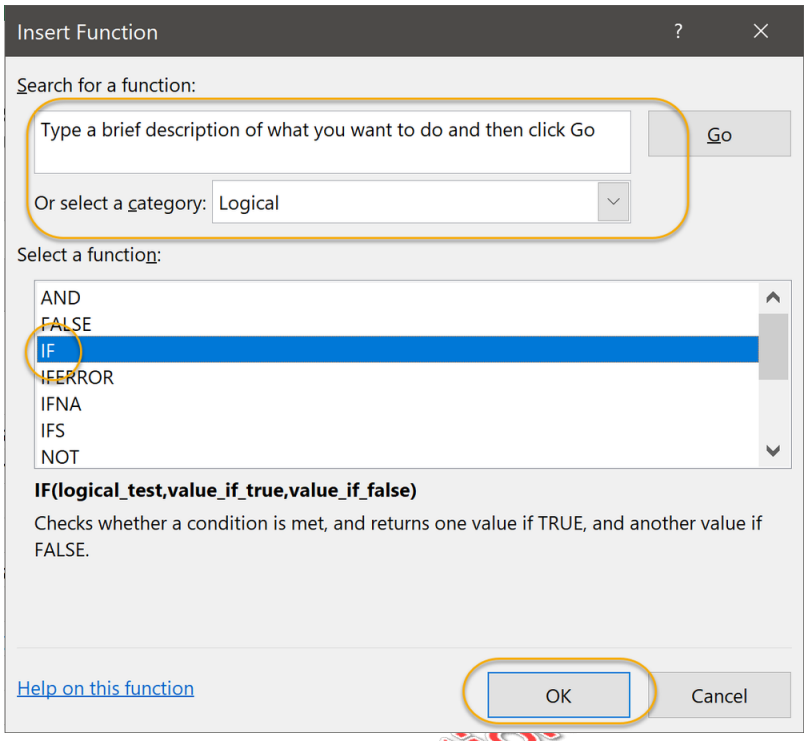


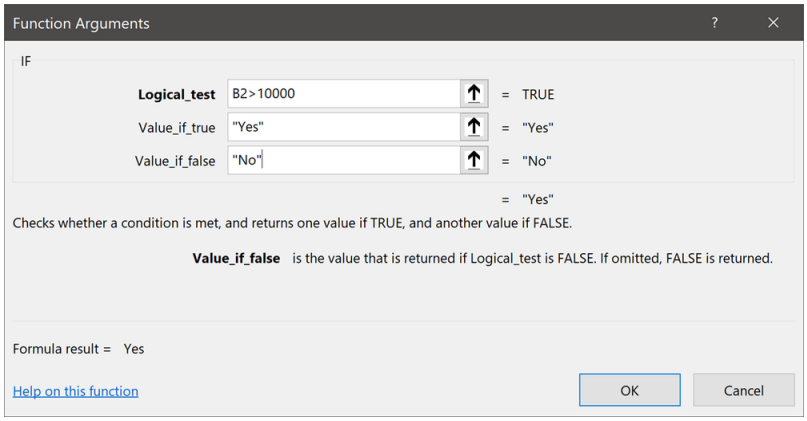
Evaluation Copy

iv. In the **Function Arguments** dialog box, enter the following values and click **OK**:

a. **Logical_test**: **B2>10000**

b. **Value_if_true**: "**Yes**"

c. **Value_if_false**: "**No**"



v. Copy the formula from cell **E2** to cells **E3:E8**.

2. Use the `IF` function to enter "Yes" or "No" in column **F** based on whether the number of purchases from each customer was greater than or equal to 20.

   A. The information you need to enter this formula is:

      i. Logical Test: If the number of purchases is greater than 19, then…

      ii. Value if True: "Yes"

      iii. Value if False: "No"

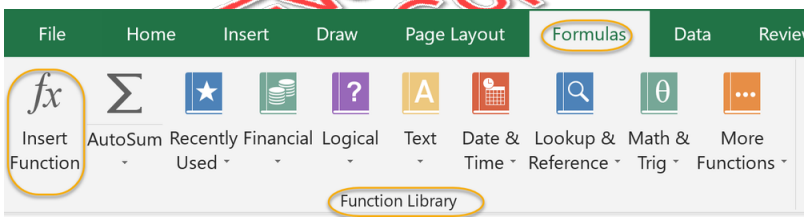
   B. The formula is: `=IF(C2>19,"Yes","No")`

   C. Enter the formula using the **Insert Function** command:

      i. Select cell **F2**.

      ii. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

Evaluation Copy



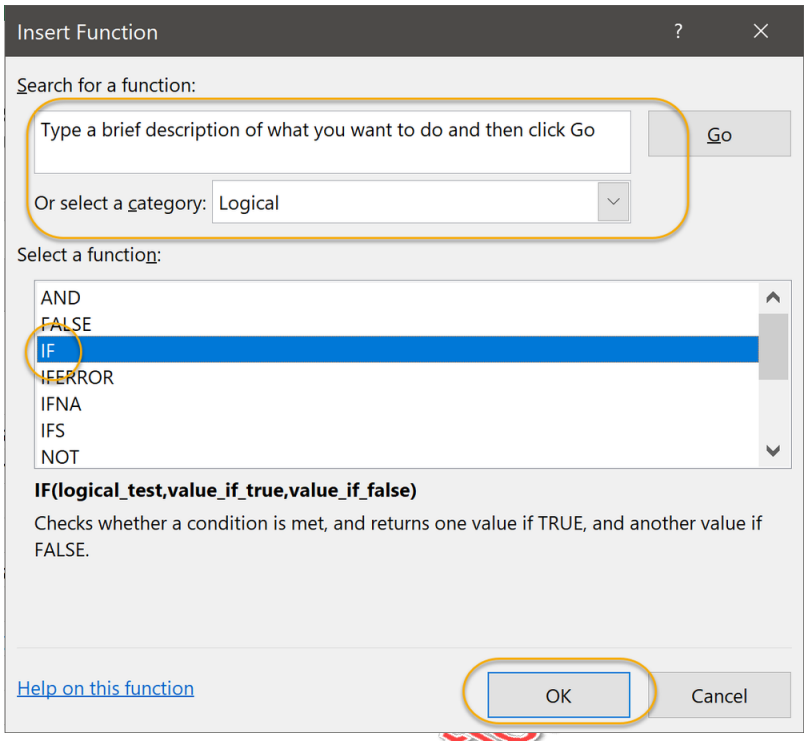
      iii. In the **Insert Function** dialog box:

         a. Search on "IF" or, in the **Or select a category** drop-down box, select **Logical**.

         b. Under **Select a function**, select **IF**.

         c. Click **OK**.

EVALUATION COPY: Not to be used in class.



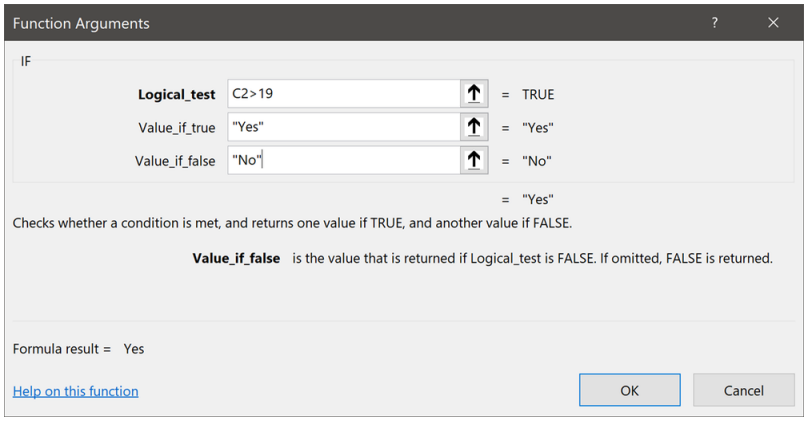
Evaluation Copy

iv. In the **Function Arguments** dialog box, enter the following values and click **OK**:

a. **Logical_test**: **C2>19**

b. **Value_if_true**: "**Yes**"

c. **Value_if_false**: "**No**"



v. Copy the formula from cell **F2** to cells **F3:F8**.

3. Use the `IF` function to enter the revenue received from customers located in Utica, and only Utica, in column **G**.

   A. The information you need to enter this formula is:

      i. Logical Test: If city is Utica, then…

      ii. Value if True: Revenue (**B2**)

      iii. Value if False: None ("")

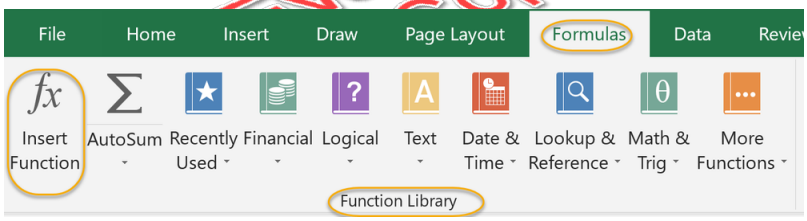
   B. The formula is: `=IF(D2="Utica",B2,"")`

   C. Enter the formula using the **Insert Function** command:

      i. Select cell **G2**.

      ii. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

Evaluation Copy



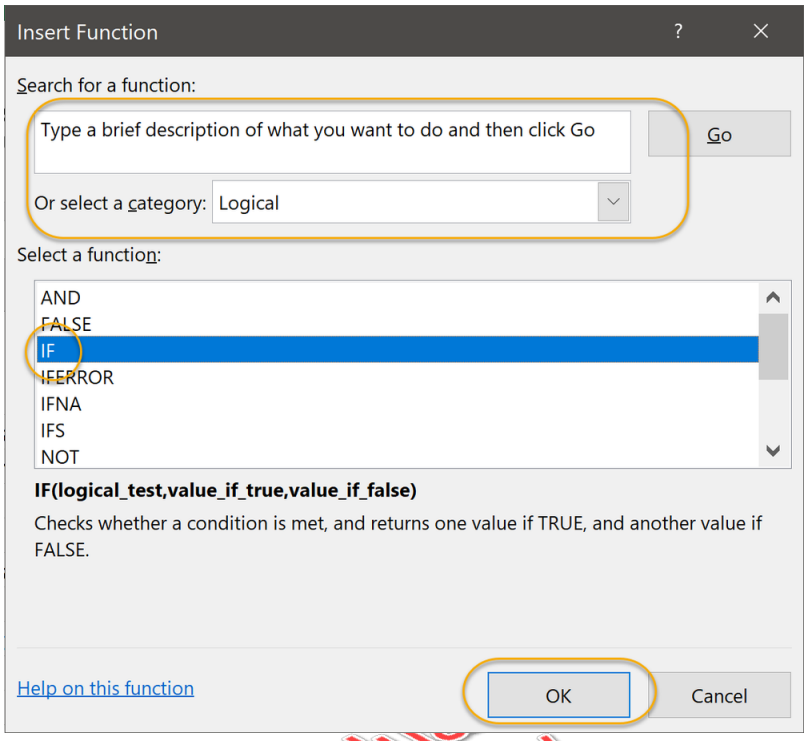
      iii. In the **Insert Function** dialog box:

         a. Search on "IF" or, in the **Or select a category** drop-down box, select **Logical**.

         b. Under **Select a function**, select **IF**.

         c. Click **OK**.

EVALUATION COPY: Not to be used in class.



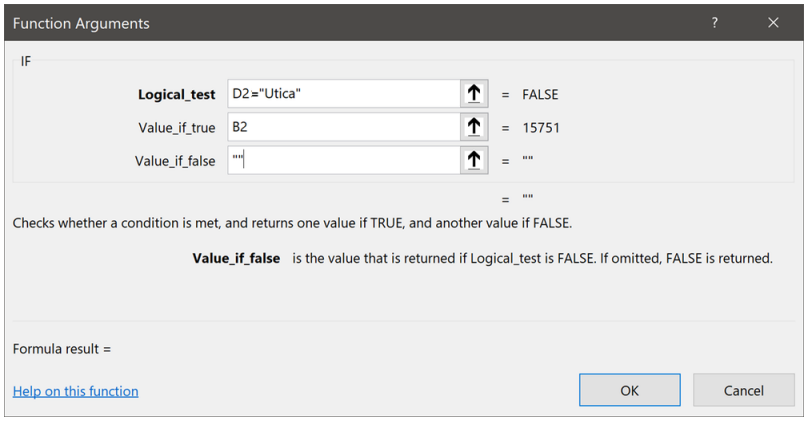
Evaluation Copy

iv. In the **Function Arguments** dialog box, enter the following values and click **OK**:

a. **Logical_test**: **D2="Utica"**

b. **Value_if_true**: **B2**

c. **Value_if_false**: **""**



v. Copy the formula from cell **G2** to cells **G3:G8**.

1.4. Using the PMT Function

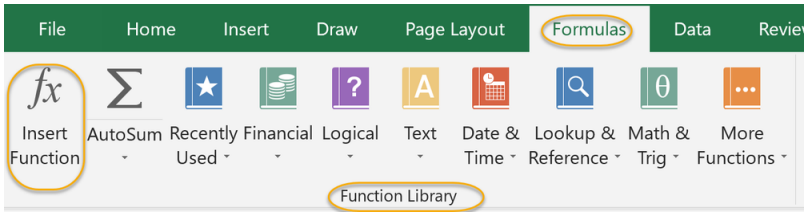
The `PMT` function is used to calculate payments on loans. In order to use the `PMT` function, you need to know:

1. **Rate**. The interest rate.
2. **Nper**. The number of payments.
3. **Pv**. The present value of the future payments, or the amount of the loan.
4. **Fv**. The future value, or the cash balance after the final payment has been made. NOTE: the cash balance is not the remaining balance of the loan. Instead, it is the cash on hand after the loan is paid off. If the loan won't be completely paid off, then the future value is a negative number.
5. **Type**. Whether the payments are made at the beginning or end of each period.

Evaluation Copy

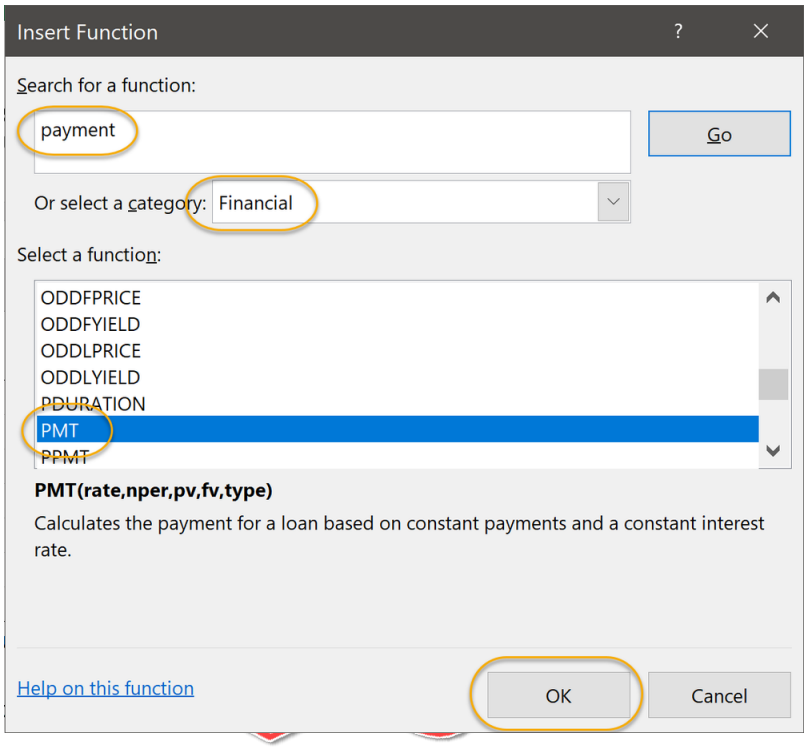
To use the `PMT` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

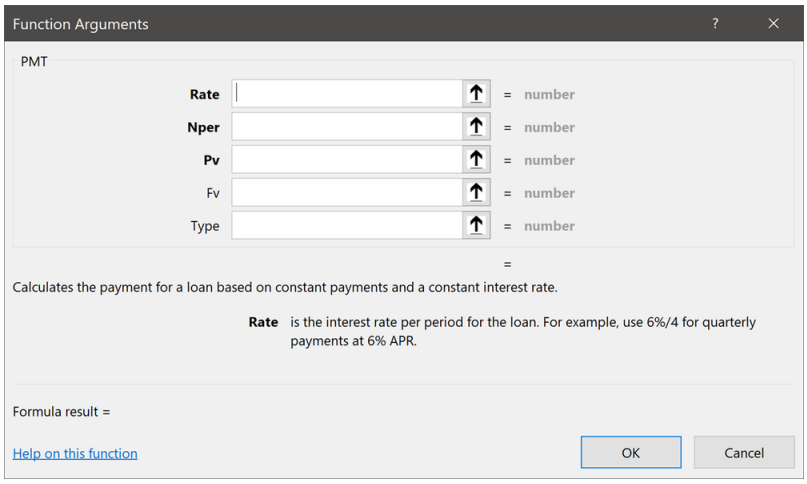


2. In the **Insert Function** dialog box:
   A. Search on "Payment" or, in the **Or select a category** drop-down box, select **Financial**.
   B. Under **Select a function**, select **PMT**.
   C. Click **OK**.

EVALUATION COPY: Not to be used in class.



3. In the **Function Arguments** dialog box:
   A. Enter the interest rate (**Rate**) or the cell in which it is located. If your worksheet contains the annual interest rate and payments will be made monthly, then select the annual rate and divide by 12.
   B. Enter the number of payments (**Nper**).
   C. Enter the present value (**Pv**).
   D. Enter the future value (**Fv**). If you leave this blank, Excel will assume the future value is $0.
   E. For **Type**, enter "0" if payments are made at the end of the period and "1" if payments are made at the beginning of the period. If you leave this blank, Excel will assume payments are made at the end of the period.
   F. Click **OK**.

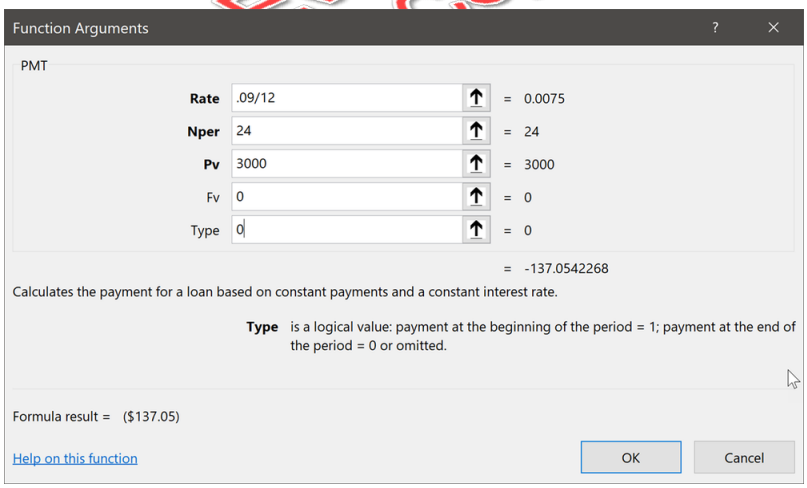


Here are some examples:

1. To calculate a 24-month $3,000 loan with 9% interest, assuming the loan is to be completely paid off and payments are made at the end of each period:

   A. `=PMT(0.09/12,24,3000,0,0)` or `=PMT(0.09/12,24,3000)`:

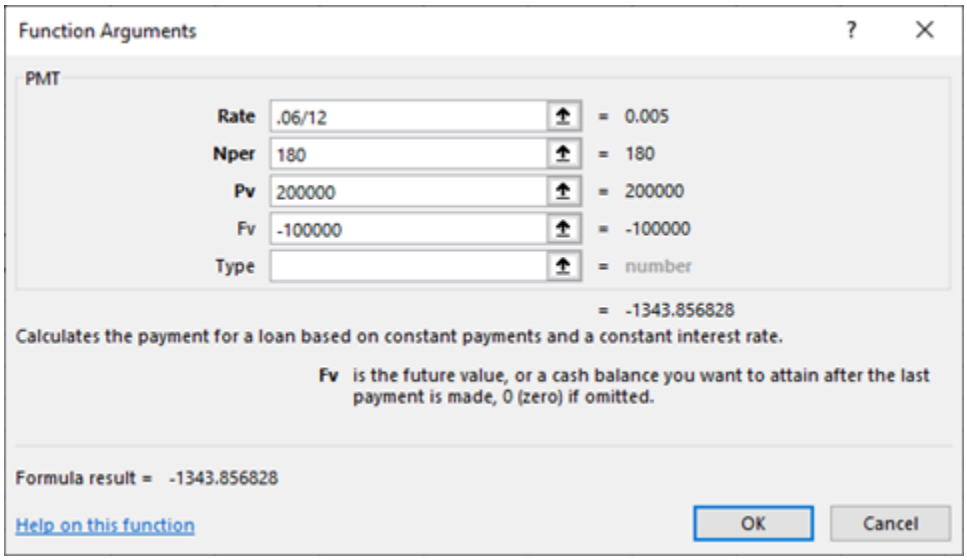
Evaluation Copy



2. To calculate a 15-year $200,000 loan with 6% interest, assuming half the loan is to be paid off and payments are made at the end of each period:

   A. `=PMT(0.06/12,180,200000,-100000)`:

EVALUATION COPY: Not to be used in class.



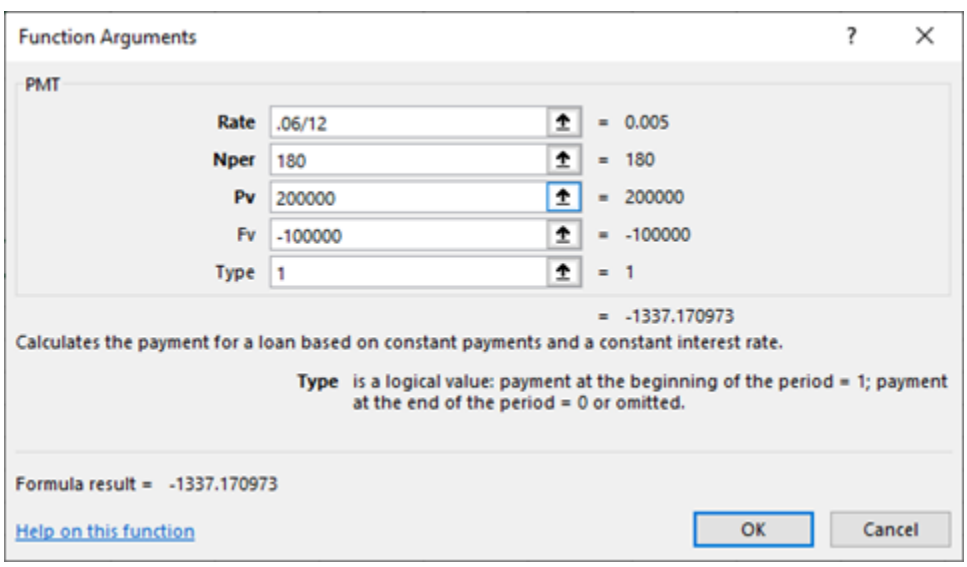
Math Note

15 years = 180 months.

Evaluation Copy

3. To calculate a 15-year $200,000 loan with 6% interest, assuming half the loan is to be paid off and payments are made at the beginning of each period:

   A. `=PMT(0.06/12,180,200000,-100000,1)`:



Exercise 4: Using the PMT Function

15 to 25 minutes

In this exercise, you will...

1. Open `Functions.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**PMT**".
2. Calculate the payments for Loans 1, 2, 3, and 4.
3. Assume you purchased a house for $240,000 and took out a 30-year mortgage for the whole amount with an interest rate of 6%. What is your payment? Enter the formula in cell **B9**.
4. Assume you purchased a car for $29,000 and took out a loan for the whole amount with an interest rate of 9%. You are to pay off $20,000 of the loan in 4 years. Payments are to be made at the beginning of each period. What is your payment? Enter the formula in cell **B10**.

Evaluation Copy

EVALUATION COPY: Not to be used in class.

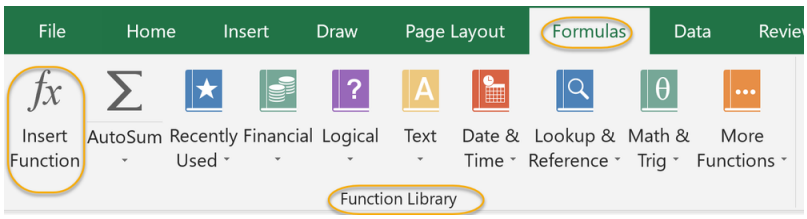
Solution

1. Loan 1:

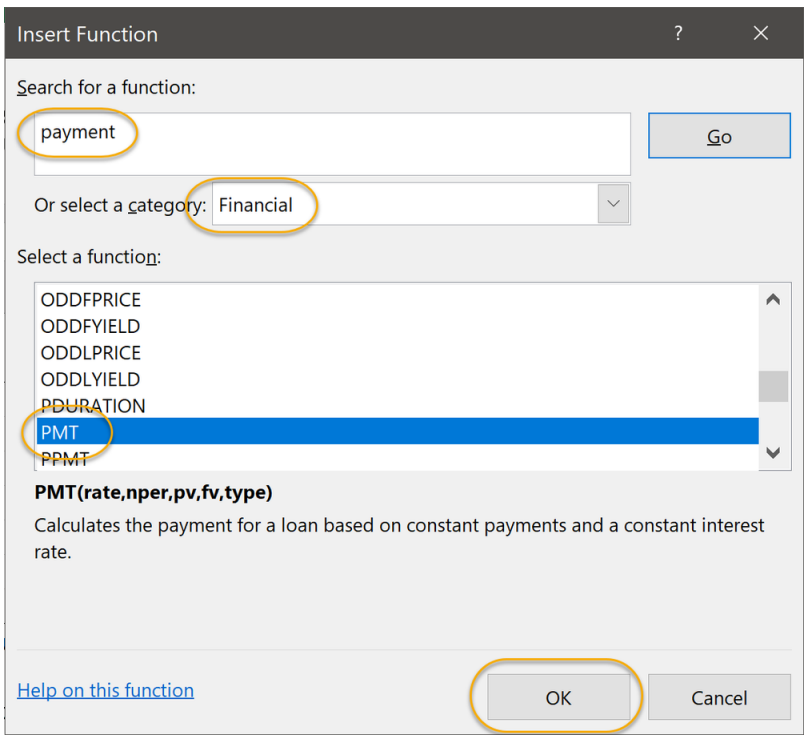
   A. Formula: `"=PMT(C2/12,D2,B2,E2)"`

   B. Solution:

      i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



      ii. In the **Insert Function** dialog box, select **PMT** and click **OK**:



      iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

         a. **Rate**: **C2/12**

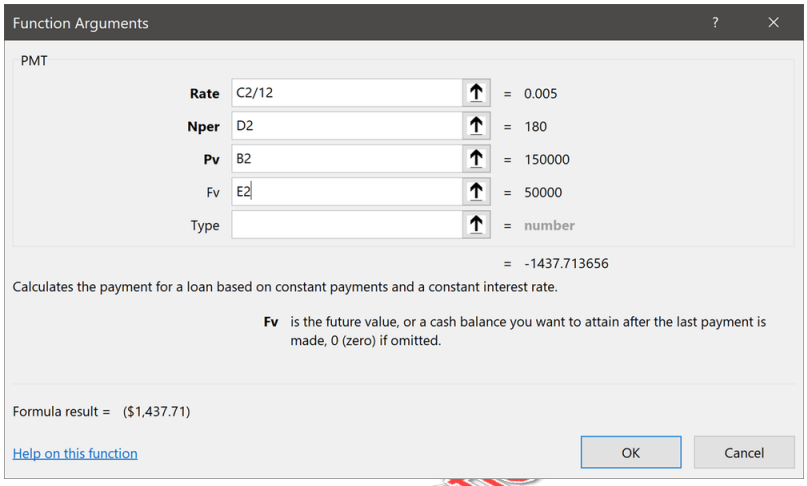
         b. **Nper**: **D2**

EVALUATION COPY: Not to be used in class.

c. **Pv**: **B2**

d. **Fv**: **E2**

e. **Type**: Leave blank.



Evaluation Copy

2. Loan 2:

A. Formula: `"=PMT(C3/12,D3,B3)"`

B. Solution:

i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

ii. In the **Insert Function** dialog box, select **PMT** and click **OK**.

iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

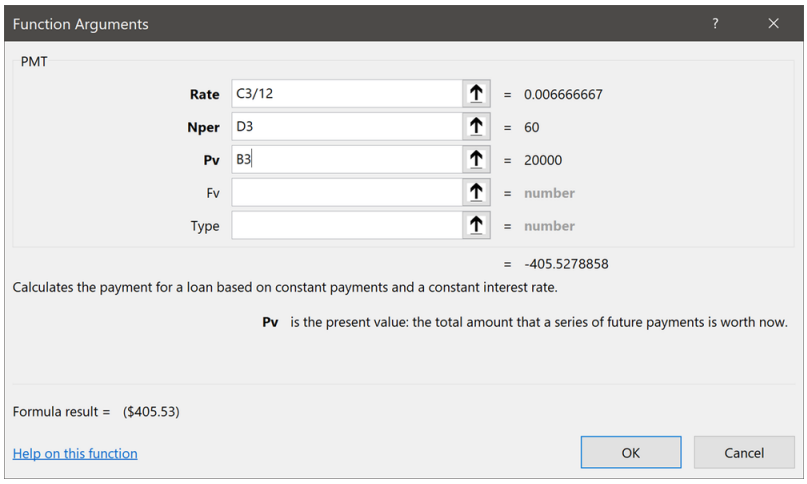
a. **Rate**: **C3/12**

b. **Nper**: **D3**

c. **Pv**: **B3**

d. **Fv**: Leave blank.

e. **Type**: Leave blank.



3. Loan 3:

Evaluation Copy

   A. Formula: "=PMT(C4/12,D4,B4)"

   B. Solution:

      i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

      ii. In the **Insert Function** dialog box, select **PMT** and click **OK**.

      iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

         a. **Rate**: **C4/12**

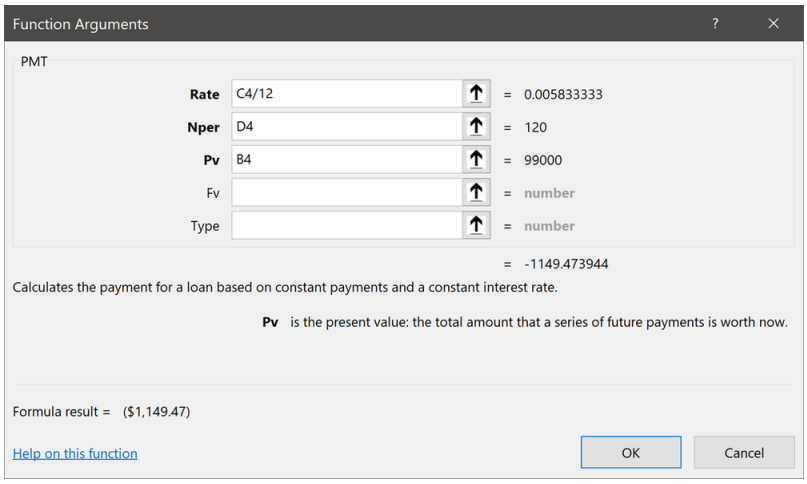
         b. **Nper**: **D4**

         c. **Pv**: **B4**

         d. **Fv**: Leave blank.

         e. **Type**: Leave blank.

EVALUATION COPY: Not to be used in class.



Evaluation Copy

4. Loan 4:

   A. Formula: "=PMT(C5/12,D5,B5,E5,1)"

   B. Solution:

      i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

      ii. In the **Insert Function** dialog box, select **PMT** and click **OK**.

      iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

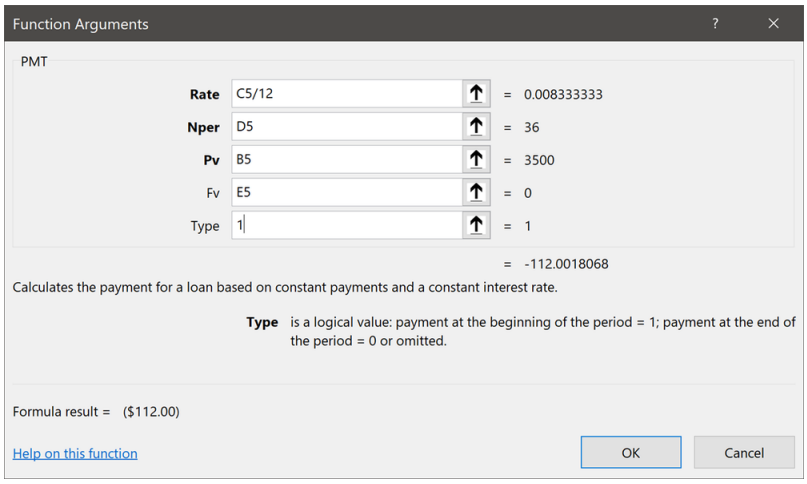
         a. **Rate**: **C5/12**

         b. **Nper**: **D5**

         c. **Pv**: **B5**

         d. **Fv**: **E5**

         e. **Type**: **1**.



5. Assume you purchased a house for $240,000 and took out a 30-year mortgage for the whole amount with an interest rate of 6%. What is your payment?

Evaluation Copy

   A. The formula is: `=PMT(0.06/12,360,240000)`

   B. To solve this using the **Insert Function** command:

      i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

      ii. In the **Insert Function** dialog box, select **PMT** and click **OK**.

      iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

         a. **Rate**: **0.06/12**

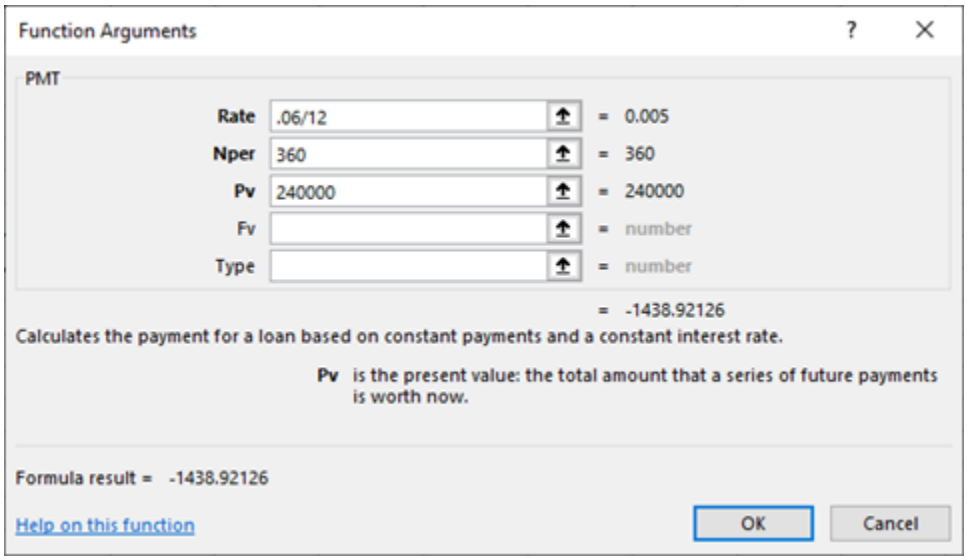
         b. **Nper**: **360**

         c. **Pv**: **240000**

         d. **Fv**: Leave blank.

         e. **Type**: Leave blank.

EVALUATION COPY: Not to be used in class.



Evaluation Copy

6. Assume you purchased a car for $29,000 and took out a loan for the whole amount with an interest rate of 9%. You are to pay off $20,000 of the loan in 4 years. Payments are to be made at the beginning of each period. What is your payment?

   A. Formula: `=PMT(0.09/12,48,29000,9000,1)`

   B. To solve this using the **Insert Function** command:

      i. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

      ii. In the **Insert Function** dialog box, select **PMT** and click **OK**.

      iii. In the **Function Arguments** dialog box, enter the following values and click **OK**:

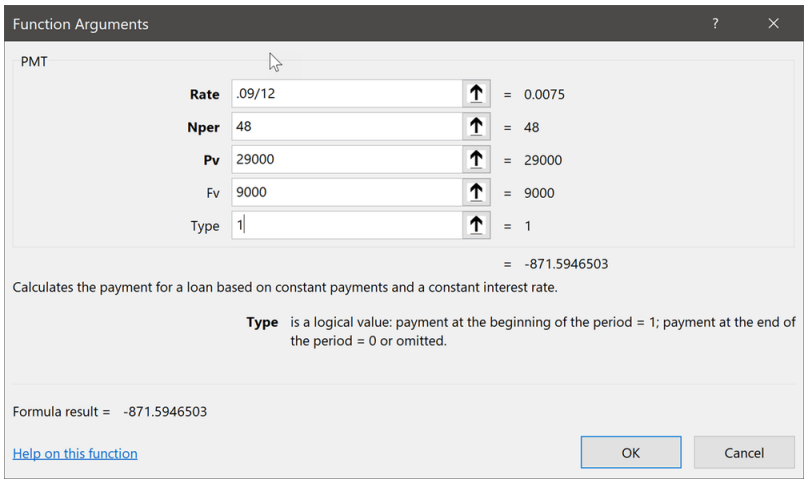
         a. **Rate**: **0.09/12**

         b. **Nper**: **48**

         c. **Pv**: **29000**

         d. **Fv**: **9000**

         e. **Type**: **1**.



1.5. Using the LOOKUP Function

Evaluation Copy

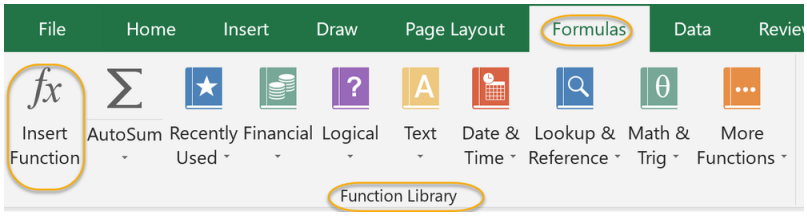
The LOOKUP function is used to pull a value from a range that is one row or one column, or from an array. It has two syntaxes: vector and array.

To use the LOOKUP function, you need to know:

1. **Lookup value**. The value you will use to identify individual records in your table.
2. **Lookup vector**. For a vector syntax, this will be a range that contains one row or column.
3. **Array**. For an array syntax, this is the range you want to compare with the lookup value.

To use the LOOKUP function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



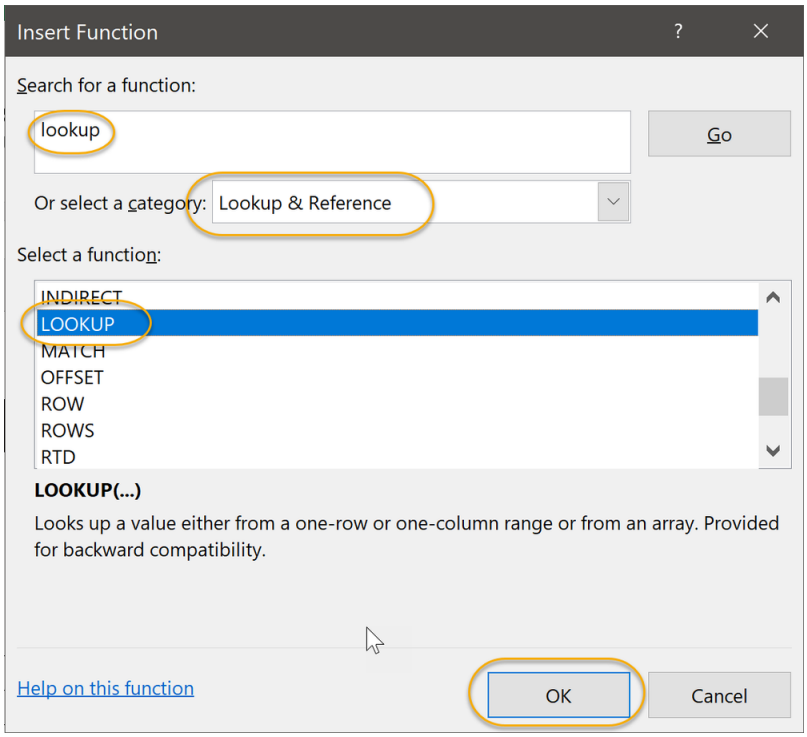
2. In the **Insert Function** dialog box:

EVALUATION COPY: Not to be used in class.

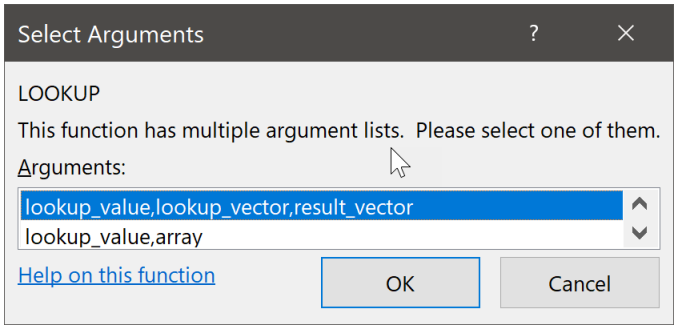
A. Search on "LOOKUP" or, in the **Or select a category** drop-down box, select **Lookup & Reference**.

B. Under **Select a function**, select **LOOKUP**.

C. Click **OK**.



D. In the **Select Arguments** dialog box, choose a vector or array syntax and click **OK**.



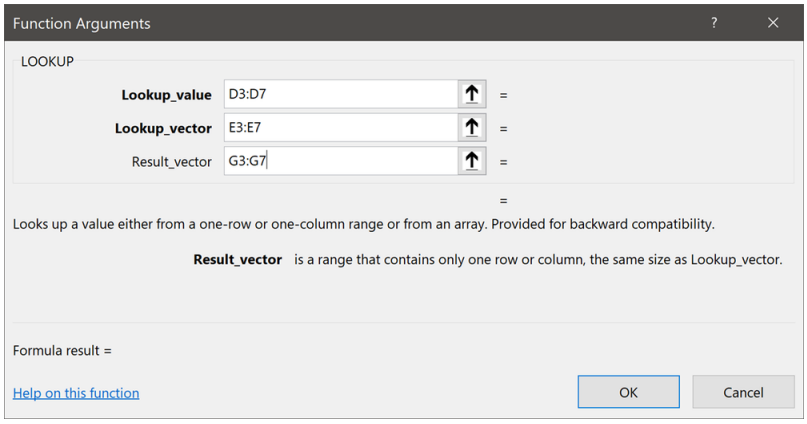
3. In the **Function Arguments** dialog box (the following is for a vector):

A. Enter the **Lookup_value**.

B. Enter the **Lookup_vector**.

C. Enter the **Result_vector**.

D. Click **OK**.



1.6. Using the VLOOKUP Function

The `VLOOKUP` function is used to pull a value from a list or table based on a corresponding value. For example, if you have a worksheet with a table showing employee names, hire date, and salary, you could use `VLOOKUP` in a separate worksheet to pull the hire date and salary for individual employees from the first worksheet. In this example, the employee name serves as a key, identifying which information from the first worksheet you wish to pull.

Evaluation Copy

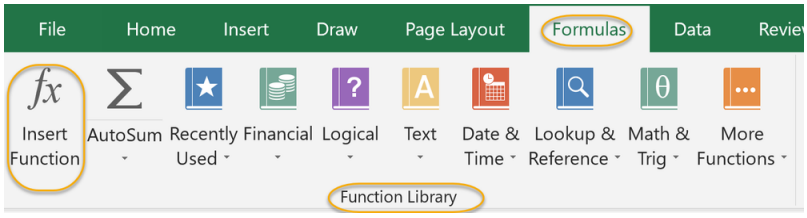
To use the `VLOOKUP` function, you need to know:

1. **Lookup value**. The value you will use to identify individual records in your table. The *Lookup Value* must be in the left-most column of your table.
2. **Table array**. The table that contains the data you will use `VLOOKUP` to retrieve. This table can be in another worksheet or even another workbook from the one in which you enter the `VLOOKUP` function.
3. **Col index num**. The *Lookup Value* is always in the left-most column of the *Table Array* (column #1, regardless of where in the worksheet the table is located). The next column to the right is column #2, then column #3, etc. The *Col index num* is simply the number of the column that contains the value you wish to retrieve.
4. **Range lookup**. Enter *False* if the *Lookup Value* must match exactly. If you enter *True* or leave blank, Excel will assume the table is sorted in ascending order and will select the best match. Note that if the table is not sorted in ascending order, Excel likely won't correctly find the best match.

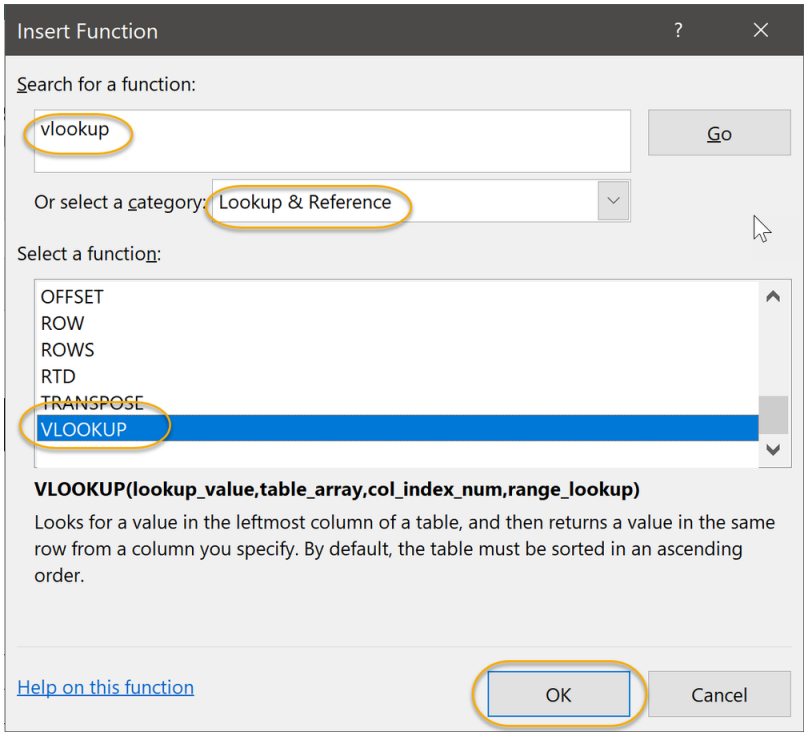
EVALUATION COPY: Not to be used in class.

To use the `VLOOKUP` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



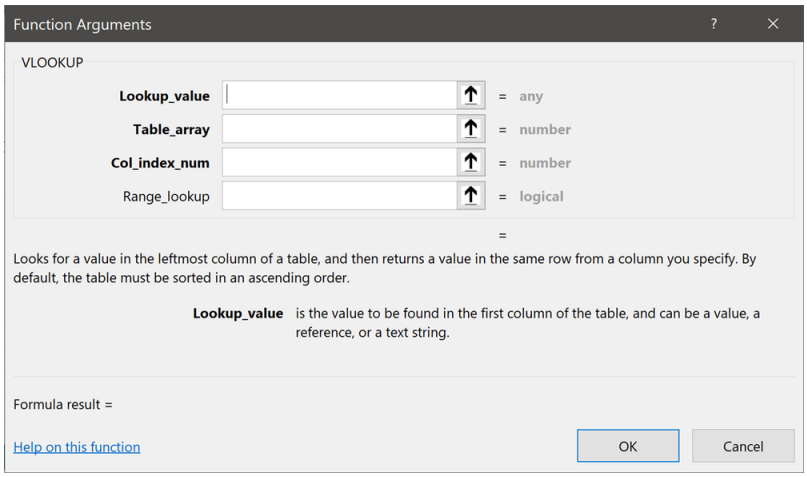
2. In the **Insert Function** dialog box:
   A. Search on "VLOOKUP" or, in the **Or select a category** drop-down box, select **Lookup & Reference**.
   B. Under **Select a function**, select **VLOOKUP**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. Enter the **Lookup_value** or the cell in which it is located.
   B. Enter the **Table_array**.
   C. Enter the **Col_index_num**.

D. Enter the **Range_lookup**. If you leave this blank, Excel will treat this as if you entered *True*.

E. Click **OK**.



EVALUATION COPY: Not to be used in class.

Exercise 5: Using the VLOOKUP Function

15 to 25 minutes

In this exercise, you will use the `VLOOKUP` function to create an invoice on which the description and price of items will autofill when the item number is entered.

1. Open `VLOOKUP.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**Invoice**".
2. Use the `VLOOKUP` function to query the Description and Price from the table located in the sheet named "**Table**". You will need to insert the `VLOOKUP` function into cells **B7:B15** and **D7:D15**.
   A. Hint: Including absolute references when referring to the range will enable the formulas to be copied to other cells within the column.
3. What is Item Number 135798 and what does it cost?
4. What is Item Number 678452 and what does it cost?

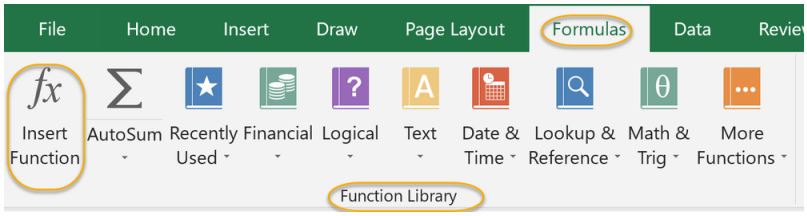
Evaluation Copy

Solution

1. To query the Description from the table located in the sheet named "**Table**":

   A. In the sheet named "**Invoice**", select cell **B7**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

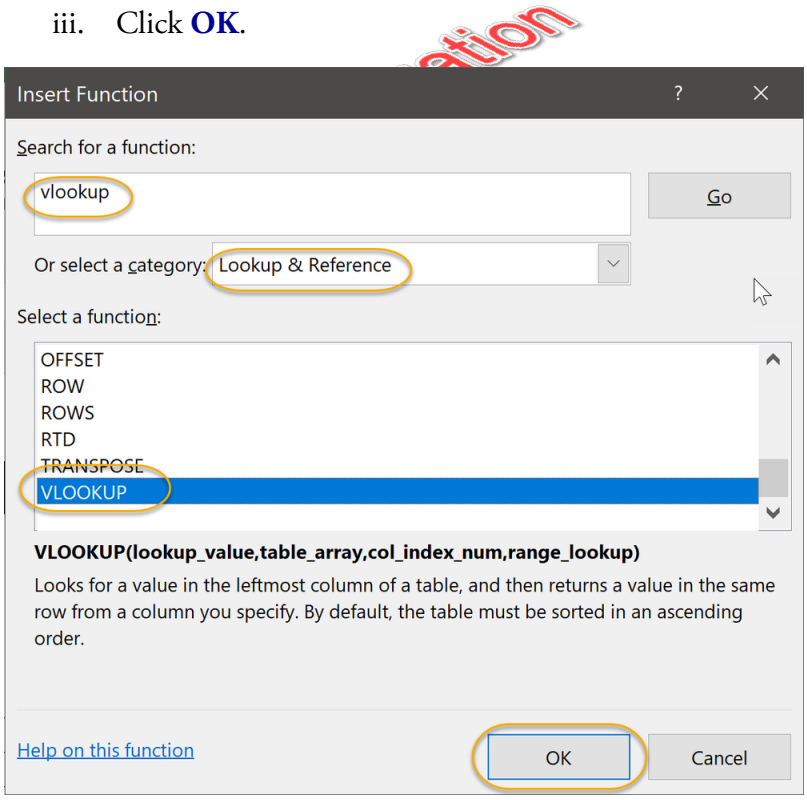


   C. In the **Insert Function** dialog box:

      i. Search on "VLOOKUP" or, in the **Or select a category** drop-down box, select **Lookup & Reference**.

      ii. Under **Select a function**, select **VLOOKUP**.

      iii. Click **OK**.



   D. In the **Function Arguments** dialog box:

EVALUATION COPY: Not to be used in class.

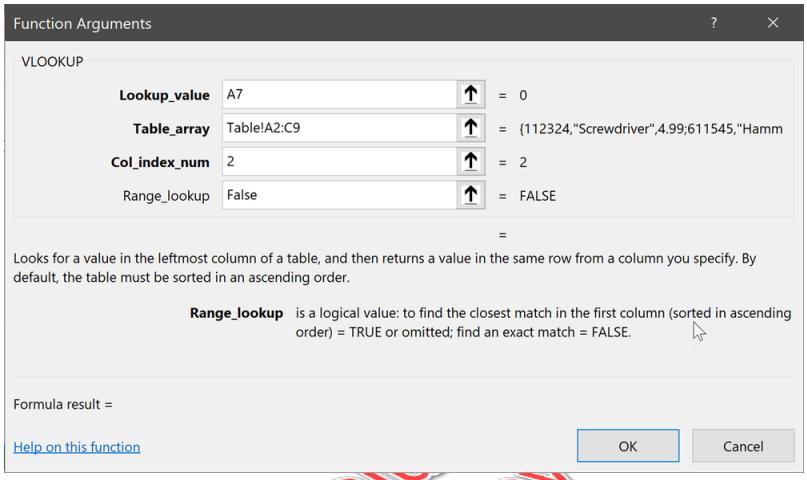
i. Enter the **Lookup_value**: **A7**.

ii. Enter the **Table_array**: **Table!A2:C9** (click the cell selection arrow, then the sheet named "**Table**", and then select the cells).

iii. Enter the **Col_index_num**: **2** (because the description is in the second column in the table).

iv. Enter the **Range_lookup**: **False** (because you require an exact match).

v. Click **OK**.



Eval Copy

2. To query the Price from the table located in the sheet named "**Table**":

A. In the sheet named "**Invoice**", select cell **D7**.

B. On the **FORMULAS** tab, in the **Function Library** group, click the **Insert Function** command.

C. In the **Insert Function** dialog box:

i. Search on "VLOOKUP" or, in the **Or select a category** drop-down box, select **Lookup & Reference**.

ii. Under **Select a function**, select **VLOOKUP**.

iii. Click **OK**.

D. In the **Function Arguments** dialog box:

i. Enter the **Lookup_value**: **A7**.

ii. Enter the **Table_array**: **Table!A2:C9** (click the cell selection arrow, then the sheet named "**Table**", and then select the cells).

iii. Enter the **Col_index_num**: **3** (because the description is in the third column in the table).

iv. Enter the **Range_lookup**: **False** (because you require an exact match).

v. Click **OK**.

3. Select cell **B7** and edit the formula to make the table references absolute (change **A2:C9** to **$A$2:$C$9**). Then do the same in cell **D7**.
4. Copy cell **B7** to cells **B8:B15** and cell **D7** to **D8:D15**.
5. Enter "135798" into any cell under "Item Number" on the invoice. Item Number 135798 is a rake and costs $12.98.
6. Enter "678452" into any cell under "Item Number" on the invoice. Item Number 678452 is a wrench and costs $6.99.

1.7. Using the HLOOKUP Function

The `HLOOKUP` function is very similar to the `VLOOKUP` function. The only significant difference is that while the `VLOOKUP` function looks for a value in the *left-most column* of a table and returns a value on the same *row* as that value, the `HLOOKUP` function looks for a value in the *top row* of a table and returns a value in the same *column* as that value. To use the `HLOOKUP` function, you need to know:

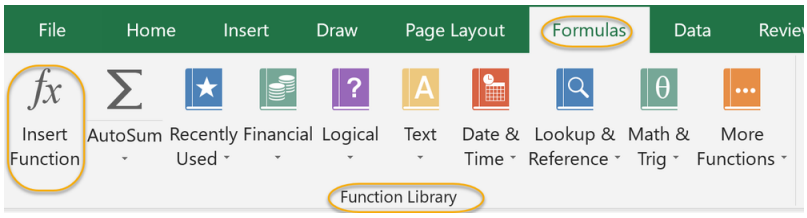
Evaluation Copy

1. **Lookup value**. The value you will use to identify individual records in your table. The *Lookup Value* must be in the top row of your table.
2. **Table array**. The table that contains the data you will use `HLOOKUP` to retrieve. This table can be in another worksheet or even another workbook from the one in which you enter the `HLOOKUP` function.
3. **Row index num**. The *Lookup Value* is always in the top row of the *Table Array* (row #1, regardless of where in the worksheet the table is located). The next row down is row #2, then row #3, etc. The *Row index num* is simply the number of the row that contains the value you wish to retrieve.
4. **Range lookup**. Enter *False* if the *Lookup Value* must match exactly. If you enter *True* or leave blank, Excel will assume the table is sorted in ascending order and will select the best match. Note that if the table is not sorted in ascending order, Excel likely won't correctly find the best match.

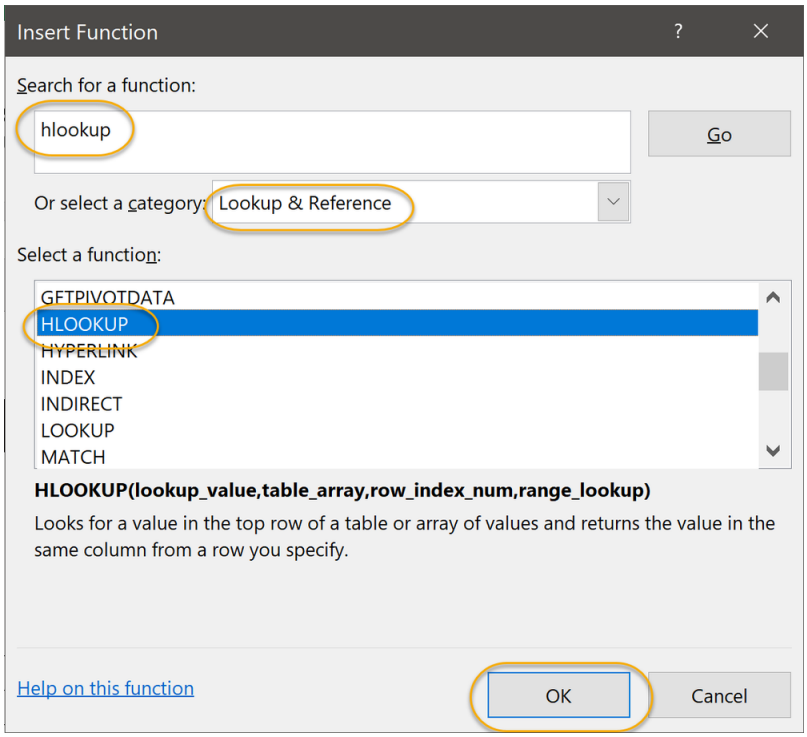
To use the `HLOOKUP` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

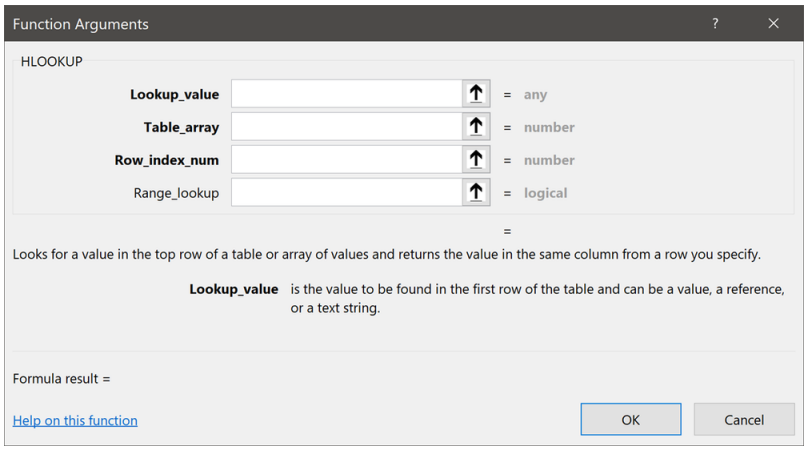
EVALUATION COPY: Not to be used in class.



2. In the **Insert Function** dialog box:
   A. Search on "HLOOKUP" or, in the **Or select a category** drop-down box, select **Lookup & Reference**.
   B. Under **Select a function**, select **HLOOKUP**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. Enter the **Lookup_value** or the cell in which it is located.
   B. Enter the **Table_array**.
   C. Enter the **Row_index_num**.
   D. Enter the **Range_lookup**. If you leave this blank, Excel will treat this as if you entered *True*.
   E. Click **OK**.



1.8. Using the CONCAT Function

The `CONCAT` function (called CONCATENATE in versions of Excel previous to 2019) is used to join the contents of multiple cells. For example, if you have a worksheet with first names in one column and last names in another column, you can use the `CONCAT` function to join the first and last names into one column. This function supports cell references, as well as range references.

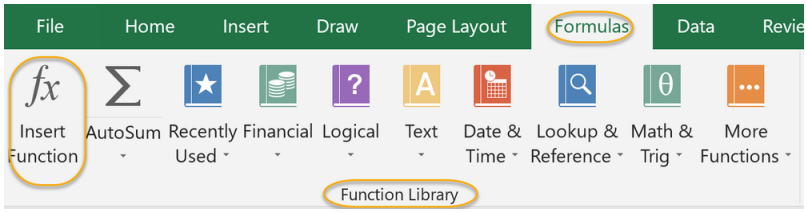
Evaluation Copy

Here are some things to know about the `CONCAT` function:

1. You can join up to 255 text strings.
2. The text string can include text, numbers, and cell references.
3. You can include text not found in the worksheet by adding it via the **Function Arguments** dialog box (or directly into the formula). For example, if you have a worksheet with city names in one column and state names in another column, and wish to join them into one column, you can add a comma and space (“, ”) between the two.

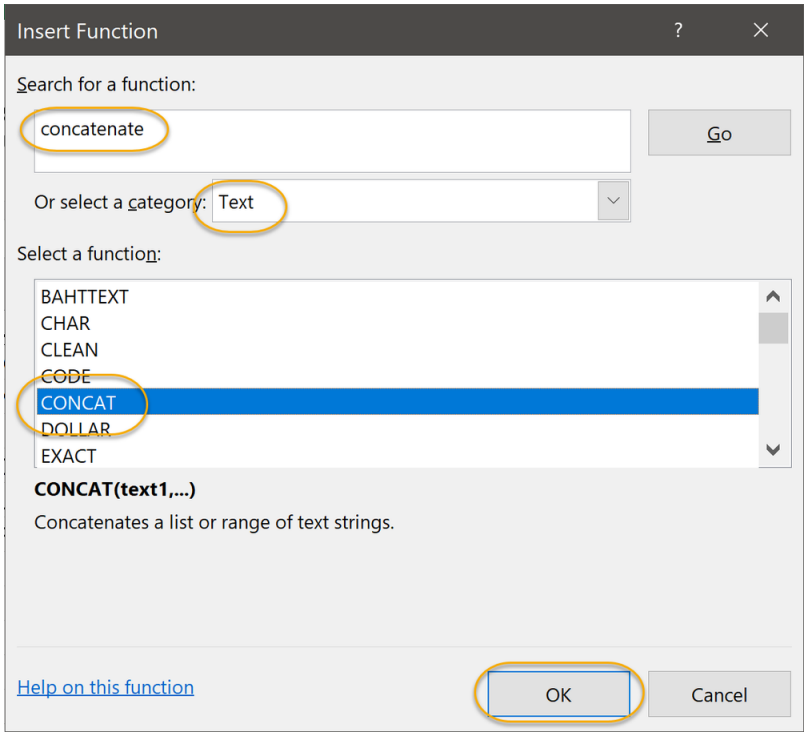
To use the `CONCAT` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

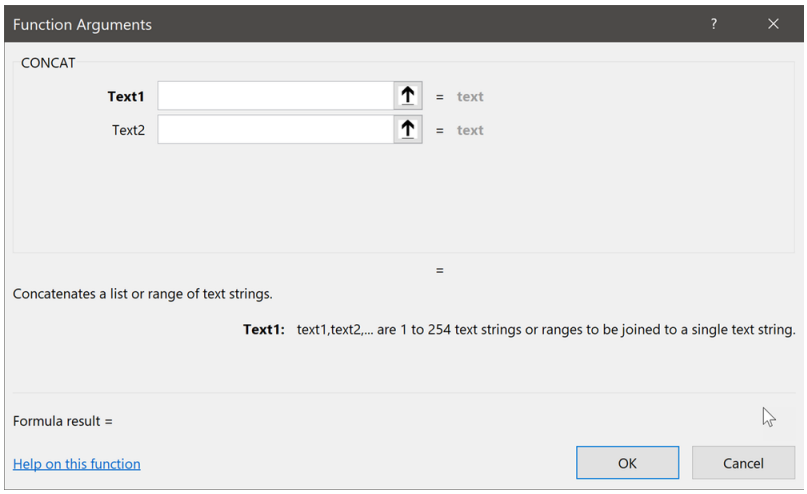


EVALUATION COPY: Not to be used in class.

2. In the **Insert Function** dialog box:
   A. Search on "CONCAT" or, in the **Or select a category** drop-down box, select **Text**.
   B. Under **Select a function**, select **CONCAT**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. In the **Text1** data entry field, enter the first text field or the cell in which it is located.
   B. In the **Text2** data entry field, enter the first text field or the cell in which it is located.
   C. Etc. (New fields appear when you use the bottom field.)
   D. Click **OK**.



EVALUATION COPY: Not to be used in class.

Exercise 6: Using the CONCAT Function

10 to 15 minutes

In this exercise, you will practice using the `CONCAT` function.

Evaluation Copy

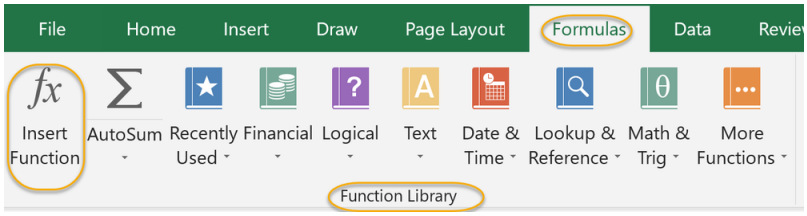
1. Open `Functions.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**CONCATENATE**".
2. Use the `CONCAT` function to join the first and last names into full names in column **C**.
3. Use the `CONCAT` function to join the cities and states so that they appear as “city, state”.

Solution

1. To join the first and last names into full names:

   A. In the sheet named "**CONCAT**", select cell **C2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

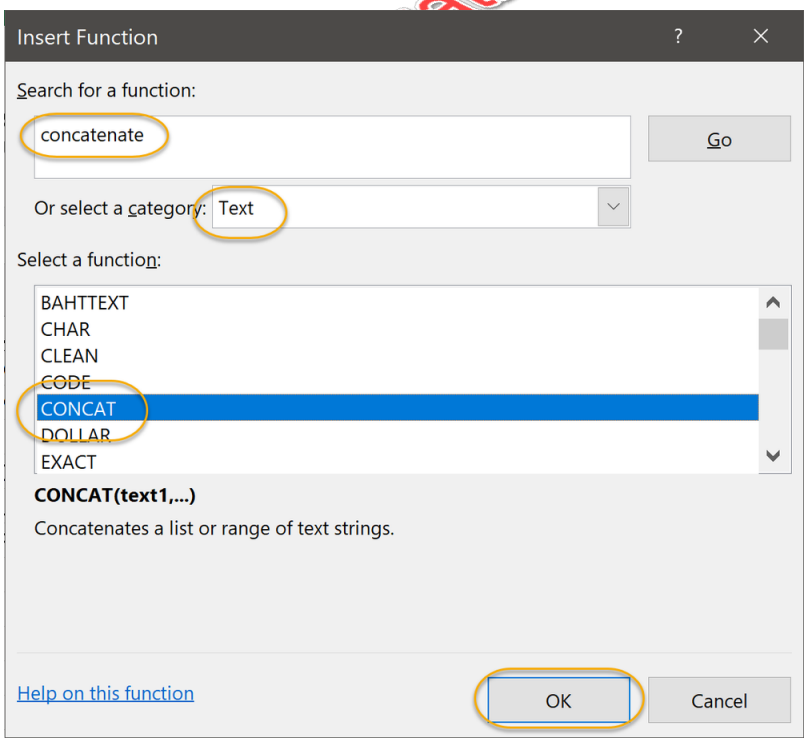


   C. In the **Insert Function** dialog box:

      i. Search on "CONCAT" or, in the **Or select a category** drop-down box, select **Text**.

      ii. Under **Select a function**, select **CONCAT**.

      iii. Click **OK**.



   D. In the **Function Arguments** dialog box:

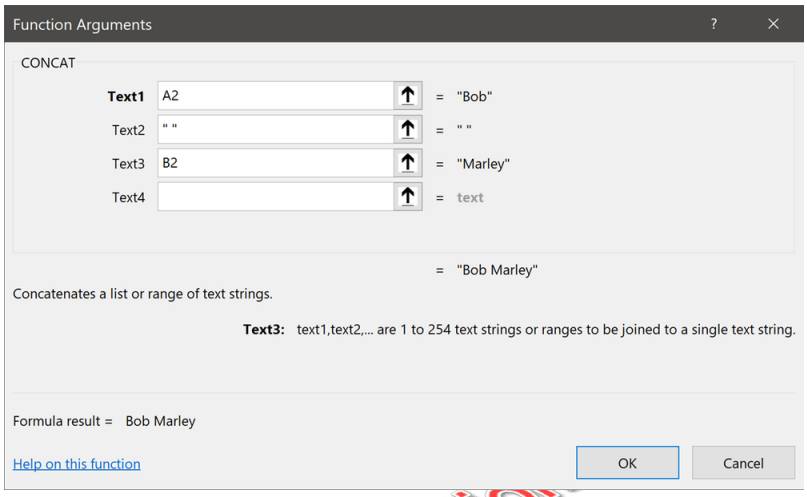
EVALUATION COPY: Not to be used in class.

i. In the **Text1** data entry field, enter cell **A2**.

ii. In the **Text2** data entry field, enter a space (**“ ”**).

iii. In the **Text3** data entry field, enter cell **B2**.

iv. Click **OK**.



E. Copy cell **C2** to cells **C3:C7**.

Evaluation Copy

2. To join the cities and states so that they appear as “city, state”:

A. In the sheet named "**CONCAT**", select cell **G2**.

B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

C. In the **Insert Function** dialog box:

i. Search on “CONCAT” or, in the **Or select a category** drop-down box, select **Text**.

ii. Under **Select a function**, select **CONCAT**.

iii. Click **OK**.

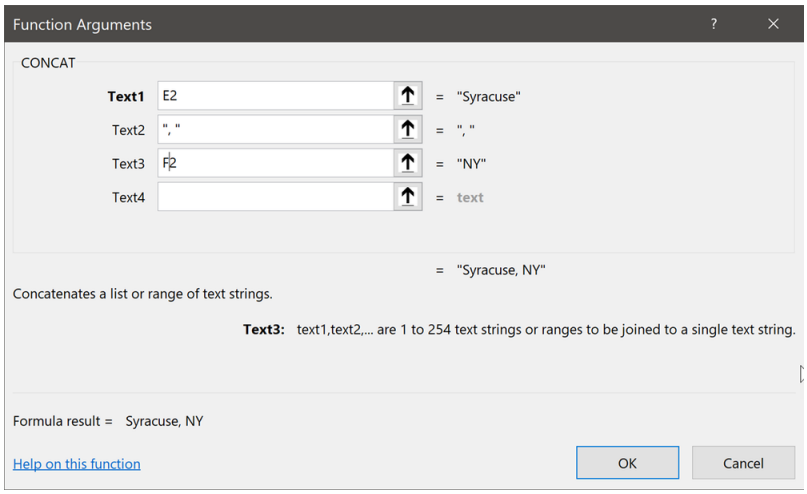
D. In the **Function Arguments** dialog box:

i. In the **Text1** data entry field, enter cell **E2**.

ii. In the **Text2** data entry field, enter a comma and a space (**“, ”**).

iii. In the **Text3** data entry field, enter cell **F2**.

iv. Click **OK**.



E. Copy cell **G2** to cells **G3:G7**.

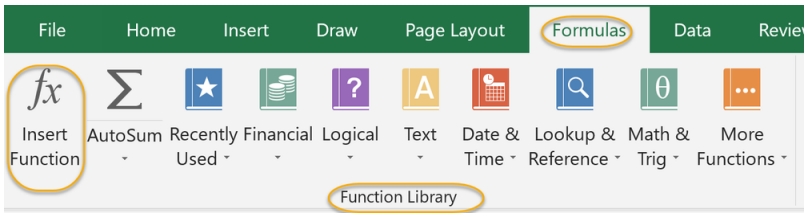
1.9. Using the TRANSPOSE Function

Evaluation Copy

You can use the `TRANSPOSE` function to return a horizontal range of cells as a vertical range or a vertical range as a horizontal range.

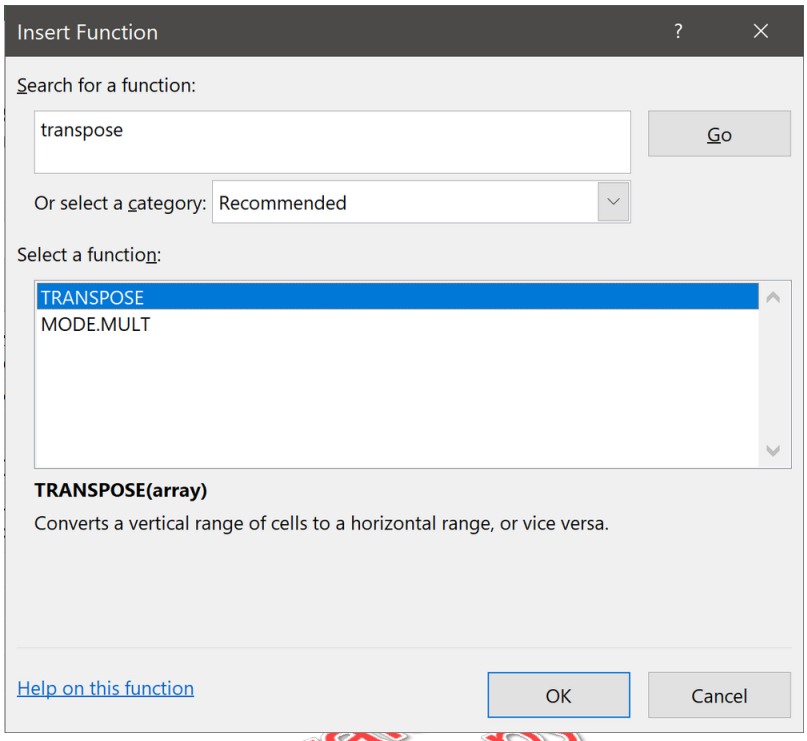
To use `TRANSPOSE`, you must know the array, the range of cells you want to transpose. To use the `TRANSPOSE` function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



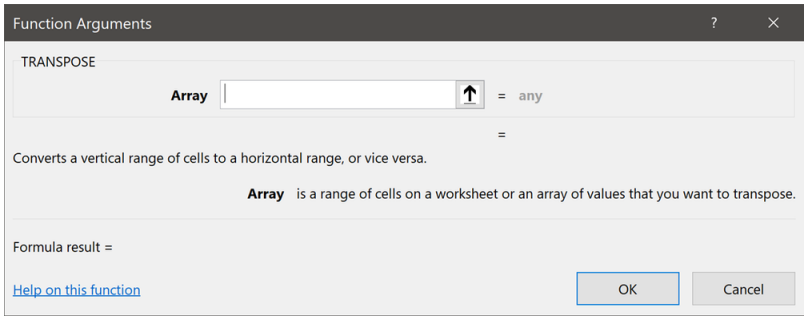
2. In the **Insert Function** dialog box:
   A. Search on "TRANSPOSE" or, in the **Or select a category** drop-down box, select **Recommended**.
   B. Under **Select a function**, select **TRANSPOSE**.
   C. Click **OK**.

EVALUATION COPY: Not to be used in class.



Eval Copy

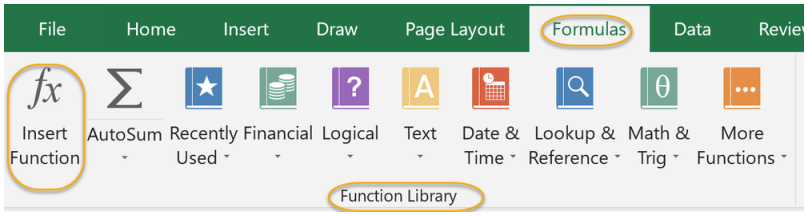
3. In the **Function Arguments** dialog box:
   A. In the **Array** data entry field, enter the range of cells or an array of values you want to transpose.
   B. Click **OK**.



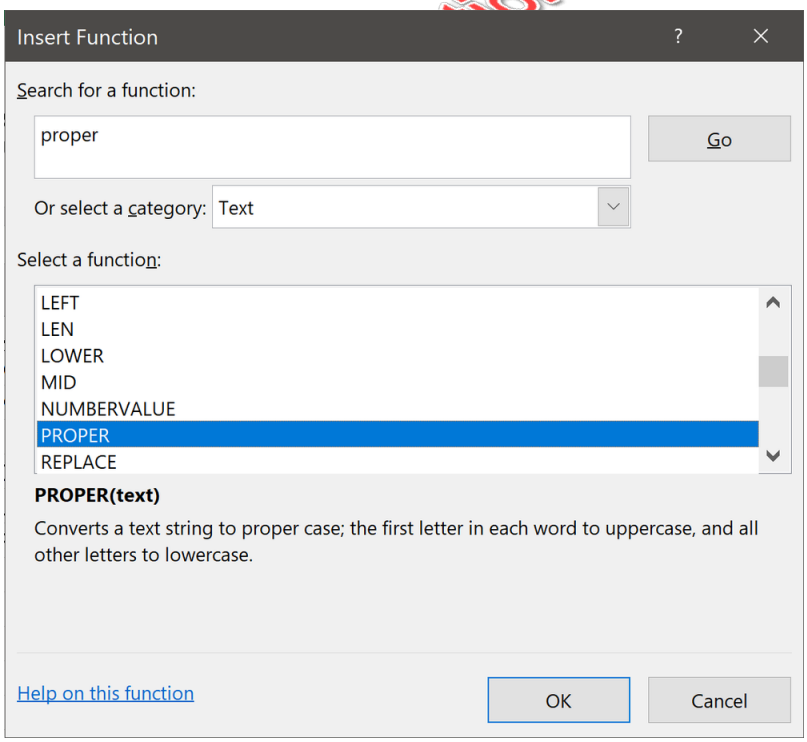
1.10. Using the PROPER, UPPER, and LOWER Functions

The PROPER function is used to make the first letter in each word uppercase and all other letters lowercase. To use the PROPER function:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



2. In the **Insert Function** dialog box:
   A. Search on "PROPER" or, in the **Or select a category** drop-down box, select **Text**.
   B. Under **Select a function**, select **PROPER**.
   C. Click **OK**.

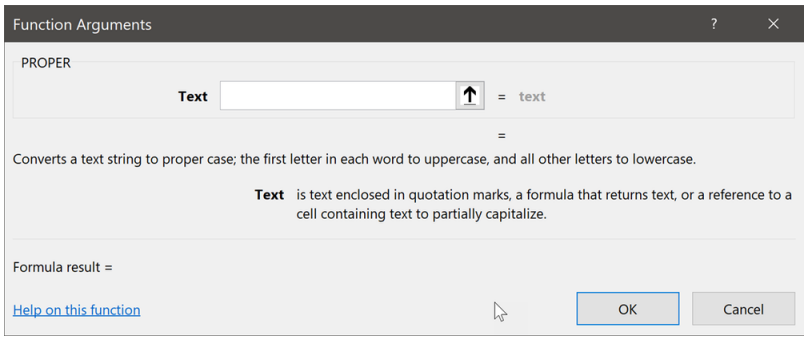


3. In the **Function Arguments** dialog box:

EVALUATION COPY: Not to be used in class.

A. In the **Text** data entry field, enter the cell containing the text you wish to capitalize the first letters of.

B. Click **OK**.

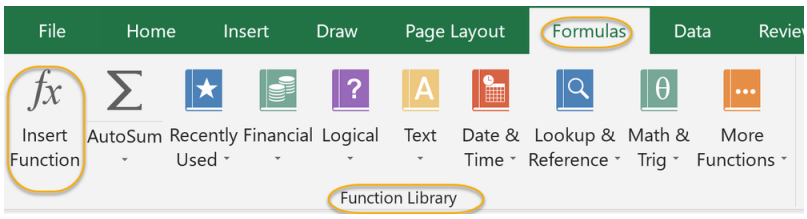


❖ 1.10.1. The UPPER Function

Evaluation Copy

The UPPER function is used to make all letters in words uppercase.

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

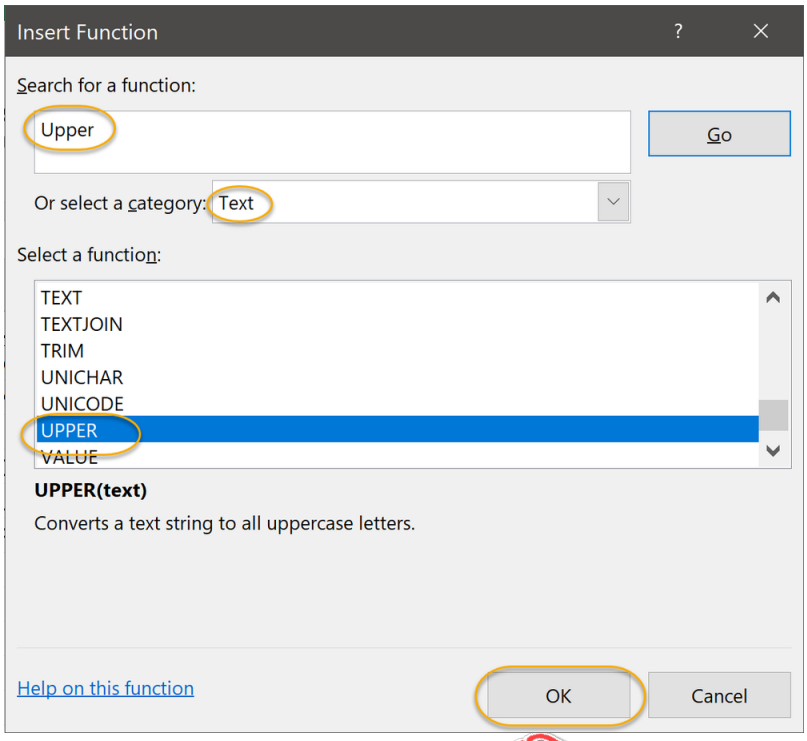


2. In the **Insert Function** dialog box:

   A. Search on "UPPER" or, in the **Or select a category** drop-down box, select **Text**.

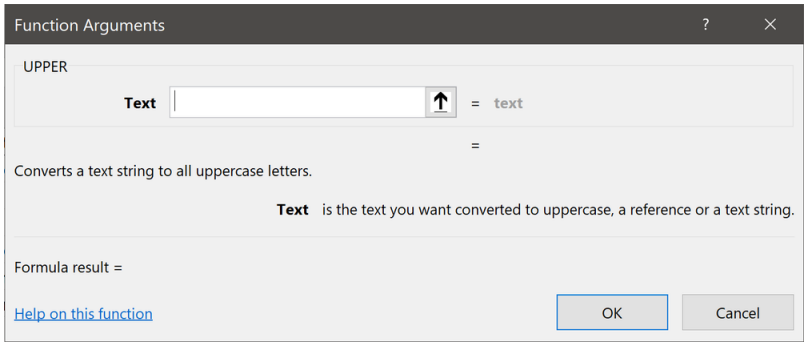
   B. Under **Select a function**, select **UPPER**.

   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. In the **Text** data entry field, enter the cell containing the text you wish to make all uppercase.
   B. Click **OK**.

Evaluation Copy

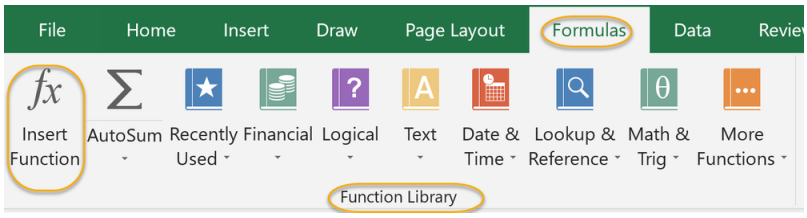


❖ 1.10.2. The LOWER function

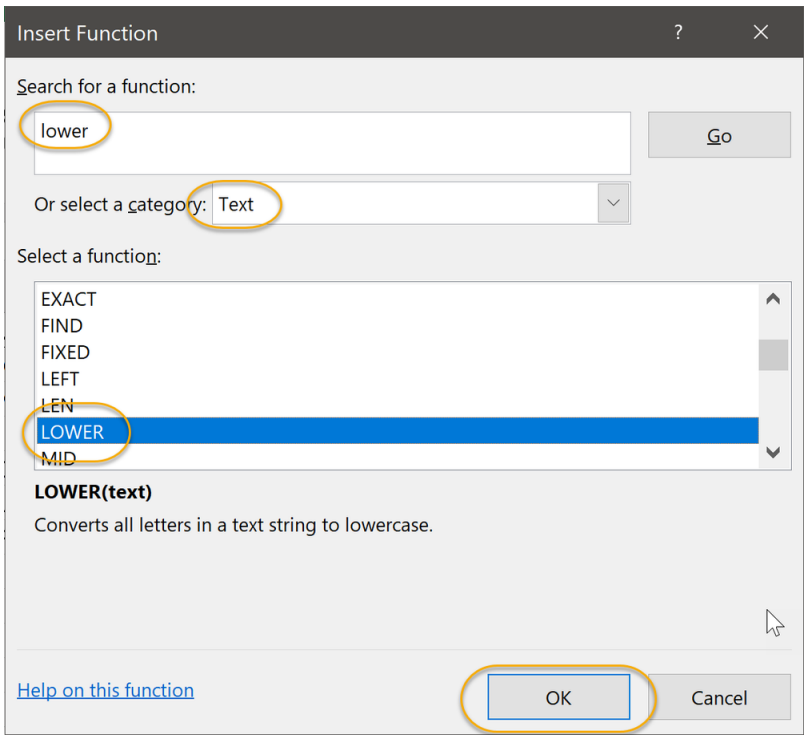
The `LOWER` function is used to make all letters in words lowercase.

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

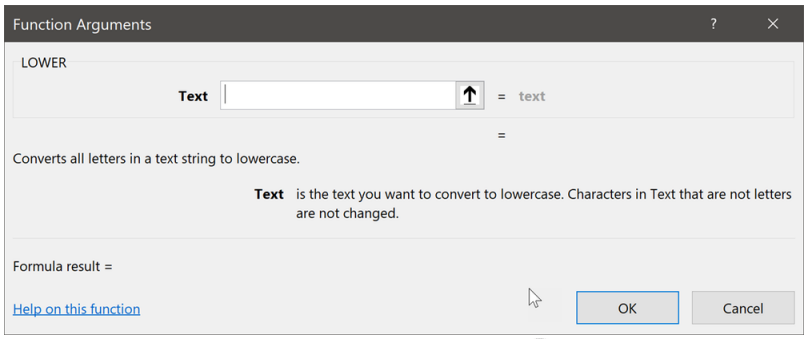
EVALUATION COPY: Not to be used in class.



2. In the **Insert Function** dialog box:
   A. Search on "LOWER" or, in the **Or select a category** drop-down box, select **Text**.
   B. Under **Select a function**, select **LOWER**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. In the **Text** data entry field, enter the cell containing the text you wish to make all lowercase.
   B. Click **OK**.



Evaluation Copy

❖ 1.10.3. The TRIM Function

Another text function you may use is the `TRIM` function, which is helpful for cleaning up data. `TRIM` allows you to remove extra spaces, leaving only single spaces between words.

❖ 1.10.4. The LEN Function

Another text function that may be useful is the LEN function. `LEN` allows you to determine a text string's length.

EVALUATION COPY: Not to be used in class.

Exercise 7: Using the PROPER Function

5 to 10 minutes

In this exercise, you will practice using the `PROPER` function.

Evaluation Copy

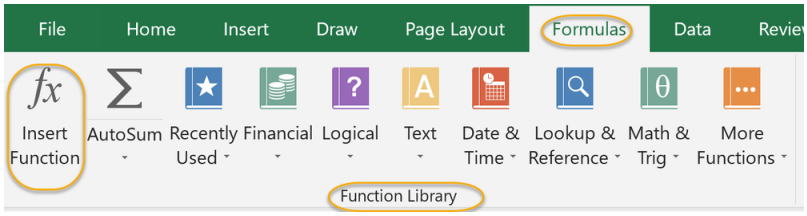
1. Open `Functions.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**PROPER**".
2. In column **B**, use the `PROPER` function to capitalize the first letters of the names in column **A**.

Solution

1. To capitalize the first letters of the names in column **A**:

   A. In the sheet named "**PROPER**", select cell **B2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

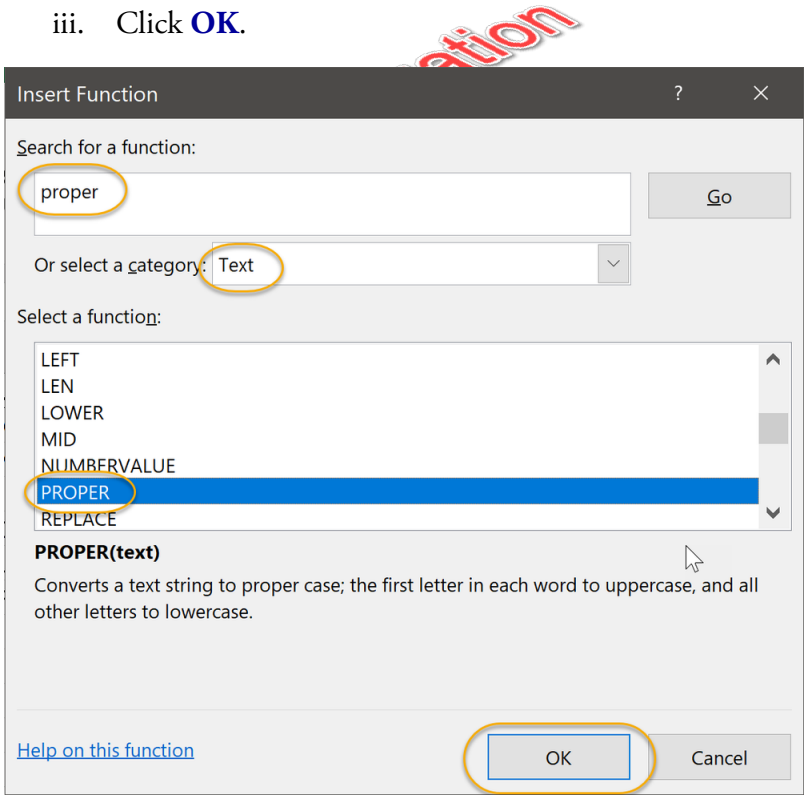


   C. In the **Insert Function** dialog box:

      i. Search on "PROPER" or, in the **Or select a category** drop-down box, select **Text**.

      ii. Under **Select a function**, select **PROPER**.

      iii. Click **OK**.

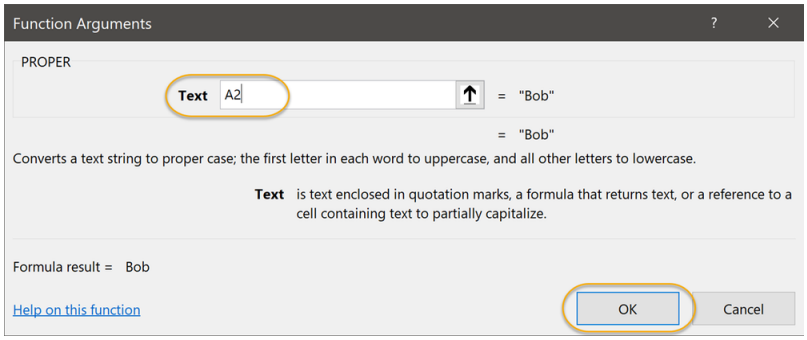


   D. In the **Function Arguments** dialog box:

EVALUATION COPY: Not to be used in class.

i. In the **Text** data entry field, enter **A2**.

ii. Click **OK**.



E. Copy cell **B2** to cells **B3:B7**.

1.11. Using the LEFT, RIGHT, and MID Functions

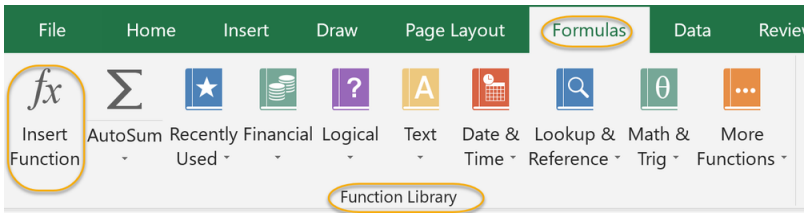
Evaluation Copy

The `LEFT` and `RIGHT` functions are used to return characters from the start or end of a string. For example, you could use the `LEFT` and `RIGHT` functions to:

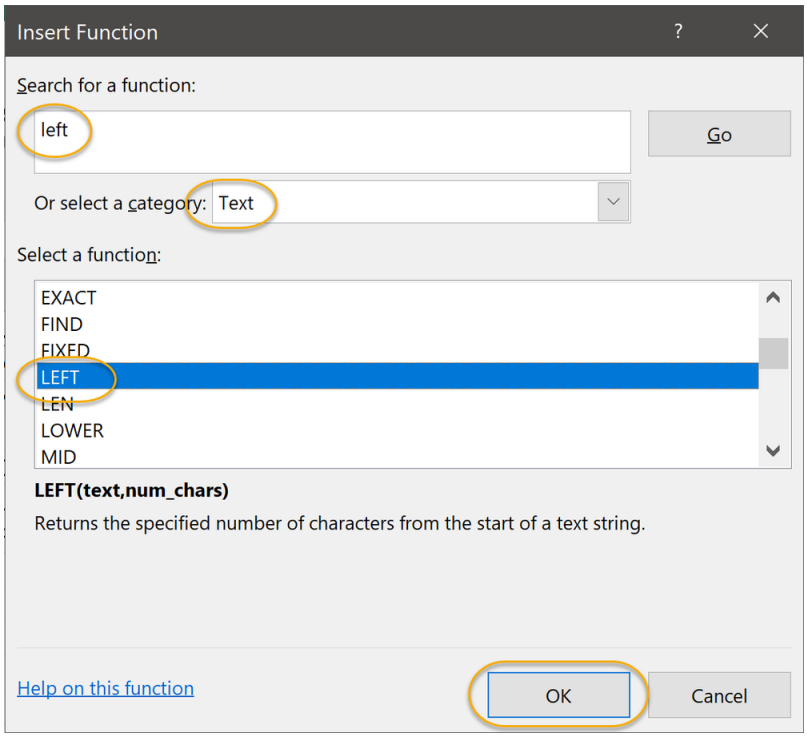
1. Return the area codes from a list of phone numbers (if the phone numbers are formatted as **315-333-4444**, you would use the `LEFT` function to return the first three characters).
2. Return the zip codes from a list of addresses (if the addresses are formatted as **Syracuse, NY 13210**, you would use the `RIGHT` function to return the last five characters).
3. Return a piece of an identifying ID (if you have a list of IDs in which the first four digits represent a product, the next six digits represent the date, and the last three digits represent the store the product was sold from, you could use the `LEFT` function to return the four digits representing the product or the `RIGHT` function to return the three digits representing the store the product was sold from).

To use the `LEFT` and `RIGHT` functions:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

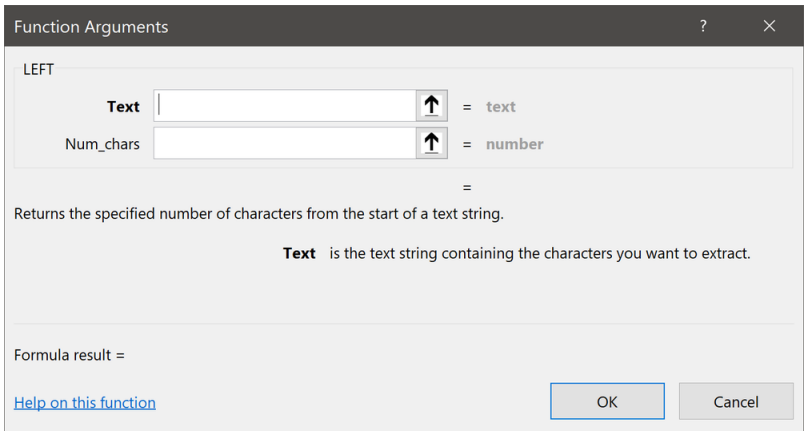


2. In the **Insert Function** dialog box:
   A. Search on "LEFT" or "RIGHT" or, in the **Or select a category** drop-down box, select **Text**.
   B. Under **Select a function**, select **LEFT** or **RIGHT**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. In the **Text** field, enter the cell containing the text string from which you wish to return characters.
   B. In the **Num_Chars** field, enter the number of characters you want to return.
   C. Click **OK**.

EVALUATION COPY: Not to be used in class.



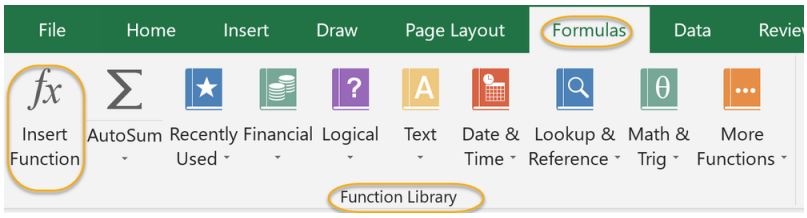
❖ 1.11.1. The MID Function

Evaluation Copy

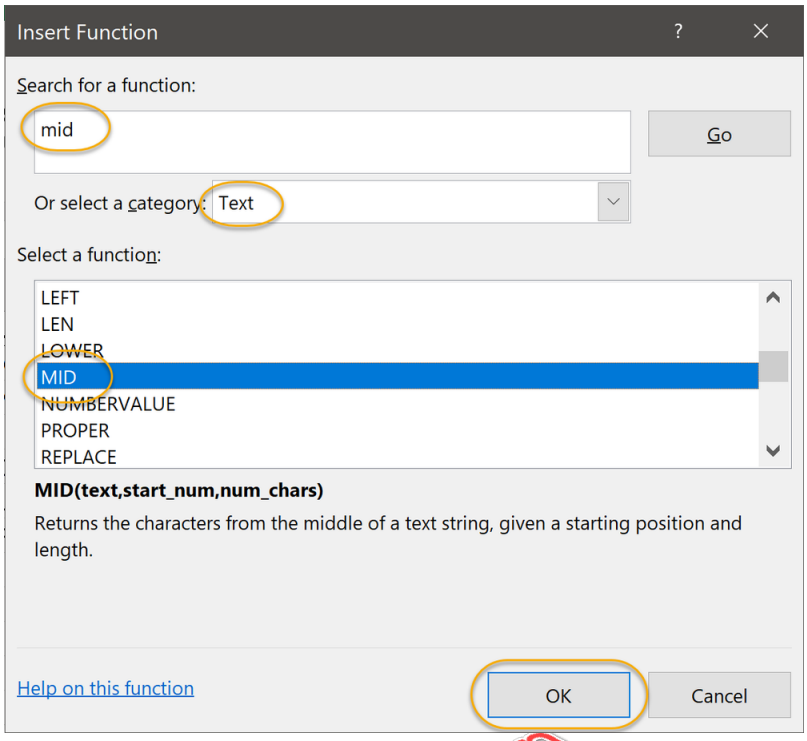
The `MID` function is used when you want to return a specific amount of characters from a string of text. You specify the number of characters.

To use the MID function:

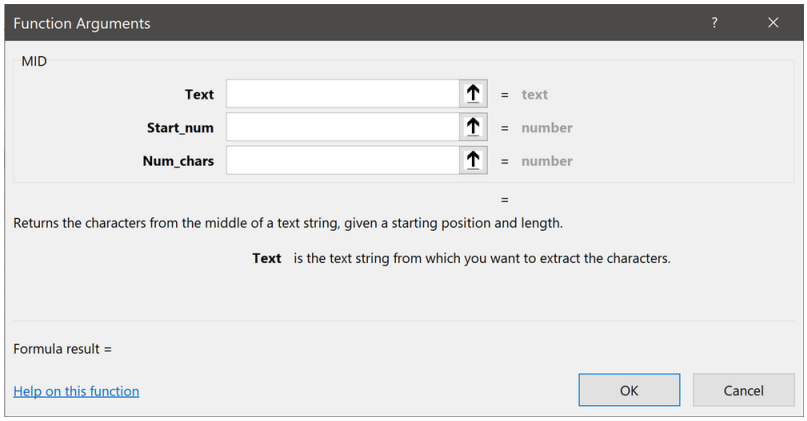
1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



2. In the **Insert Function** dialog box:
   A. Search on "MID" or, in the **Or select a category** drop-down box, select **Text**.
   B. Under **Select a function**, select **MID**.
   C. Click **OK**.



3. In the **Function Arguments** dialog box:
   A. In the **Text** field, enter the cell containing the text string from which you wish to return characters.
   B. In the **Start_num** field, enter the position of the first character that you wish to extract.
   C. In the **Num_Chars** field, enter the number of characters you want to return.
   D. Click **OK**.



Evaluation Copy

EVALUATION COPY: Not to be used in class.

Some additional functions you might find useful are listed below. To view all of the functions, click each button in the Function Library.

1. `DECIMAL`: Available on the **Math & Trig** tab. This function converts the text of a number in a given base into a decimal number.
2. `ACOT`: Available on the **Math & Trig** tab. This function returns the arccotangent of a number.
3. `ENCODEURL`: Available on the **More Functions** tab in the **Web** section. This function returns a URL-encoded string.
4. `DAYS`: Available on the **Date & Time** tab. This function shows the number of days between two dates.
5. `IFS`: Tests conditions in the order you specify.
6. `MINIFS`: Returns the smallest function in a range (which meets the criteria).
7. `MAXIFS`: Returns the largest function in a range (which meets the criteria).
8. `SWITCH`: Used to return the first matching result of the evaluation of an expression against a list of values in order.
9. `TEXTJOIN`: Used to combine text from different ranges; each item is separated by a delimiter.

Evaluation Copy

Exercise 8: Using the LEFT and RIGHT Functions

5 to 15 minutes

In this exercise, you will practice using the `LEFT` and `RIGHT` functions.

Evaluation Copy

1. Open `Functions.xlsx` from your `Excel2019/Exercises` folder and go to the sheet named "**LEFT-RIGHT**".
2. In column **B**, use the `LEFT` function to display only the area codes of the phone numbers listed in column **A**.
3. In columns **E** and **F**, use the `LEFT` and `RIGHT` functions to display the Store IDs and Salesperson IDs for the sales listed in column **D**.

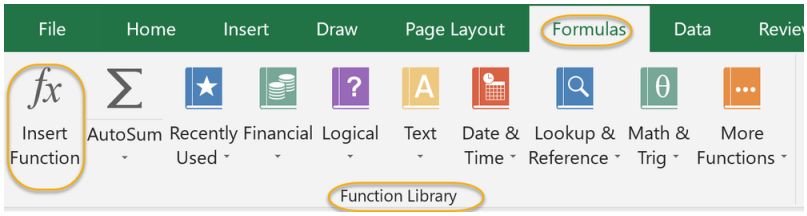
EVALUATION COPY: Not to be used in class.

Solution

1. To display only the area codes of the phone numbers listed in column **A**:

   A. In the sheet named "**LEFT-RIGHT**", select cell **B2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

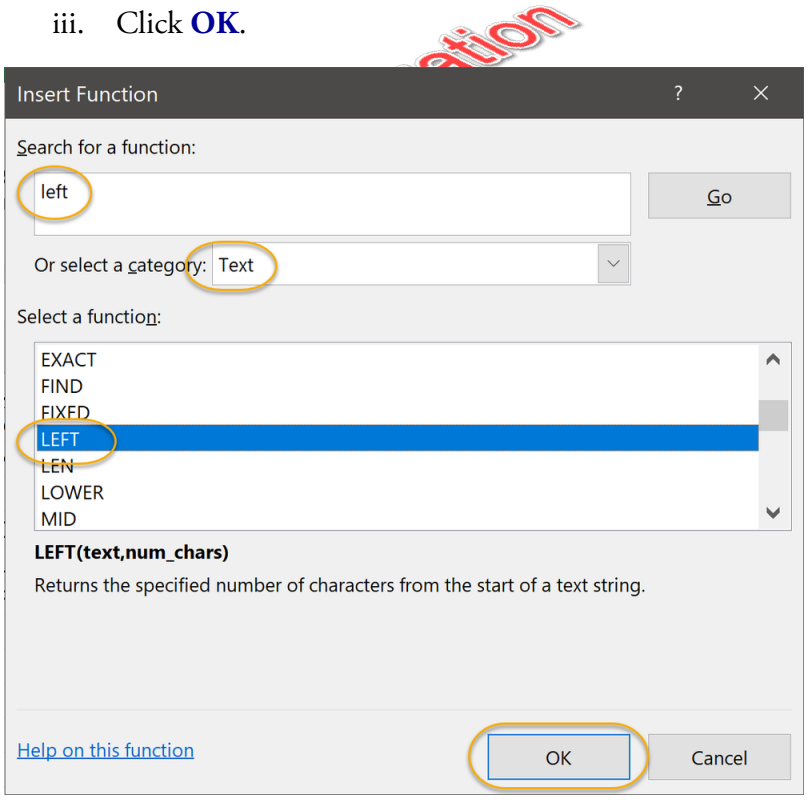


   C. In the **Insert Function** dialog box:

      i. Search on "LEFT" or, in the **Or select a category** drop-down box, select **Text**.

      ii. Under **Select a function**, select **LEFT**.

      iii. Click **OK**.



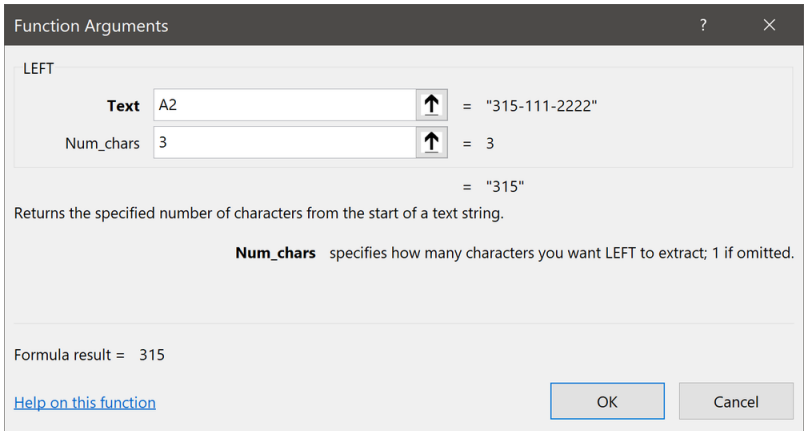
   D. In the **Function Arguments** dialog box:

EVALUATION COPY: Not to be used in class.

i. In the **Text** field, enter cell **A2**.

ii. In the **Num_Chars** field, enter the number "**3**".

iii. Click **OK**.



E. Copy cell **B2** to cells **B3:B7**.

Evaluation Copy

2. To display the Store IDs for the sales listed in column **D**:

A. In the sheet named "**LEFT-RIGHT**", select cell **E2**.

B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

C. In the **Insert Function** dialog box:

i. Search on "LEFT" or, in the **Or select a category** drop-down box, select **Text**.

ii. Under **Select a function**, select **LEFT**.

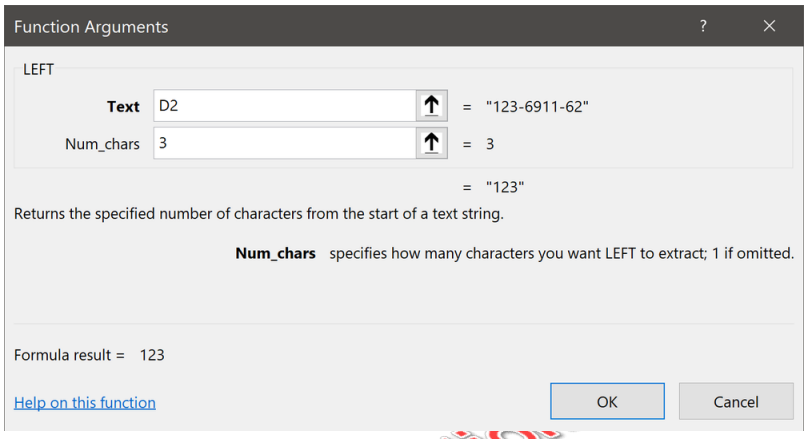
iii. Click **OK**.

D. In the **Function Arguments** dialog box:

i. In the **Text** field, enter cell **D2**.

ii. In the **Num_Chars** field, enter the number "**3**".

iii. Click **OK**.



E. Copy cell **E2** to cells **E3:E7**.

Evaluation Copy

3. To display the Salesperson IDs for the sales listed in column **D**:

   A. In the sheet named "**LEFT-RIGHT**", select cell **F2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command.

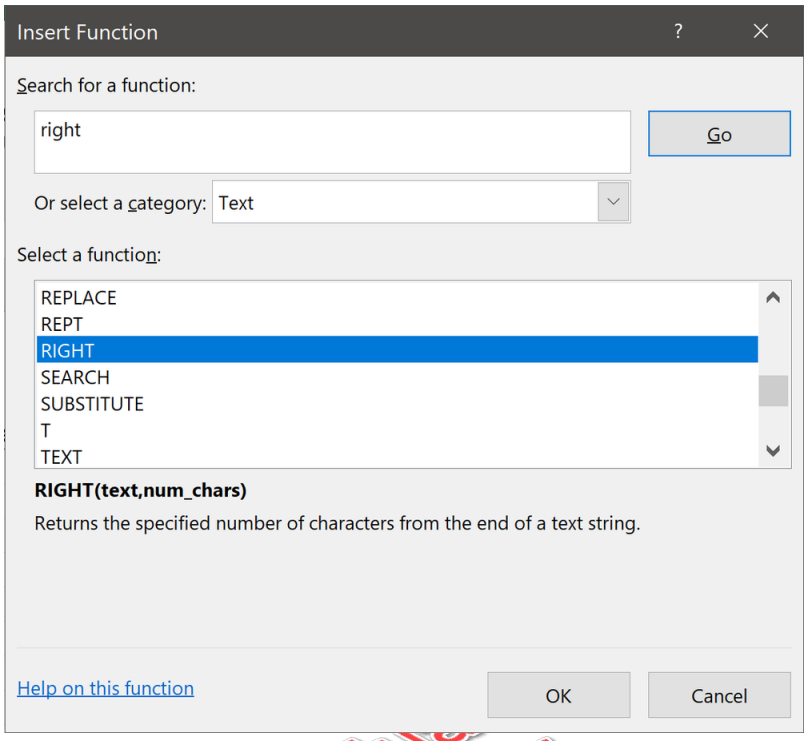
   C. In the **Insert Function** dialog box:

      i. Search on "RIGHT" or, in the **Or select a category** drop-down box, select **Text**.

      ii. Under **Select a function**, select **RIGHT**.

      iii. Click **OK**.

EVALUATION COPY: Not to be used in class.



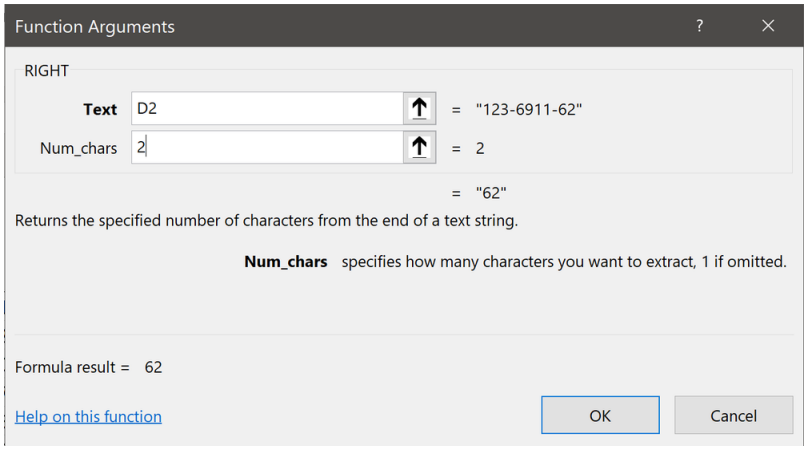
Evaluation Copy

D. In the **Function Arguments** dialog box:

   i. In the **Text** field, enter cell **D2**.

   ii. In the **Num_Chars** field, enter the number "**2**".

   iii. Click **OK**.

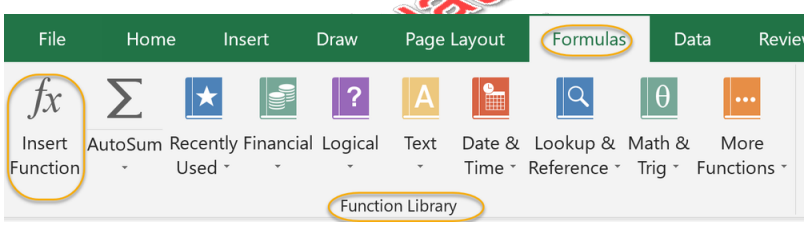


E. Copy cell **F2** to cells **F3:F7**.

1.12. Using Date Functions

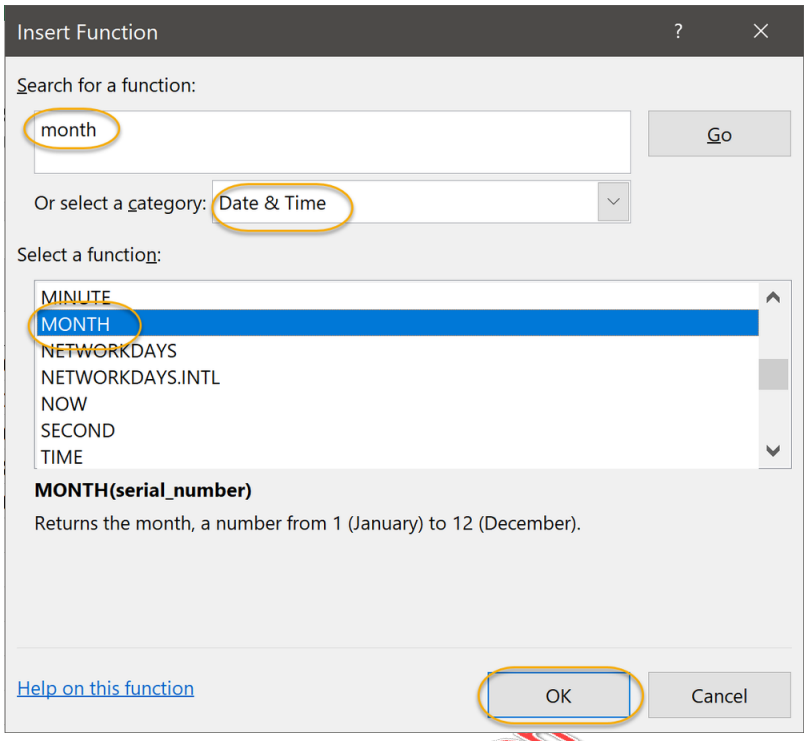
The three most commonly used date functions are `YEAR`, `MONTH`, and `DAY`. These functions are used to return only the year, month, or day from a date. To use the `YEAR`, `MONTH`, and `DAY` functions:

1. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:



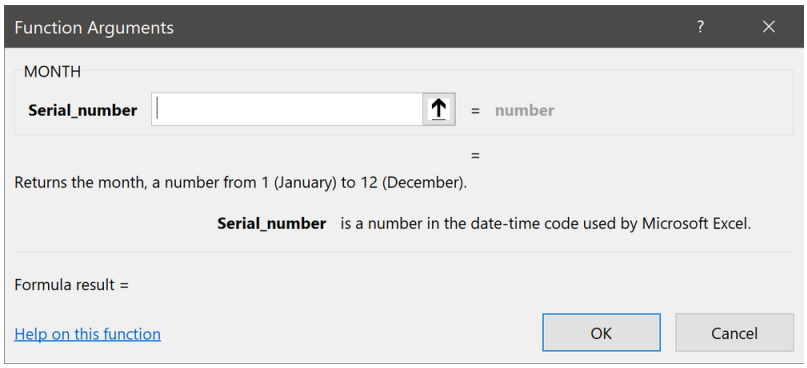
2. In the **Insert Function** dialog box:
   A. Search on "Year", "Month", or "Day" or, in the **Or select a category** drop-down box, select **Date & Time**.
   B. Under **Select a function**, select **YEAR**, **MONTH**, or **DAY**.
   C. Click **OK**.

EVALUATION COPY: Not to be used in class.



Evaluation Copy

3. In the **Function Arguments** dialog box:
   A. In the **Serial_number** field, enter the cell in which the full date is located.
   B. Click **OK**.



❖ 1.12.1. Using the NOW and TODAY Functions

Two other date functions are `NOW` and `TODAY`. They are useful when you need to show the current date information or need to calculate something based on that information.

- `NOW`: Returns the current date and time.
- `TODAY`: Returns the current date, but the time is set to 12:00:00 AM.

Evaluation Copy

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Exercise 9: Using the YEAR, MONTH, and DAY Functions

5 to 15 minutes

Evaluation Copy

In this exercise, you will practice using the `YEAR`, `MONTH`, and `DAY` functions.

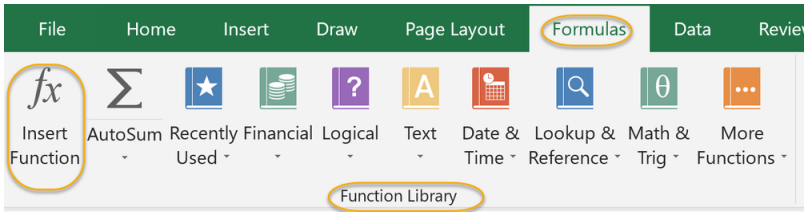
1. Open `Functions.xlsx` from your `Excel2019.2/Exercises` folder and go to the sheet named "**Date**".
2. Use the `YEAR`, `MONTH`, and `DAY` functions to add the years, months, and days of the dates found in column **A** to columns **B**, **C**, and **D**.

Solution

1. To add the year of the dates found in column **A** to column **B**:

   A. In the sheet named "**Date**", select cell **B2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

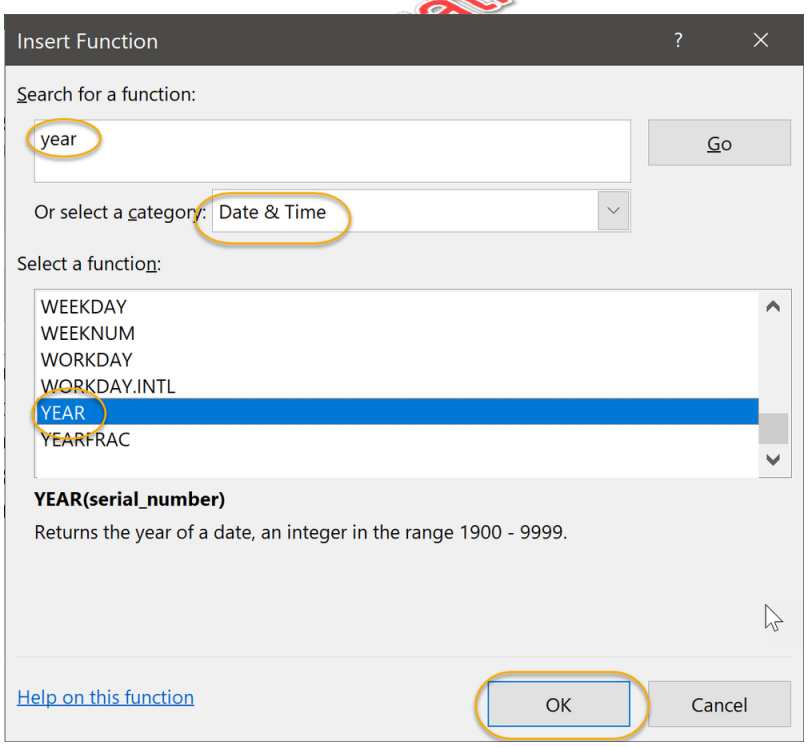


   C. In the **Insert Function** dialog box:

      i. Search on "Year" or, in the **Or select a category** drop-down box, select **Date & Time**.

      ii. Under **Select a function**, select **YEAR**.

      iii. Click **OK**.

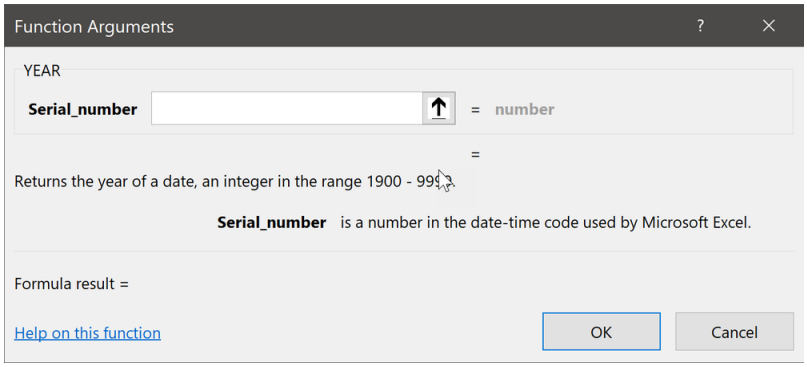


   D. In the **Function Arguments** dialog box:

EVALUATION COPY: Not to be used in class.

i. In the **Serial_number** field, enter cell **A2**.

ii. Click **OK**.



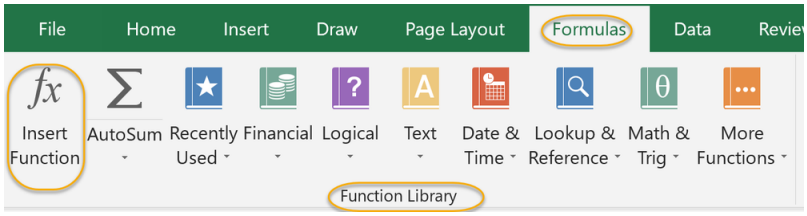
E. Copy cell **B2** to cells **B3:B6**.

2. To add the month of the dates found in column **A** to column **C**:

Evaluation Copy

A. In the sheet named "**Date**", select cell **C2**.

B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

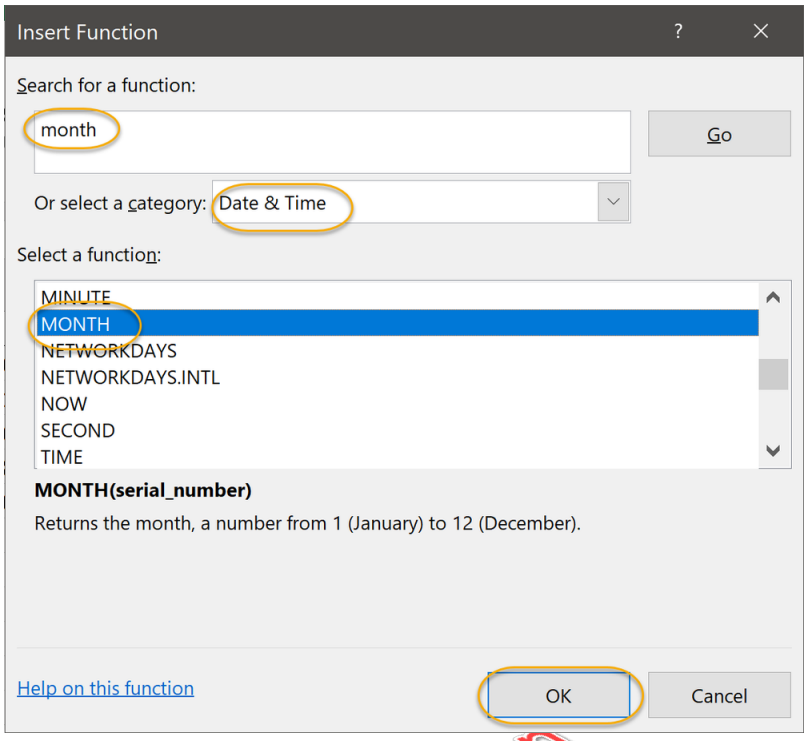


C. In the **Insert Function** dialog box:

i. Search on "Month" or, in the **Or select a category** drop-down box, select **Date & Time**.

ii. Under **Select a function**, select **MONTH**.

iii. Click **OK**.

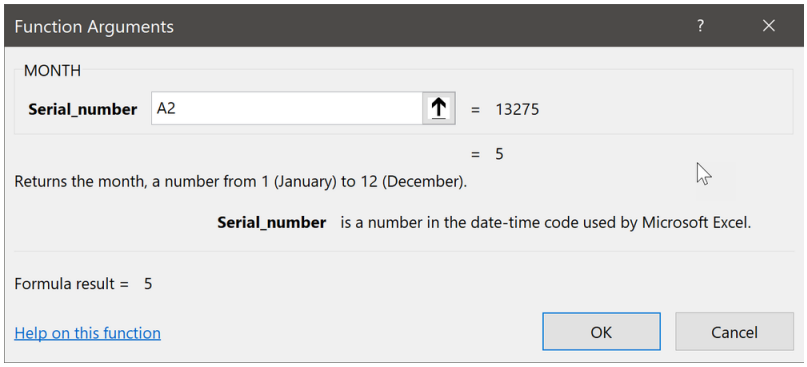


D. In the **Function Arguments** dialog box:

   i. In the **Serial_number** field, enter cell **A2**.

   ii. Click **OK**.

Evaluation Copy



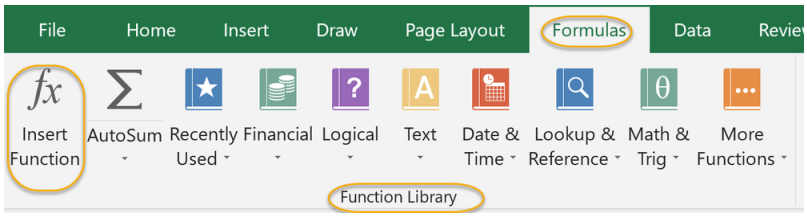
E. Copy cell **C2** to cells **C3:C6**.

3. To add the day of the dates found in column **A** to column **D**:

   A. In the sheet named "**Date**", select cell **D2**.

   B. On the **Formulas** tab, in the **Function Library** group, click the **Insert Function** command:

EVALUATION COPY: Not to be used in class.

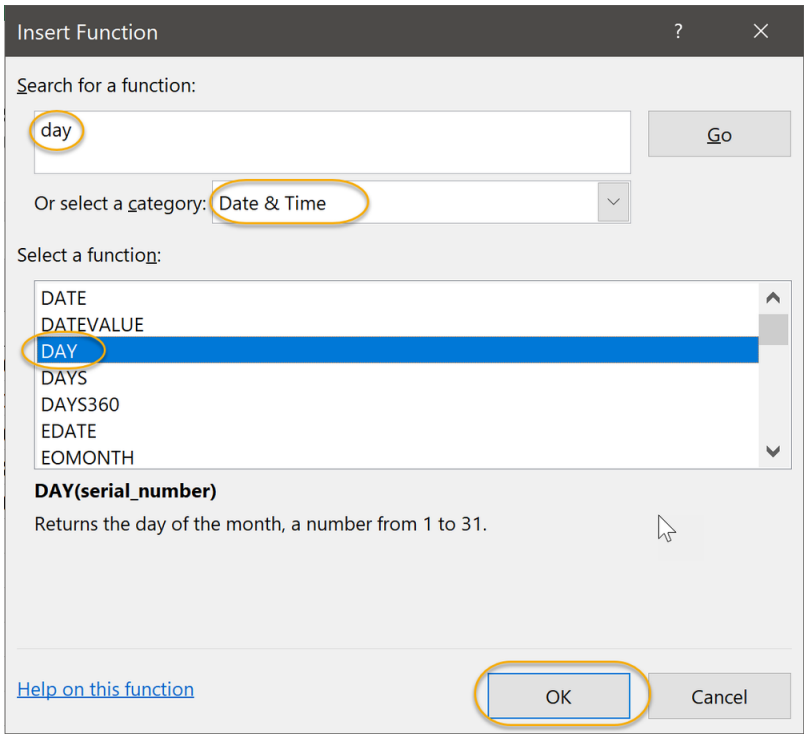


C. In the **Insert Function** dialog box:

   i. Search on "Day" or, in the **Or select a category** drop-down box, select **Date & Time**.

   ii. Under **Select a function**, select **DAY**.

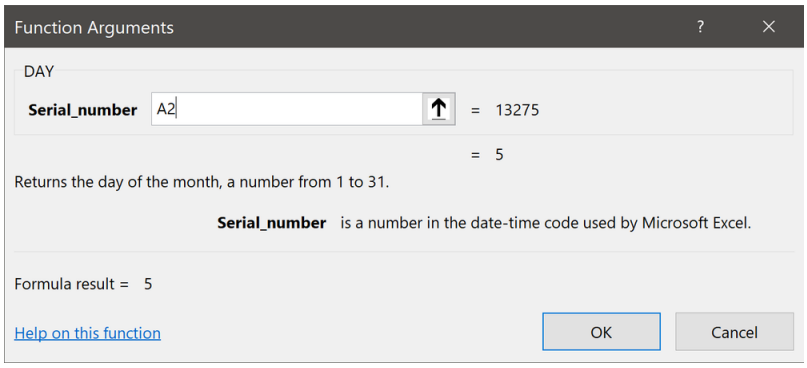
   iii. Click **OK**.



D. In the **Function Arguments** dialog box:

   i. In the **Serial_number** field, enter cell **A2**.

   ii. Click **OK**.



E. Copy cell **D2** to cells **D3:D6**.

1.13. Additional Features

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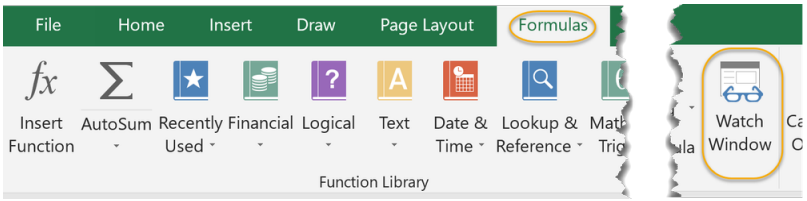
❖ 1.13.1. Utilize the Watch Window

The Watch Window is a feature that allows you to keep formulas that you need to view in sight, rather than having to jump around in a worksheet.

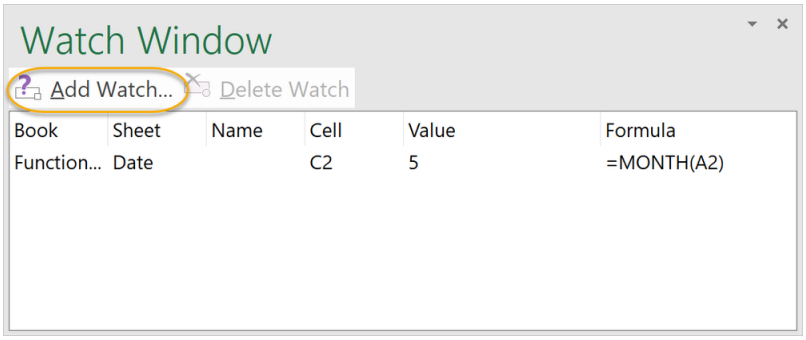
To use the Watch Window:

1. Select the **Formulas** tab, and in the **Formula Auditing** group, select **Watch Window**.

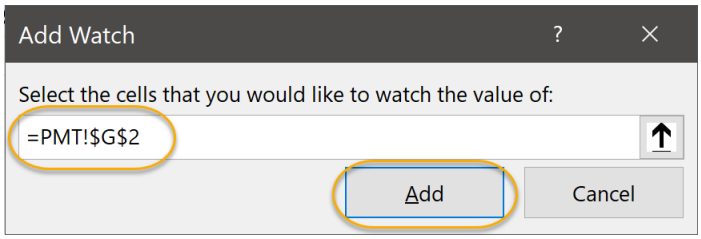


2. In the worksheet, select the cells you want to watch and click **Add Watch** in the Watch Window.

EVALUATION COPY: Not to be used in class.



3. In the **Add Watch** dialog box, click **Add**.



You will now be able to see the value of the selected cell from any worksheet in the workbook simply by clicking on **Watch Window** (or you can leave the Watch Window open).

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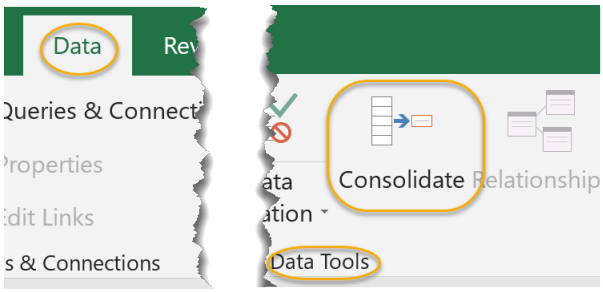
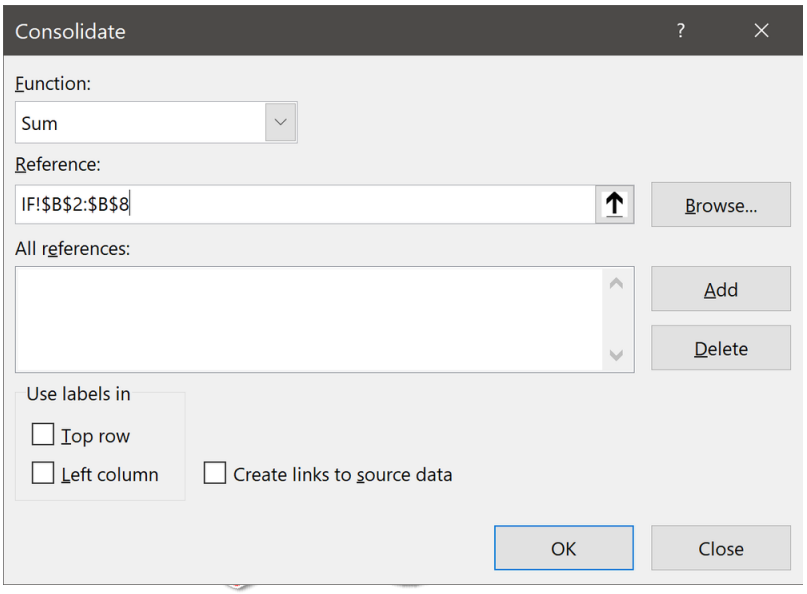
❖ 1.13.2. Consolidate Data

To consolidate data from multiple worksheets (such as quarterly sales data for different sales offices) into one master worksheet:

1. Select the **Data** tab, and from the **Data Tools** tab, select **Consolidate**.



2. While in the **Consolidate** dialog box, click and drag to select cells.
3. Use the **Add** button to continue to add data, and click **OK** when you are done. If different sets of data are ordered differently but have the same labels, check to **Use labels in Top row of Left column** and Excel will calculate the results based on the labels, not the cell locations.



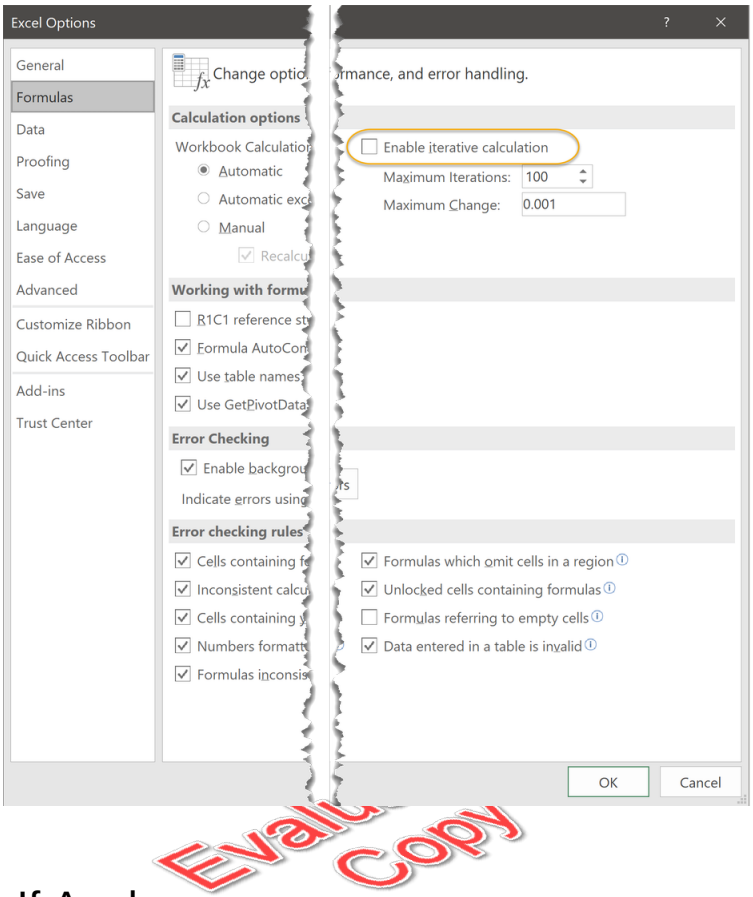
❖ 1.13.3. Enable Iterative Calculations

You can enable iterative calculations to locate circular references.

To enable iterative calculations:

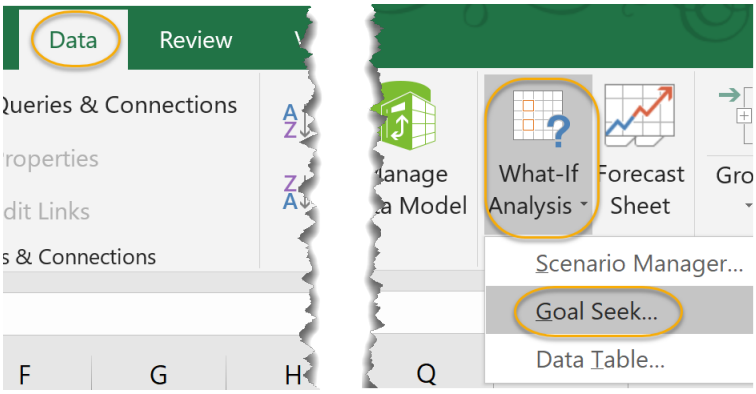
1. From the **File** menu tab, select **Options**.
2. Select the **Formulas** section, and from the **Calculation options** section, check the **Enable iterative calculation** check box.

EVALUATION COPY: Not to be used in class.



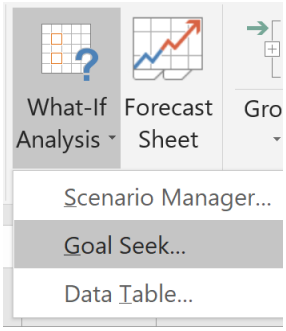
❖ 1.13.4. What-If Analyses

The **Data** tab's **Forecast** group (in Excel 2013, the **Data Tools** group) contains the **What-If Analysis** drop-down list, which contains a number of what-if tools. One of these tools is Goal Seek. Goal Seek enables you to figure out what one value must be to return a specific value in a different cell. For example, if you borrow $1,000 at 10% interest and plan to pay back $100/month, you can use Goal Seek to determine how many months it will take to pay back the loan.

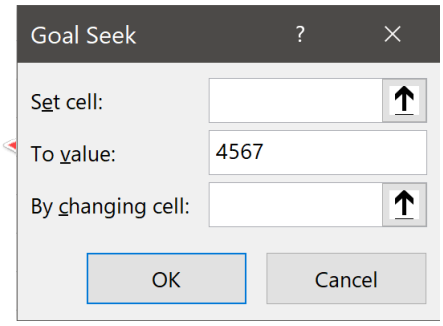


To use Goal Seek:

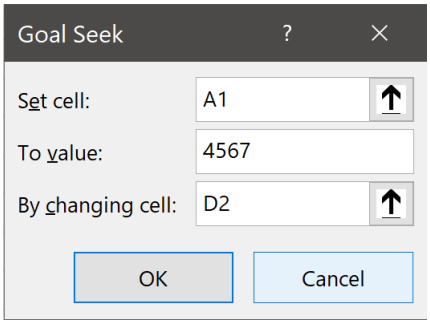
1. Select the cell with the formula you are going to solve for.
2. Select the **Data** tab, and in the **Forecast** group (**Data Tools** group in Excel 2013), select **What-If Analysis**, and then select **Goal Seek**.



3. In the **To value** field, enter the goal.



4. In the **By changing cell** field, enter the cell where you want the result to be and then click **OK**.



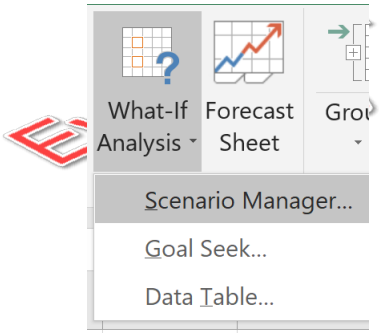
EVALUATION COPY: Not to be used in class.

❖ 1.13.5. Use the Scenario Manager

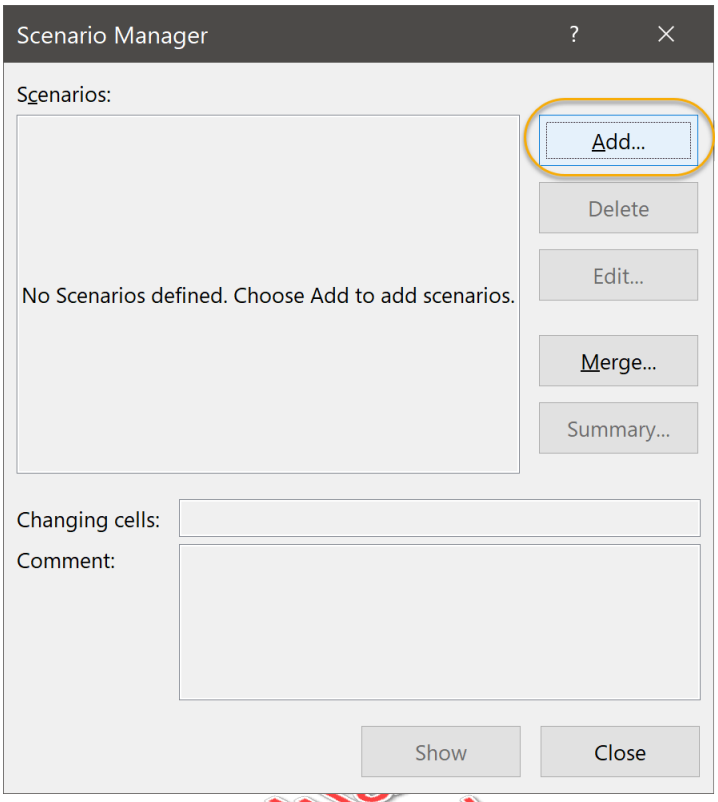
To manage what-if models so you can quickly access them, you can use the Scenario Manager.

To use the Scenario Manager:

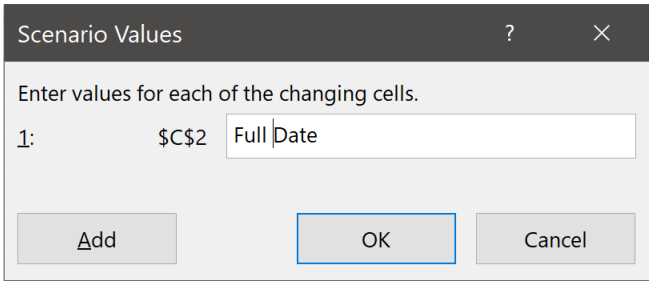
1. Select the **Data** tab, and in the **Forecast** group (**Data Tools** group in Excel 2013), select **What-If Analysis**, and then select **Scenario Manager**.



2. In the **Scenario Manager** dialog box, click **Add**. Type a name for the scenario in the **Scenario name** text box, and in the **Changing cells** text box, type the names of the cells you want to change and click OK.



3. In the **Scenario Values** dialog box that appears, type the values for the changing cells.



4. Click **Add** to add more scenarios and click **OK** when you are done.

❖ 1.13.6. Use Financial Functions

The Excel financial functions are complex financial formulas that contain multiple steps. These functions cover things such as calculating net present value, the depreciation of an asset, and loan payments, amongst others.

To access the financial functions, from the **Formulas** tab, in the **Function Library** group, select **Financial**.

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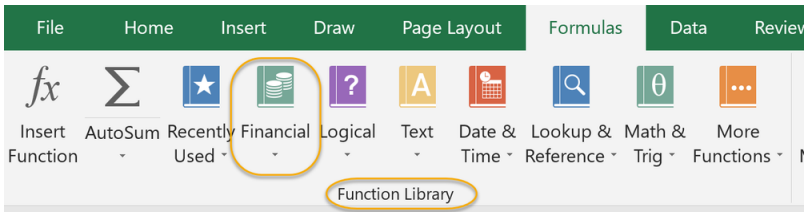

Conclusion

In this lesson, you learned:

- About naming and labeling cells and ranges of cells.
- To use names and labels in formulas.
- To create formulas that span multiple worksheets.
- To use the `IF` function and its variants in formulas.
- To use the `PMT` function to calculate payments for loans.
- To use the `LOOKUP` function.
- To use the `VLOOKUP` function.
- To use the `HLOOKUP` function.
- To use the `CONCAT` function to join the contents of numerous cells.
- To use the `TRANSPOSE` function.
- To use the `PROPER`, `UPPER`, and `LOWER` functions to alter the casing of text.
- To use the `LEFT`, `RIGHT`, and `MID` functions to return characters from the start or end of a string, or a specific number of text characters.
- To use the `YEAR`, `MONTH`, and `DAY` date functions.

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LESSON 2
Working with Lists

Topics Covered

☑ Converting data into tables.

☑ Removing duplicates.

☑ Sorting data.

☑ Filtering data.

☑ Subtotals.

☑ Grouping and ungrouping data.

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Introduction

Microsoft Excel treats all data in successive rows and columns as a list. For example, following is a list with three columns and seven rows:

	A	B	C	D
1	**Student**	**Score**	**Grade**	
2	Kate	75	C	
3	Jim	91	A	
4	Cullen	85	B	
5	Lucy	93	A	
6	Anne	65	D	
7	Paul	88	B	
8				

The image below includes three lists, two with four rows and three columns and one with nine rows and two columns:

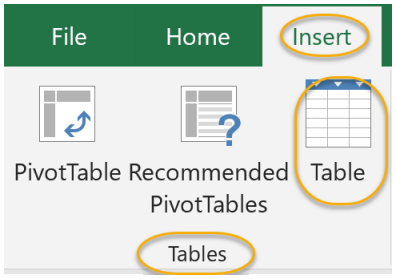
	A	B	C	D	E	F
1	**Student**	**Score**	**Grade**		**Student**	**Favorite Subject**
2	Kate	75	C		Kate	English
3	Jim	91	A		Jim	History
4	Cullen	85	B		Cullen	Math
5					Karen	Math
6	Lucy	93	A		Lucy	English
7	Anne	65	D		Anne	French
8	Paul	88	B		Paul	History
9	Nat	77	C		Nat	Russian
10						

2.1. Converting a List to a Table

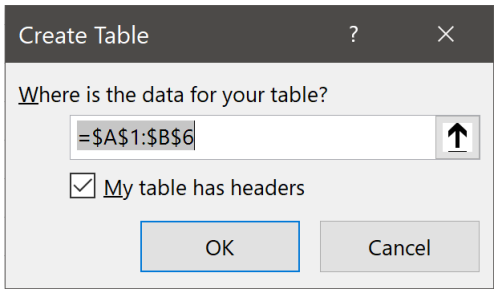
Converting a list to a table makes it very easy to format your data and to keep the formatting consistent as you make changes to the data. To convert a list to a table:

1. Verify that there are not any empty rows or columns within the list of data you wish to convert to a table. If there are, delete them.
2. Select a cell within the list you wish to convert to a table.
3. On the **Insert** tab, in the **Tables** group, click the **Table** command:

Evaluation Copy



4. In the **Create Table** dialog box, verify that Excel has correctly guessed the correct data range, check **My table has headers** if your table does have headers, and click **OK**:



EVALUATION COPY: Not to be used in class.

Exercise 10: Converting a List to a Table

5 to 10 minutes

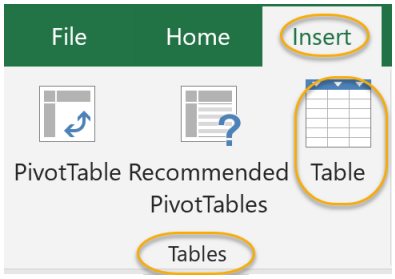
In this exercise, you will practice converting a list to a table.

Evaluation Copy

1. Open `List to Table.xlsx` from your `Excel2019.2/Exercises` folder.
2. In **Sheet1**, convert the list of houses to a table.
3. In **Sheet2**, convert the data into a table. Be sure to include all data in the worksheet in the table.

Solution

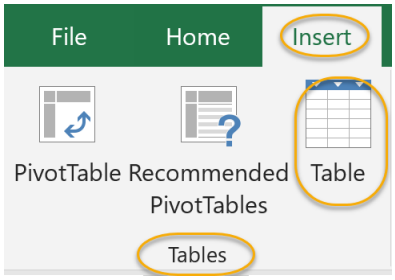
1. In **Sheet1**, convert the list of houses to a table.
   A. Select any cell within the list.
   B. On the **Insert** tab, in the **Tables** group, click the **Table** command:



   C. In the **Create Table** dialog box:
      i. Verify that Excel has correctly guessed the correct data range (**$A$1:$F$133**).
      ii. Check **My table has headers** if it isn't already checked.
      iii. Click **OK**.

Evaluation Copy

2. In **Sheet2**, convert the data into a table. Be sure to include all data in the worksheet in the table.
   A. Delete the blank row (row 5).
   B. Select any cell within the list.
   C. On the **Insert** tab, in the **Tables** group, click the **Table** command:



   D. In the **Create Table** dialog box:
      i. Verify that Excel has correctly guessed the correct data range (**$A$1:$C$8**).
      ii. Check **My table has headers** if it isn't already checked.

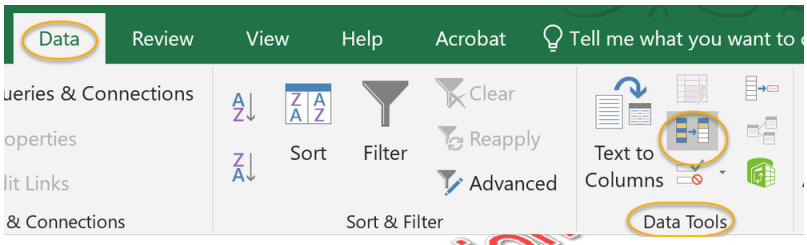
EVALUATION COPY: Not to be used in class.

iii. Click **OK**.

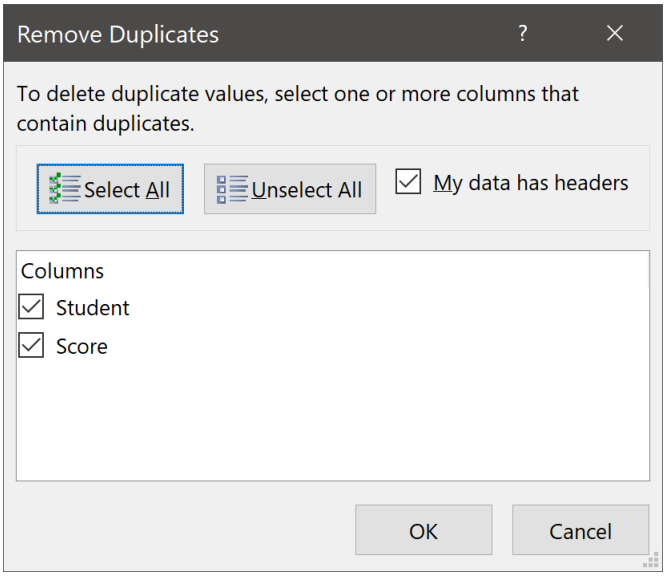
2.2. Removing Duplicates from a List

Excel makes it easy to remove duplicates from a list, which can be really helpful when working with long lists. To remove duplicates from a list:

1. Select a cell within the list that you wish to remove duplicates from.
2. On the **Data** tab, in the **Data Tools** group, click the **Remove Duplicates** command:



3. In the **Remove Duplicates** dialog box:
   A. Depending on whether your list has headers, check or uncheck **My data has headers**.
   B. Check those columns that contain duplicates you wish to remove.
   C. Click **OK**.



Evaluation Copy

4. Click **OK** in the dialog box that appears telling you how many values were found and removed, and how many values remain.

EVALUATION COPY: Not to be used in class.

Exercise 11: Removing Duplicates from a List

5 to 10 minutes

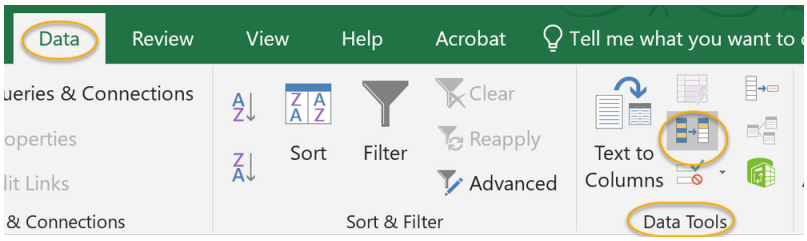
Evaluation Copy

In this exercise, you will practice removing the duplicates from a list.

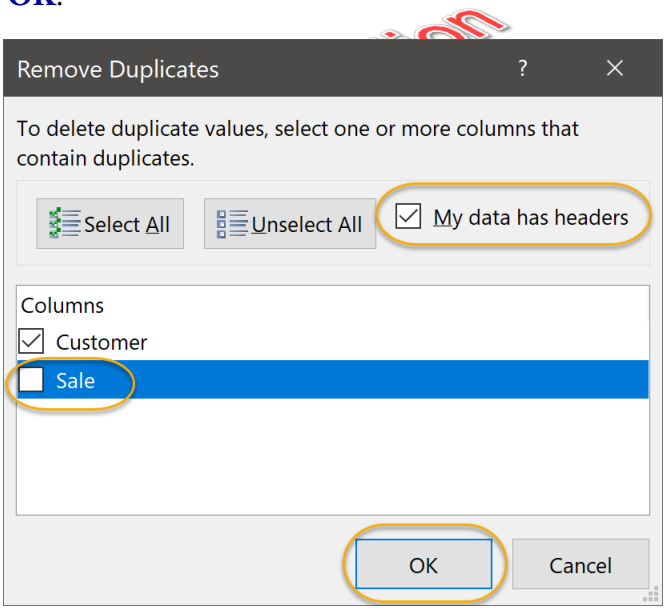
1. Open `Remove Duplicates.xlsx` from your `Excel2019.2/Exercises` folder.
2. The list in this worksheet shows all sales by customer. You would like to see a list showing each customer just once. Use the **Remove Duplicates** command to create this list.

Solution

1. Select any cell within the list.
2. On the **Data** tab, in the **Data Tools** group, click the **Remove Duplicates** command:



3. In the **Remove Duplicates** dialog box:
   A. Verify that **My data has headers** is checked.
   B. Under **Columns**, make sure **Customer** is checked and **Sale** is not checked.
   C. Click **OK**.



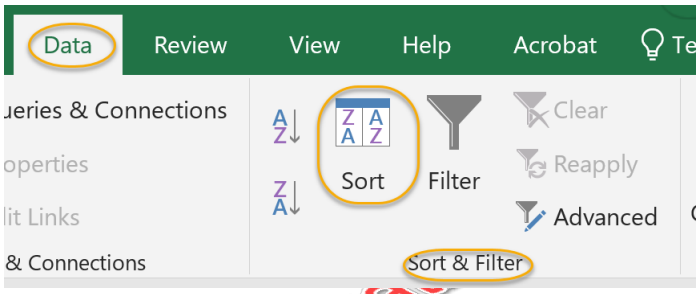
4. Click **OK** in the dialog box that appears telling you how many values were found and removed, and how many values remain:

EVALUATION COPY: Not to be used in class.

2.3. Sorting Data in a List

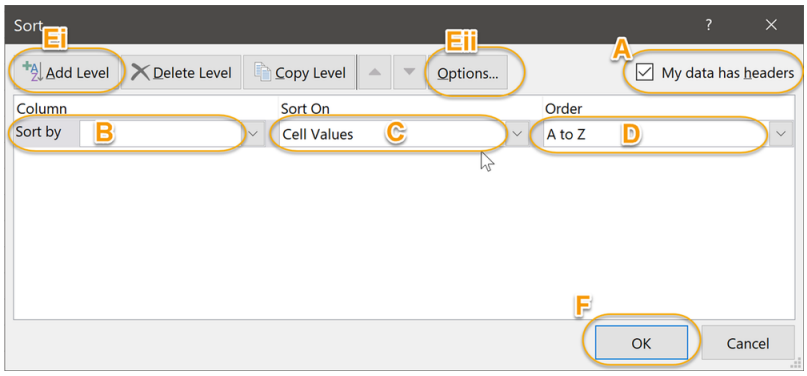
Sorting data allows you to see all related data in successive rows, which is both useful in and of itself and is necessary if you wish to add subtotals to your data. To sort data in a list in Microsoft Excel:

1. Select any cell within the list you wish to sort.
2. On the **Data** tab, in the **Sort & Filter** group, click the **Sort** command:



Evaluation Copy

3. In the **Sort** dialog box:
   A. Verify that **My data has headers** is checked if your list has a header row and not checked if it doesn't.
   B. Choose what column to sort by.
   C. Choose what to sort on. The default is to sort on *Values*, but you can also choose to sort on *Cell Color*, *Font Color*, and *Cell Icon*.
   D. Choose whether to sort ascending or descending.
   E. You can also:
      i. Add a level, meaning sort by one thing and then again by a second thing (click **Add Level**). Clicking **Add Level** adds a second set of *Column*, *Sort On*, and *Order* boxes to the **Sort** dialog box.
      ii. Sort left to right instead of top to bottom (click **Options**).
   F. Click **OK**.



EVALUATION COPY: Not to be used in class.

Exercise 12: Sorting Data in a List

10 to 20 minutes

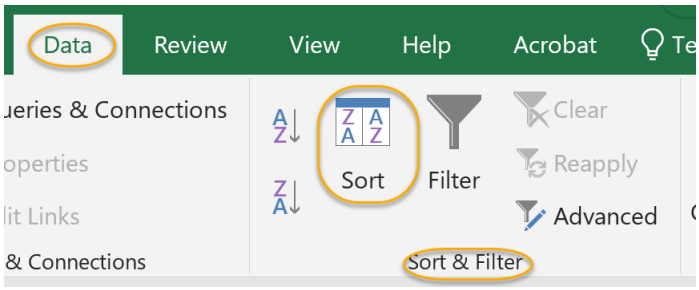
In this exercise, you will practice sorting data in a list.

Evaluation Copy

1. Open `Sort.xlsx` from your `Excel2019.2/Exercises` folder.
2. Sort the list by Town in ascending order.
3. Further sort the list by Square Feet in descending order.

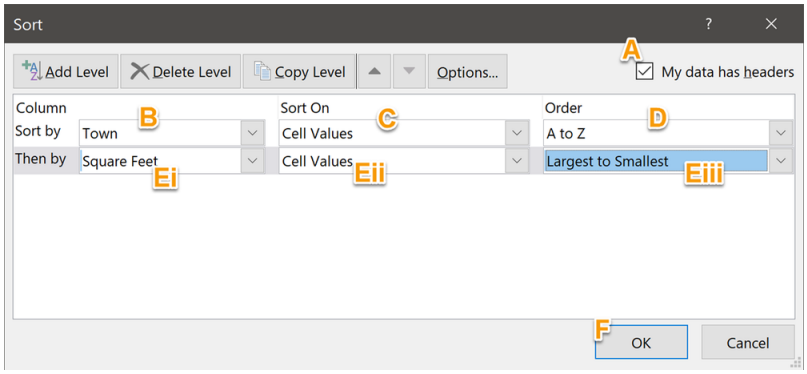
Solution

1. Select any cell in the list.
2. On the **Data** tab, in the **Sort & Filter** group, click the **Sort** command:



3. In the **Sort** dialog box:
   A. Verify that **My data has headers** is checked.
   B. Under **Column**, select to sort by **Town**.
   C. Under **Sort On**, accept the default, which is **Cell Values**.
   D. Under **Order**, select **A to Z** to sort ascending.
   E. Click **Add Level** and then:
      i. Under **Column**, select to sort by **Square Feet**.
      ii. Under **Sort On**, accept the default, which is **Cell Values**.
      iii. Under **Order**, select **Largest to Smallest** to sort descending.
   F. Click **OK**.

Evaluation Copy

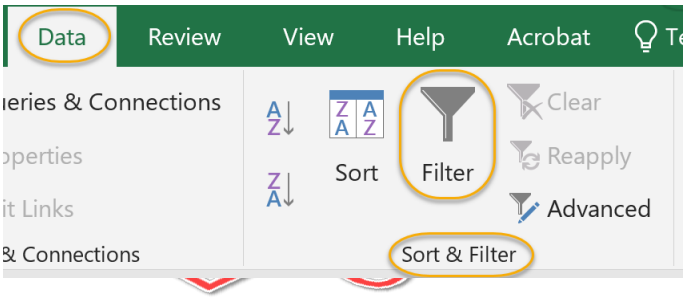


EVALUATION COPY: Not to be used in class.

2.4. Filtering Data in a List

Filtering data makes it easy to look at subsets of your data. To filter data in a list in Microsoft Excel:

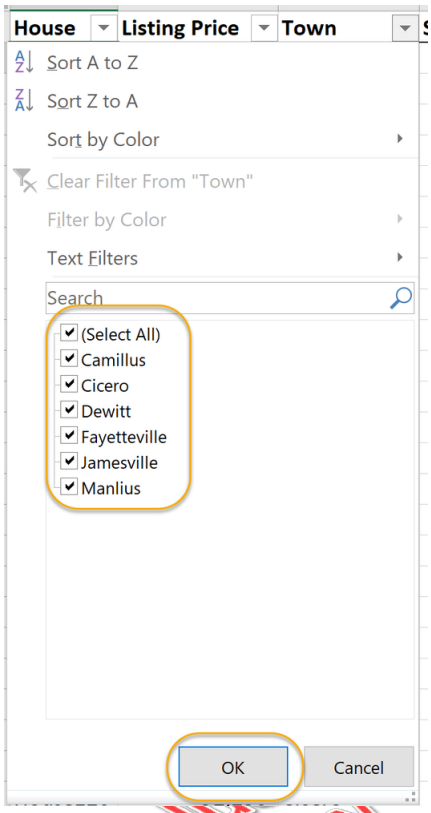
1. Select any cell in the list.
2. On the **Data** tab, in the **Sort & Filter** group, click the **Filter** command:



3. Note that every heading now includes a drop-down arrow:

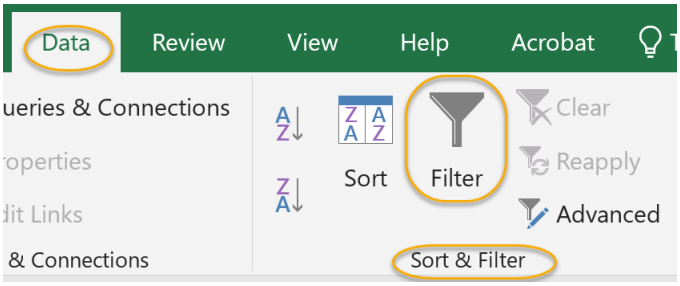
	A	B	C	D	E	F
1	House	Listing Price	Town	Square Fee	Bedroom	Bathroom
2	House1	129,000	Fayetteville	2,580	4	2
3	House10	79,000	Dewitt	1,580	4	3
4	House100	117,250	Dewitt	2,345	3	2

4. Click any of the drop-down arrows to see a list of all individual items in that column. By default all are selected, but you can de-select all or any using the check boxes. Click **OK** to see only the selected records:



Evaluation Copy

5. After setting the filter in one column, you can further filter your data by setting the filter in another column.
6. To remove your filters, simply click the **Filter** command again:

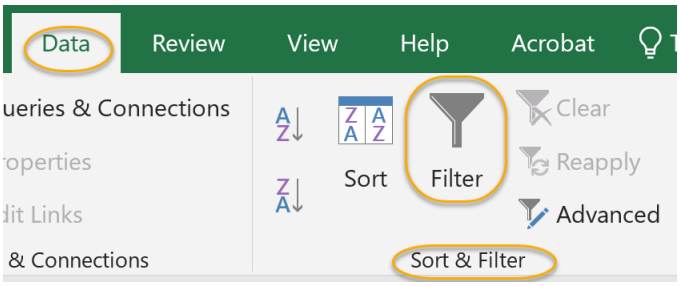


Advanced Filtering

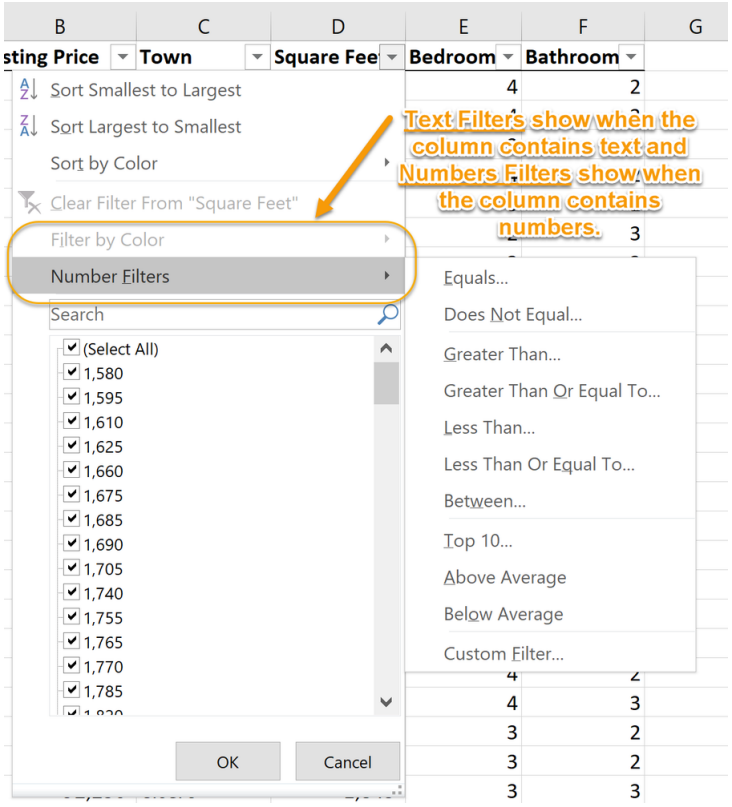
You can also use number filters, text filters, or color filters to filter based on specified criteria. To apply filters based on specific criteria:

1. These filters are also available from the filter drop-downs, so on the **Data** tab, in the **Sort & Filter** group, click the **Filter** command:

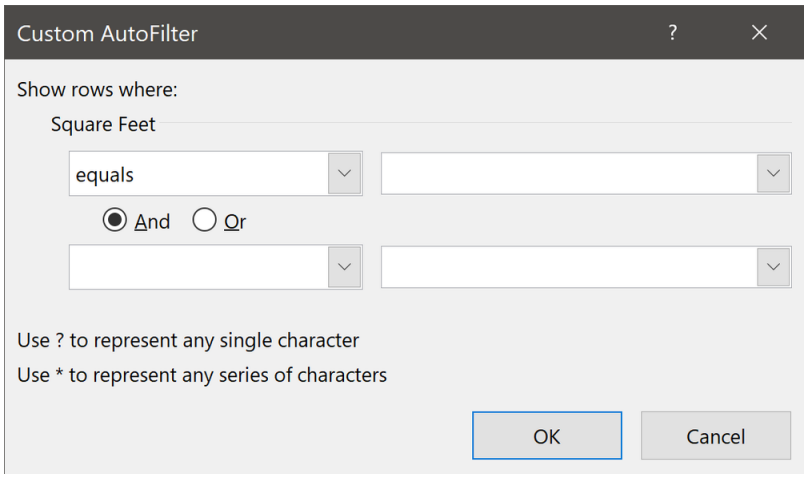
EVALUATION COPY: Not to be used in class.



2. Click any of the drop-down arrows and move your mouse over **Number Filters**, **Text Filters**, or **Color Filters** to see the list of options available.



3. Select any of the options to open the **Custom AutoFilter** dialog box, in which you set your criteria. Then click **OK**:



EVALUATION COPY: Not to be used in class.

Exercise 13: Filtering Data in a List

10 to 20 minutes

In this exercise, you will practice filtering data in a list.

Evaluation Copy

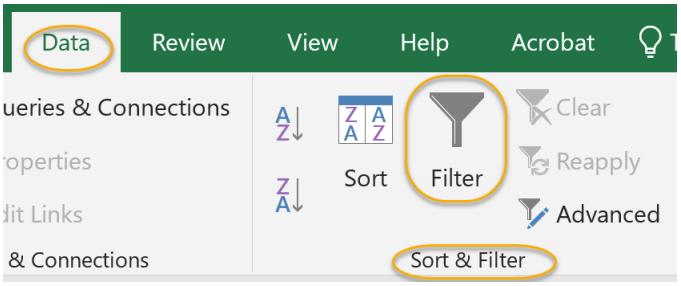
1. Open `Filter.xlsx` from your `Excel2019.2/Exercises` folder.
2. On **Sheet1**, filter the list to show only houses in Fayetteville with 3 bathrooms.
3. On **Sheet2**, filter the list to show only houses costing less than $100,000.
4. On **Sheet3**, filter the list to show only houses in Jamesville that have 4 bathrooms and cost less than $100,000.

Solution

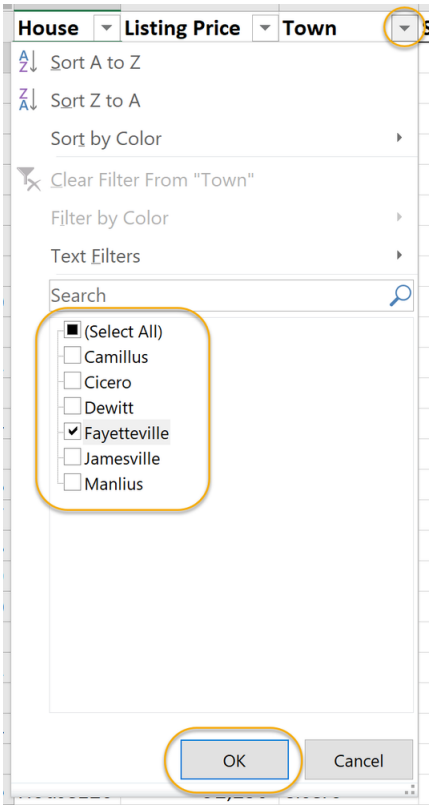
1. On **Sheet1**, filter the list to show only houses in Fayetteville with 3 bathrooms.

   A. Select any cell in the list.

   B. On the **Data** tab, in the **Sort & Filter** group, click the **Filter** command:

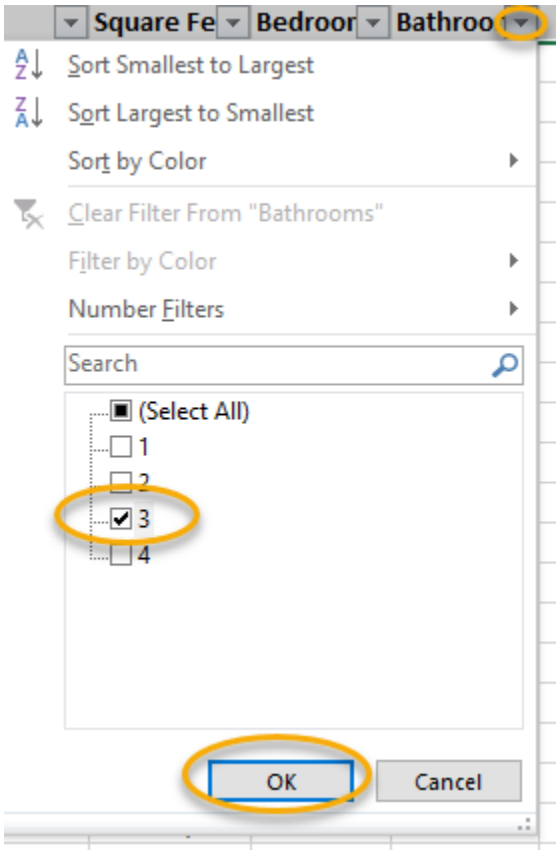


   C. Click the drop-down arrow next to "Town" and de-select everything except **Fayetteville**, and click **OK**:

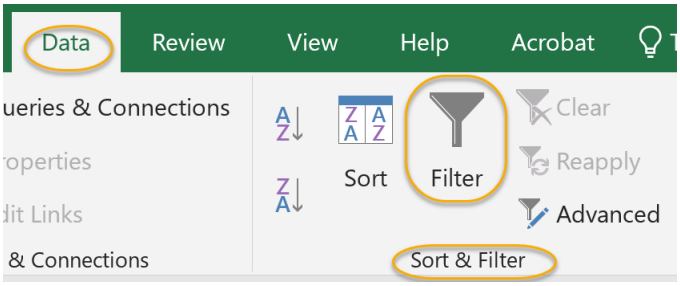


   D. Click the drop-down arrow next to "Bathrooms" and de-select everything except **3**, and click **OK**:

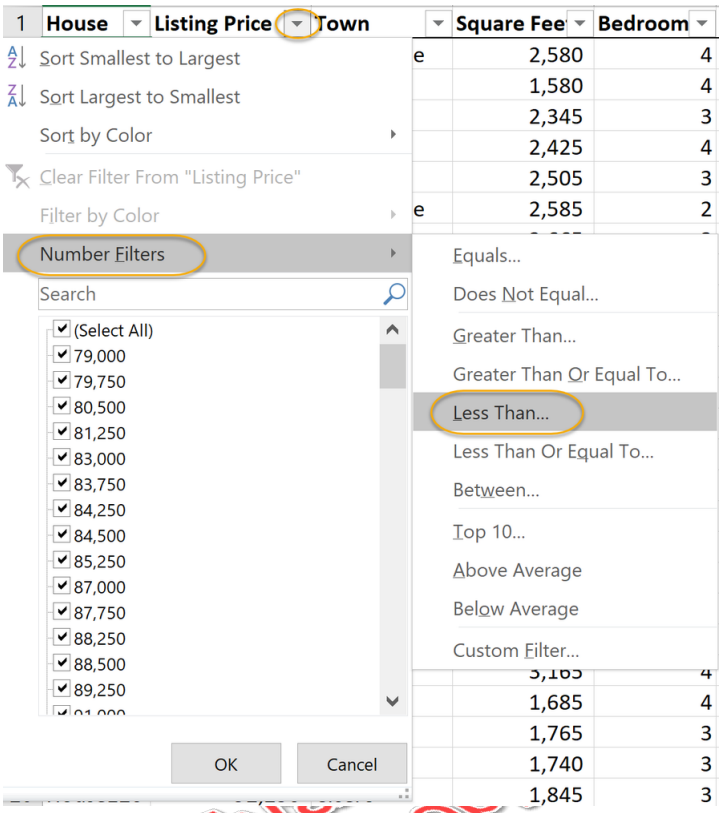
EVALUATION COPY: Not to be used in class.



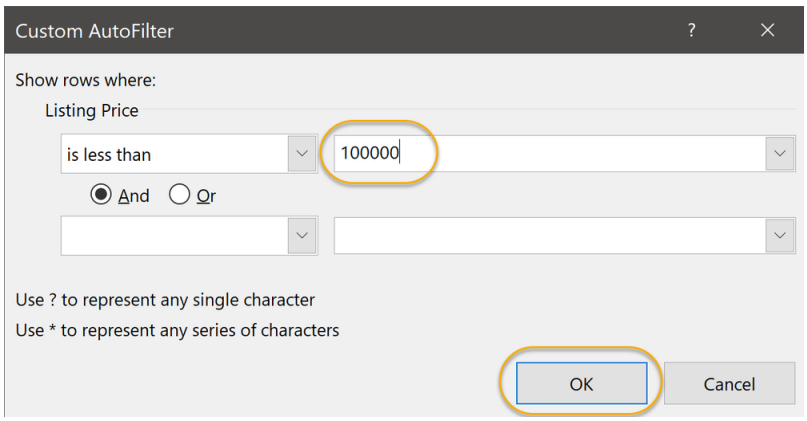
2. On **Sheet2**, filter the list to show only houses costing less than $100,000.
   A. Select any cell in the list.
   B. On the **Data** tab, in the **Sort & Filter** group, click the **Filter** command:



   C. Click the drop-down arrow next to "Listing Price," move your mouse over **Number Filters**, and select **Less Than**:



D. Fill in "100000" and click **OK**:

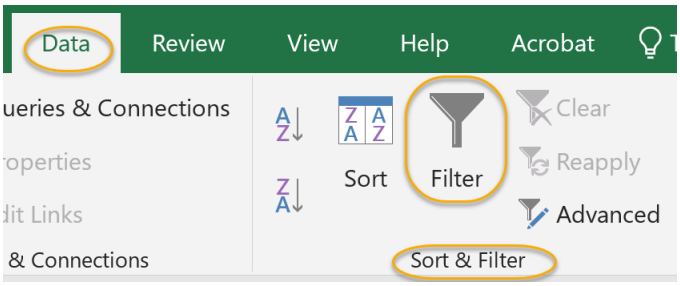


3. On **Sheet3**, filter the list to show only houses in Jamesville that have 4 bathrooms and cost less than $100,000.

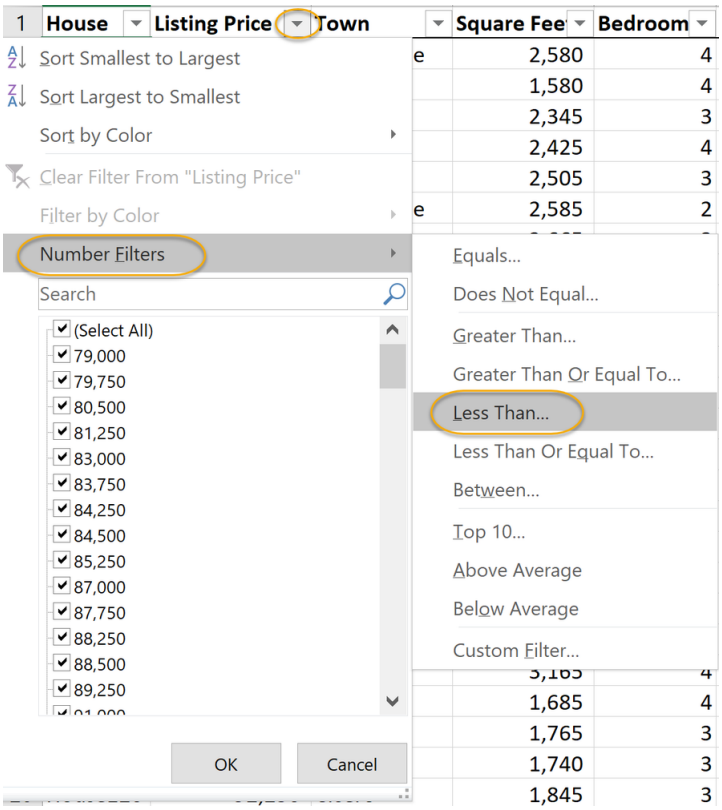
   A. Select any cell in the list.

   B. On the **Data** tab, in the **Sort & Filter** group, click the **Filter** command:

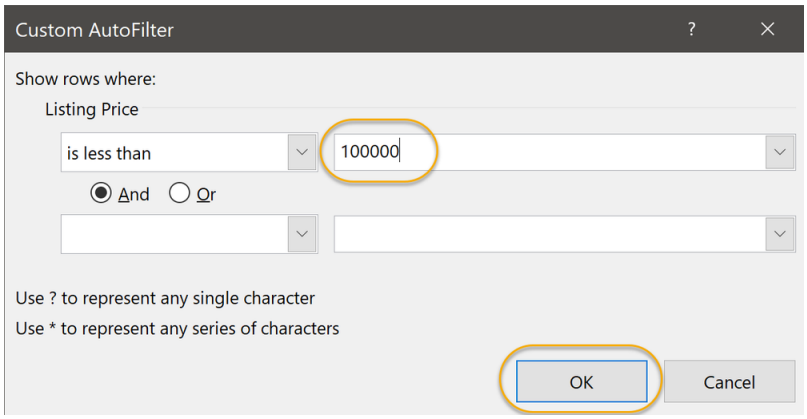
EVALUATION COPY: Not to be used in class.



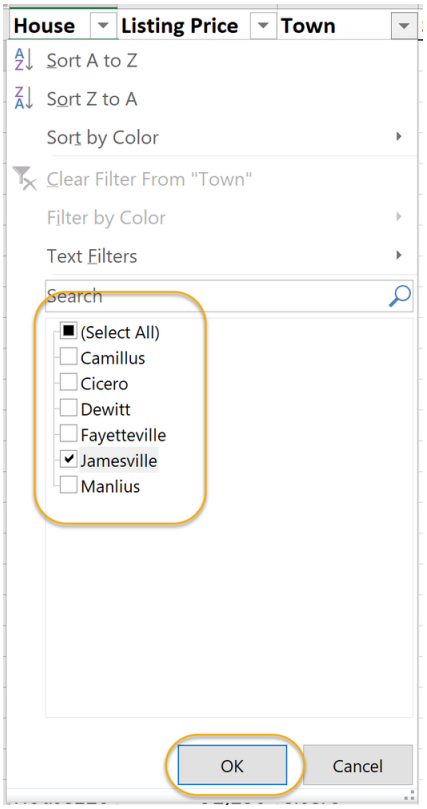
C. Click the drop-down arrow next to "Listing Price", move your mouse over **Number Filters**, and select **Less Than**:



D. Fill in "100000" and click **OK**:

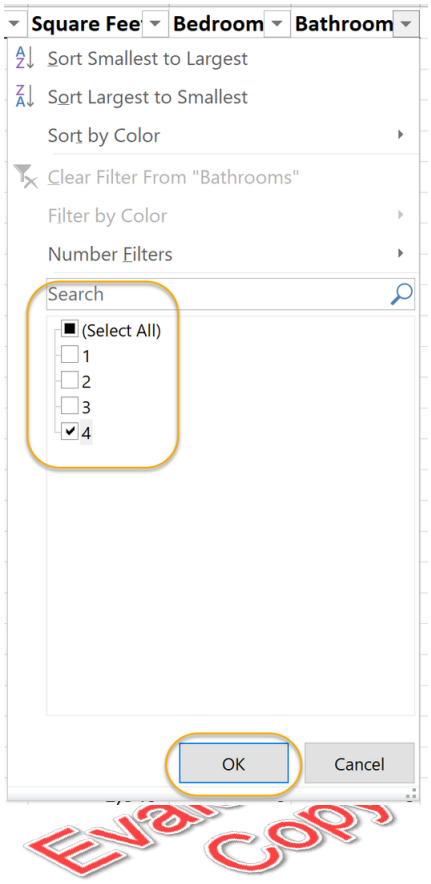


E. Click the drop-down arrow next to "Town" and de-select everything except **Jamesville**, and click **OK**:



F. Click the drop-down arrow next to "Bathrooms" and de-select everything except **4**, and click **OK**:

EVALUATION COPY: Not to be used in class.



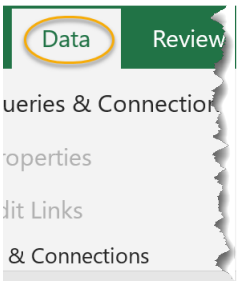
2.5. Adding Subtotals to a List

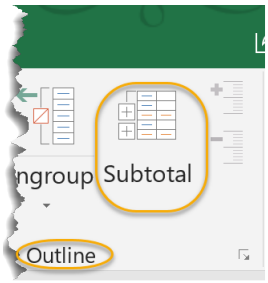
It is often desirable to add subtotals to your data. Fortunately, Excel can do this for you, including:

1. Adding the rows on which the subtotals will appear.
2. Adding the subtotals themselves.
3. Bolding the subtotals so they stand out.
4. Grouping your data to make it easy to show only the subtotals and totals.

To add subtotals to a list in Microsoft Excel:

1. Sort your data by the item(s) for which you wish to get subtotals.
2. Select any cell in the list.
3. On the **Data** tab, in the **Outline** group, click the **Subtotal** command:





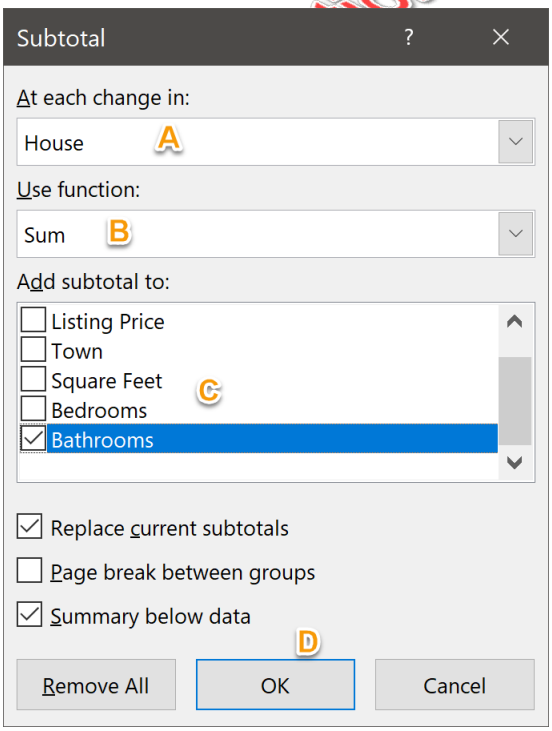
4. In the **Subtotal** dialog box:

   A. Choose what you want to acquire subtotals for in the **At each change in** box.

   B. Choose the function you want to use in the **Use function** box. The most common function to use for subtotals is *Sum*, but you can use *Count*, *Average*, *Min*, *Max*, and other functions.

   C. Choose what you want to add subtotals to. This is the column in which the function (*Sum*, *Count*, *Average*, etc.) will be applied.

   D. Click **OK**.



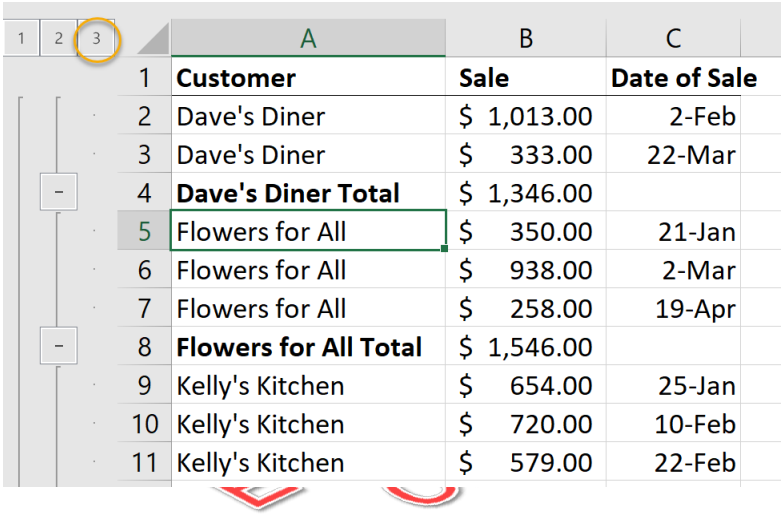
EVALUATION COPY: Not to be used in class.

❖ 2.5.1. Grouping and Ungrouping Data in a List

Again, when you add subtotals, Excel *groups* your data so you can collapse and uncollapse it to show all the data, just subtotals and totals, or just totals.

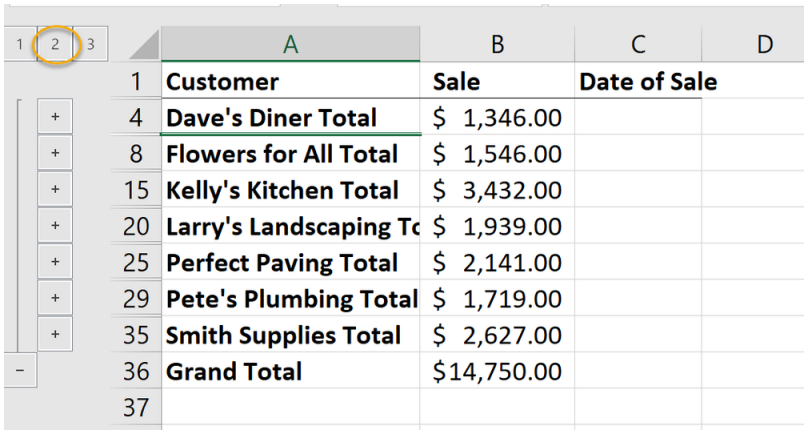
For example:

1. The following data includes subtotals and is currently set to show all data:



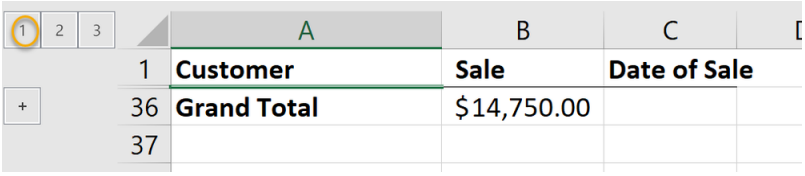
	A	B	C
1	**Customer**	**Sale**	**Date of Sale**
2	Dave's Diner	$ 1,013.00	2-Feb
3	Dave's Diner	$ 333.00	22-Mar
4	**Dave's Diner Total**	$ 1,346.00	
5	Flowers for All	$ 350.00	21-Jan
6	Flowers for All	$ 938.00	2-Mar
7	Flowers for All	$ 258.00	19-Apr
8	**Flowers for All Total**	$ 1,546.00	
9	Kelly's Kitchen	$ 654.00	25-Jan
10	Kelly's Kitchen	$ 720.00	10-Feb
11	Kelly's Kitchen	$ 579.00	22-Feb

2. The following image shows the same data in the same worksheet, but set (by clicking **2** in the upper left corner) to show only subtotals and totals:



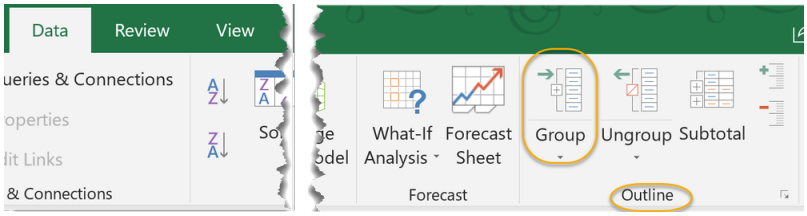
	A	B	C	D
1	**Customer**	**Sale**	**Date of Sale**	
4	**Dave's Diner Total**	$ 1,346.00		
8	**Flowers for All Total**	$ 1,546.00		
15	**Kelly's Kitchen Total**	$ 3,432.00		
20	**Larry's Landscaping Tc**	$ 1,939.00		
25	**Perfect Paving Total**	$ 2,141.00		
29	**Pete's Plumbing Total**	$ 1,719.00		
35	**Smith Supplies Total**	$ 2,627.00		
36	**Grand Total**	$14,750.00		
37				

3. And the following image again shows the same data, but set (by clicking **1** in the upper left corner) to show only totals:

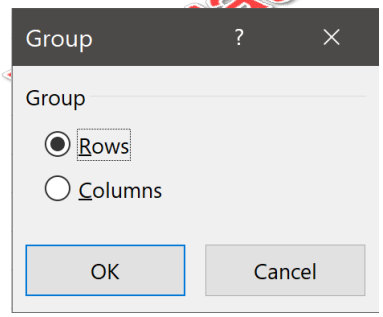


Adding subtotals is one way to group data in Excel, but you can easily group data in any list. To group data in Excel:

1. Select the rows or columns you wish to group.
2. On the **Data** tab, in the **Outline** group, click the **Group** command:

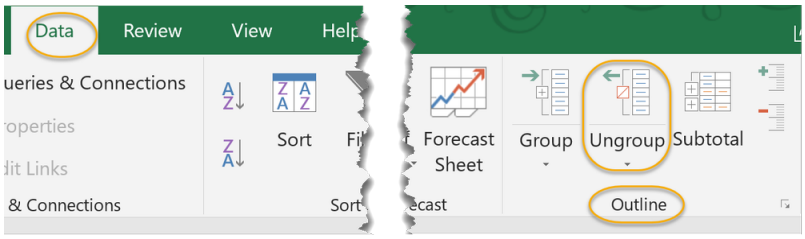


3. In the **Group** dialog box, select **Rows** or **Columns** and click **OK**:



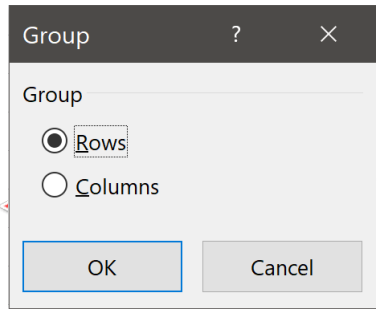
To ungroup data in Excel:

1. Select the rows or columns you wish to ungroup.
2. On the **Data** tab, in the **Outline** group, click the **Ungroup** command:



EVALUATION COPY: Not to be used in class.

3. In the **Group** dialog box, select **Rows** or **Columns** and click **OK**:



Exercise 14: Adding Subtotals to a List

10 to 20 minutes

Evaluation Copy

In this exercise, you will practice adding subtotals to a list in Microsoft Excel.

1. Open `Subtotals.xlsx` from your `Excel2019.2/Exercises` folder.
2. Add subtotals showing total sales by customer.

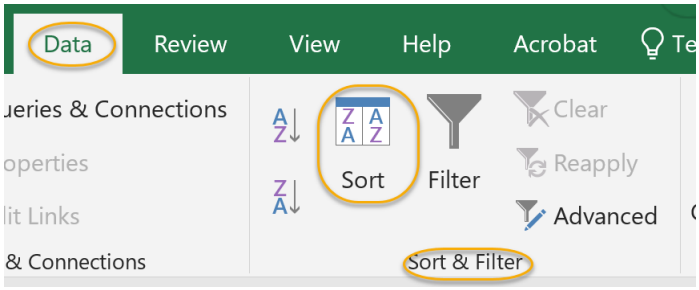
EVALUATION COPY: Not to be used in class.

Solution

1. In order to add subtotals showing total sales by customer, it is necessary to first sort by customer. To sort by customer:

   A. Select any cell within the list.

   B. On the **Data** tab, in the **Sort & Filter** group, click the **Sort** command:

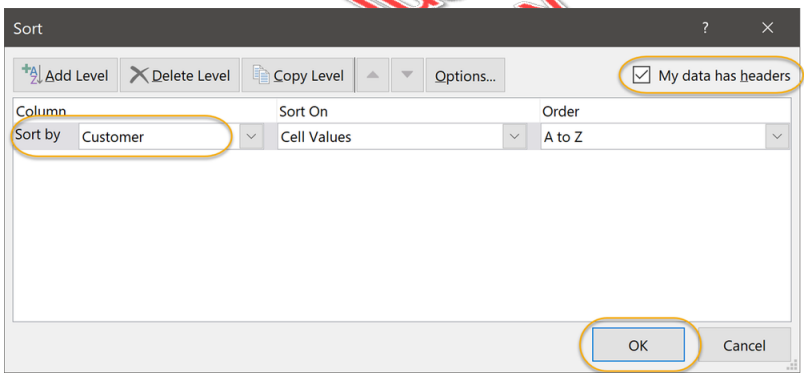


   C. In the **Sort** dialog box:

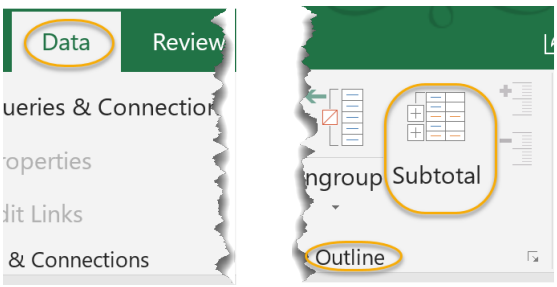
      i. Verify that **My data has headers** is checked.

      ii. Choose to sort by **Customer**.

      iii. Click **OK**.



2. On the **Data** tab, in the **Outline** group, click the **Subtotal** command:



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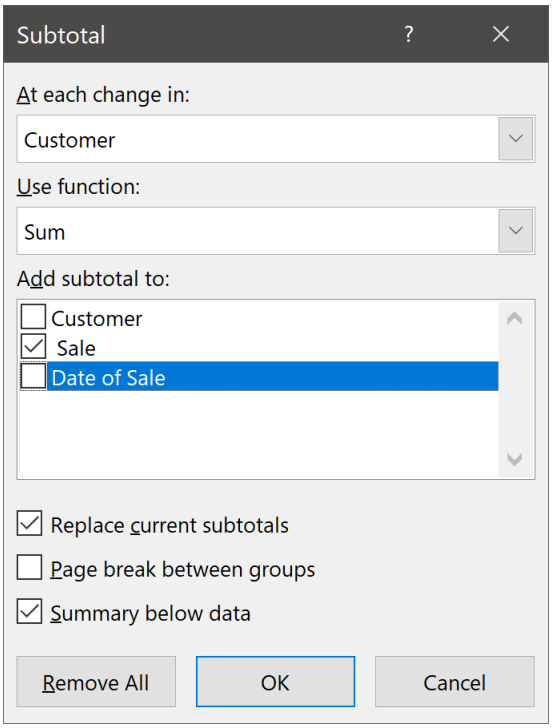
3. In the **Subtotal** dialog box:
   A. In the **At each change in** box, select **Customer**.
   B. In the **Use function** box, choose **Sum**.
   C. In the **Add subtotal to** box, check **Sale**.
   D. Click **OK**.



Conclusion

In this lesson, you learned to convert data into tables, to remove duplicates from tables, to sort data in Excel, to filter data in Excel, to use subtotals to automatically total related data, and to group and ungroup data.

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LESSON 3
Working with Illustrations

Topics Covered

☑ Adding pictures to worksheets.

☑ Adding Clip Art to worksheets.

☑ Inserting shapes to worksheets.

☑ Using SmartArt in worksheets.

Introduction

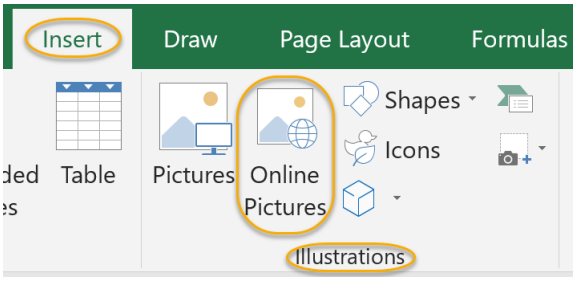
Adding illustrations to Microsoft Excel worksheets is a great way to improve their look and feel, and also to illustrate your points. Fortunately, it's easy to add pictures (your own or choose from a large library of pictures provided by Microsoft) and shapes.

Evaluation Copy

3.1. Working with Clip Art

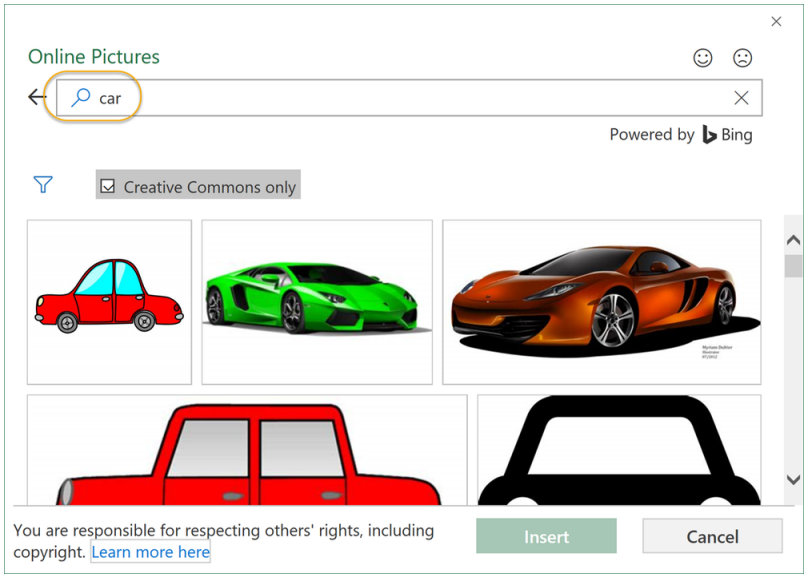
A large library of Clip Art, including drawings, videos, sounds, and photographs, is available from `Office.com` (`http://office.microsoft.com/en-us/images`). To insert Clip Art into your worksheet:

1. From the **Insert** tab, in the **Illustrations** group, click **Online Pictures**:



2. In the **Insert Pictures** dialog box that appears:
   A. Type in your search word(s) and press **Return**.

B. View the results of your search:



3. Double-click one of the results to add it to your worksheet.
4. Resize the image and/or cell to fit the image into your worksheet.

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Exercise 15: Working with Clip Art

5 to 10 minutes

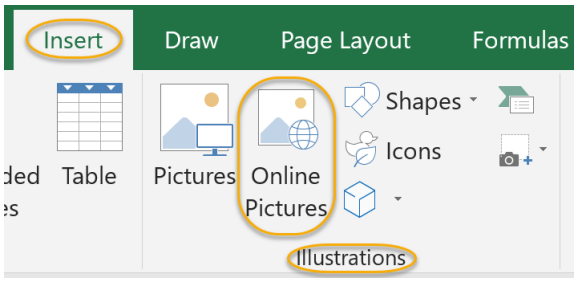
In this exercise, you will search for Clip Art available from Office.com and insert an image into a worksheet.

Evaluation Copy

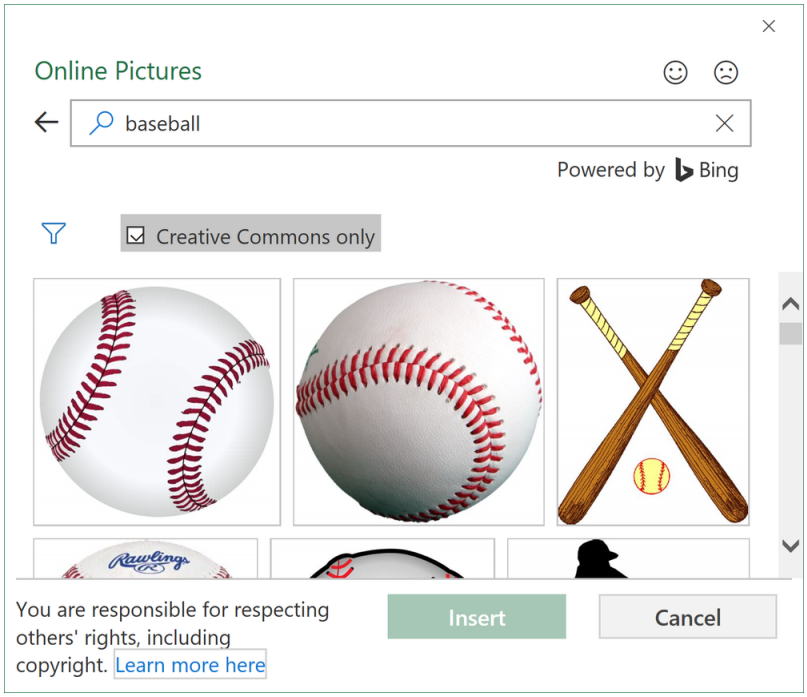
1. Open `Clip Art.xlsx` from your `Excel2019.2/Exercises` folder.
2. Insert a baseball-related picture from Clip Art at the top of the worksheet.
3. Resize the image and/or cell to fit the image into your worksheet.

Solution

1. From the **Insert** tab, in the **Illustrations** group, click **Online Pictures**:



2. In the **Insert Pictures** dialog box:
   A. Type the word "baseball" in the **Search for** box.
   B. Press **Enter**.



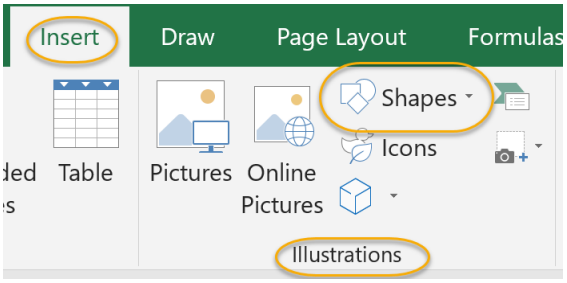
3. Double-click one of the results to add it to your worksheet.
4. Resize the image and/or cell to fit the image into your worksheet.

EVALUATION COPY: Not to be used in class.

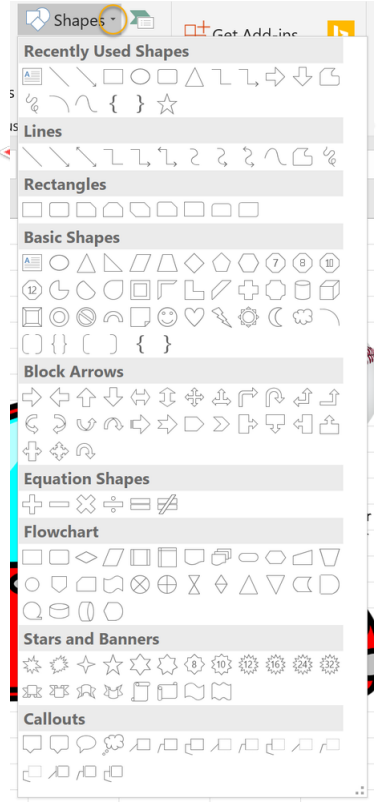
3.2. Using Shapes

You can easily add a wide variety of shapes to your Microsoft Excel worksheets, including squares, circles, stars, arrows, smiley faces, lines, equation shapes, callouts, and more. To insert a shape into a Microsoft Excel worksheet:

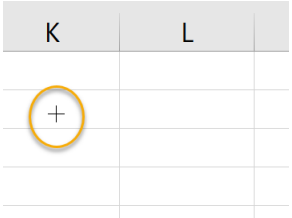
1. From the **Insert** tab, in the **Illustrations** group, click **Shapes**:



2. Select a shape by clicking it:

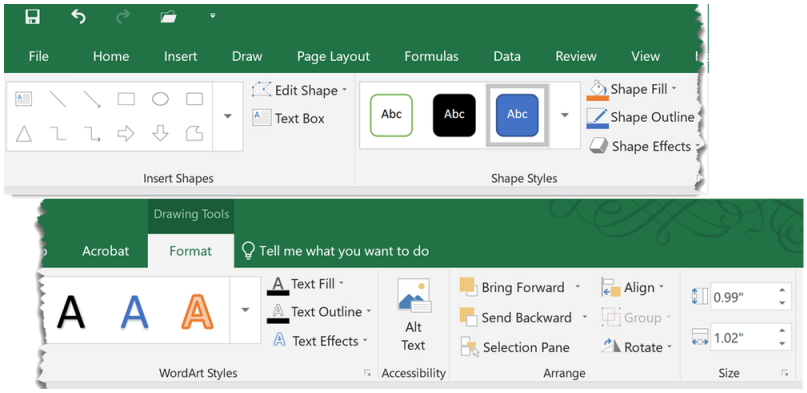


3. Your cursor will change to a plus sign:



4. Click in your worksheet where you want to place the shape, drag your mouse until the shape is the size you want it to be, and then release your mouse.

Selecting a shape in Excel brings up the **Drawing Tools** tab:



Quick Shape Formatting

There are preset Quick Shape styles available in Excel from the **Drawing Tools Format** tab.

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Take a minute to explore some of the commands on the **Drawing Tools** tab.

Exercise 16: Adding Shapes

5 to 10 minutes

Evaluation Copy

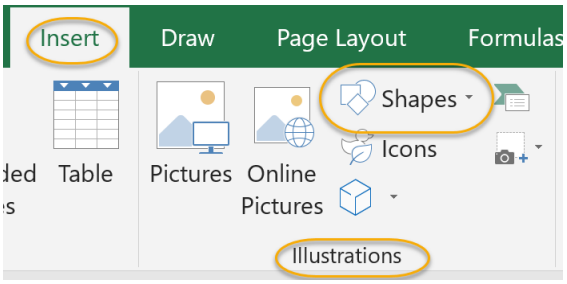
In this exercise, you will add a shape to a worksheet.

1. Open `Shapes.xlsx` from your `Excel2019.2/Exercises` folder.
2. Insert a smiley face shape to the right of the baseball mitt.

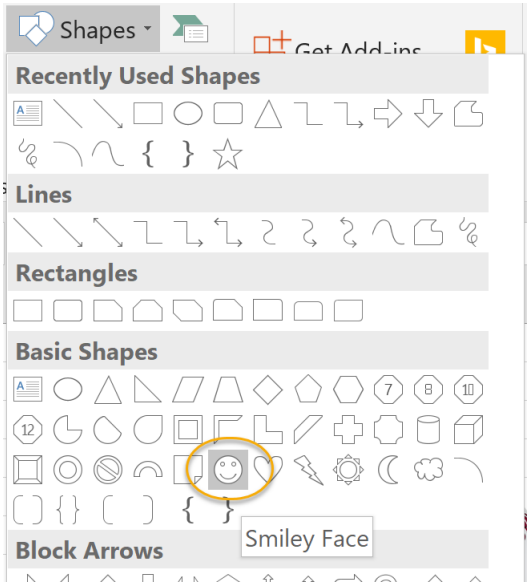
EVALUATION COPY: Not to be used in class.

Solution

1. From the **Insert** tab, in the **Illustrations** group, click **Shapes**:

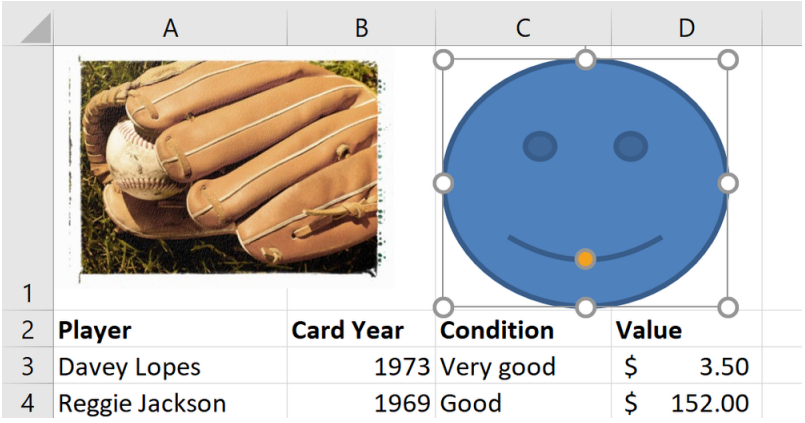


2. Select the smiley face shape by clicking it:



3. Click in your worksheet to the right of the baseball mitt, drag your mouse until the shape is the size you want it to be, and then release your mouse:

EVALUATION COPY: Not to be used in class.

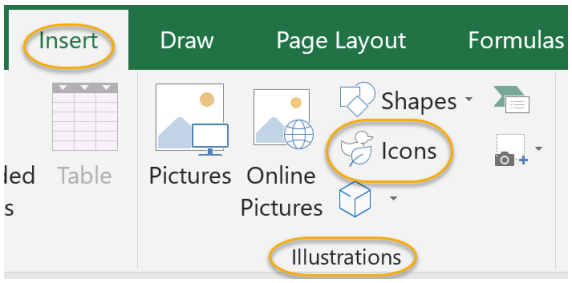


	A	B	C	D
1				
2	**Player**	**Card Year**	**Condition**	**Value**
3	Davey Lopes	1973	Very good	$ 3.50
4	Reggie Jackson	1969	Good	$ 152.00

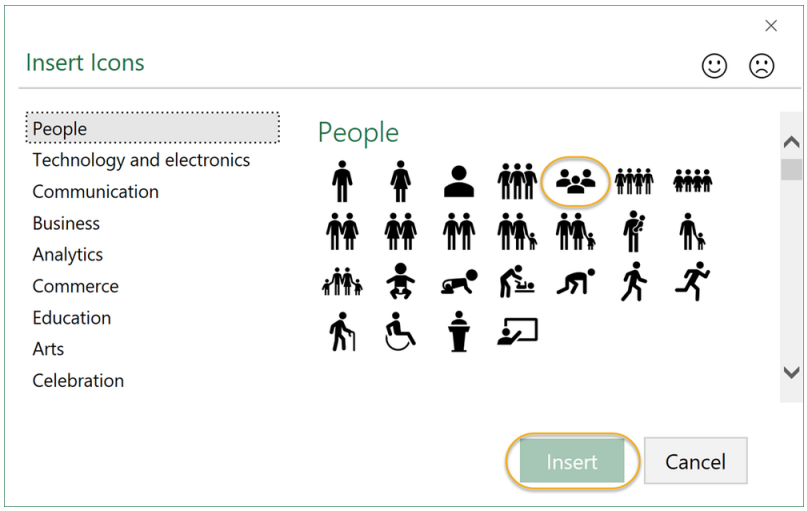
Evaluation Copy

3.3. Working with Icons

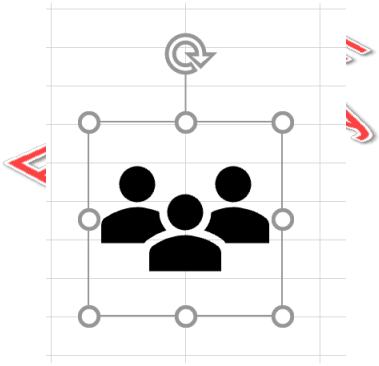
New in Excel 2019 is the ability to insert Scalable Vector Graphics (SVGs), or icons. To do so, from the **Insert** tab in the **Illustrations** group, select **Icons**.



The **Insert Icon** dialog box opens. To insert an icon, click it and then click **Insert**.



The icon is now inserted into your worksheet. You can click and drag to move it or rotate it.

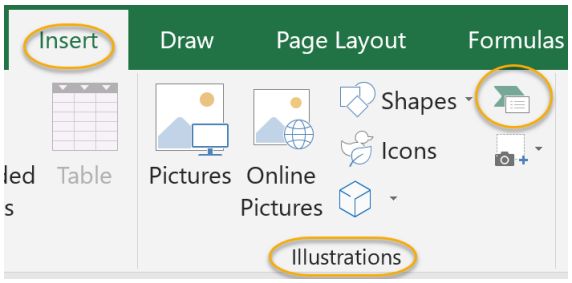


3.4. Working with SmartArt

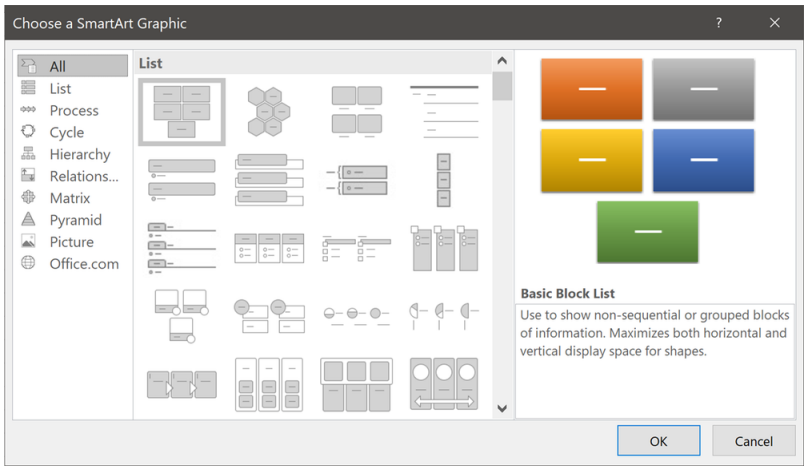
SmartArt diagrams include *process* diagrams, *list* diagrams, *hierarchy* diagrams, *pyramid* diagrams, and much more. To insert SmartArt into a Microsoft Excel workbook:

1. Place your cursor in the location in your worksheet where you want your SmartArt graphic to appear.
2. From the **Insert** tab, in the **Illustrations** group, click **SmartArt**:

EVALUATION COPY: Not to be used in class.



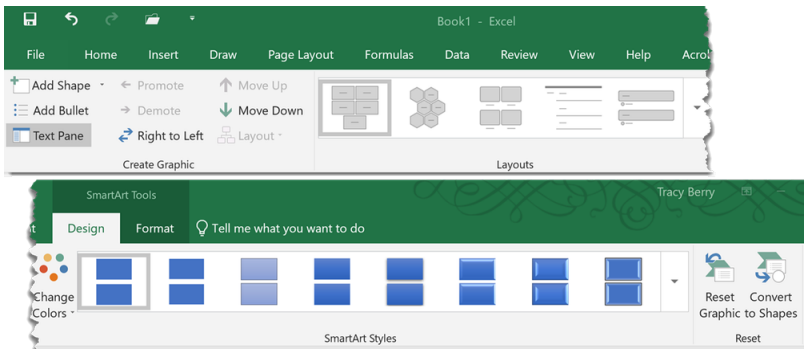
3. In the **Choose a SmartArt Graphic** dialog box, select a SmartArt graphic to preview it on the right:



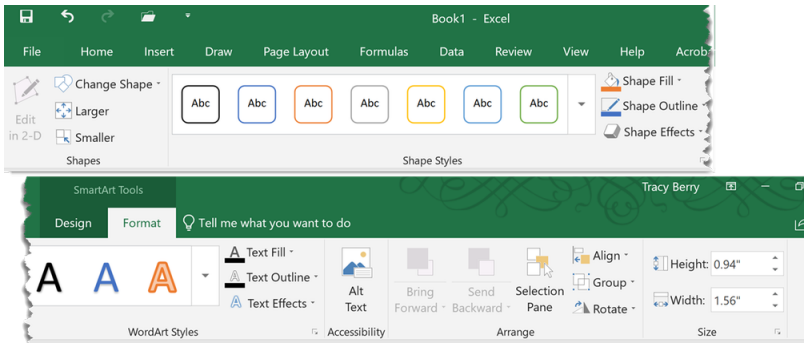
4. Click **OK** to add the SmartArt graphic to your worksheet.

Selecting a SmartArt diagram in Excel brings up the **SmartArt Tools** tabs:

1. **Design**:



2. **Format**:



3.5. Using Office Ink

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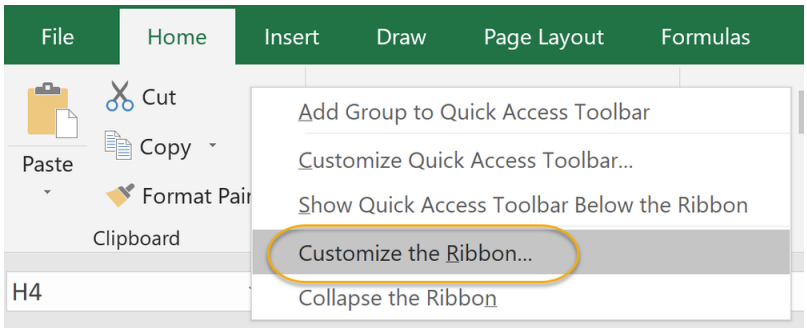
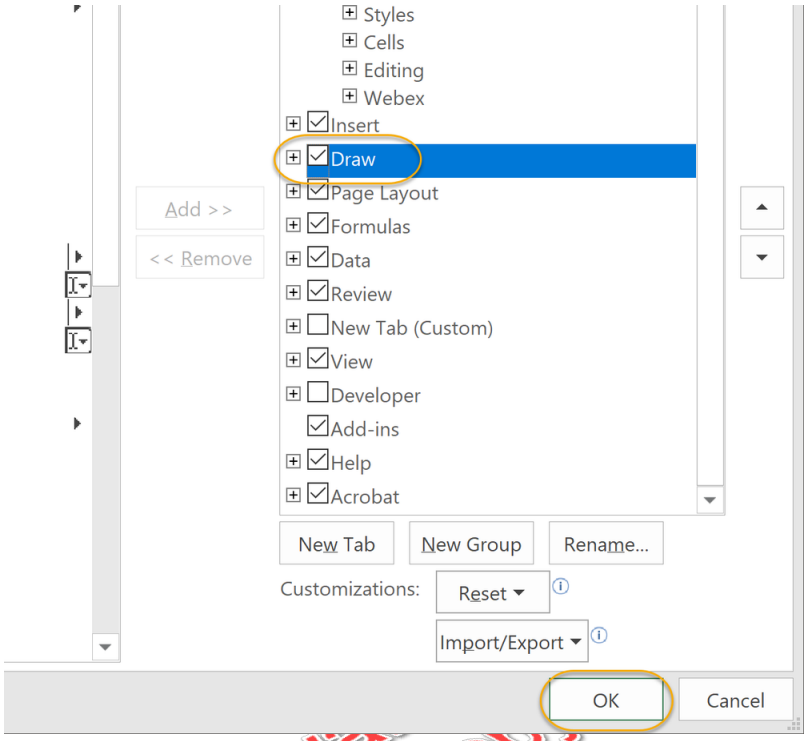
If you are using a touch-enabled device, you will see the **Draw** tab on the Ribbon in Excel. If you are not, you can add that tab to your Ribbon by right-clicking the Ribbon and selecting **Customize the Ribbon**



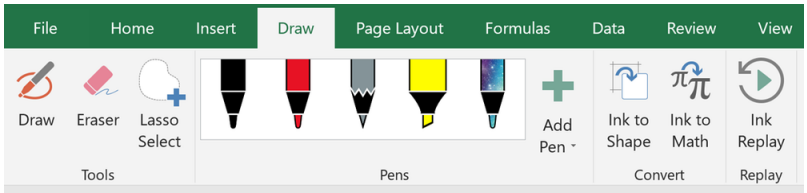
.

Then, check the **Draw** check box and click **OK**.

EVALUATION COPY: Not to be used in class.



Here are the options available on the tab. These are the Microsoft Ink features.



You can use the pens to write and highlight. Each pen has various thickness and color options. Use the Eraser to erase your ink. The **Lasso Select** tool allows you to select a shape. The **Ink to Shape** tool allows you to convert ink drawings to shapes. **Ink to Math** allows you to convert drawn data into text.

Conclusion

In this lesson, you learned to enhance your Microsoft Excel worksheets with illustrations. You learned to search for and insert Clip Art, to add and edit shapes, and to add and format SmartArt.

EVALUATION COPY: Not to be used in class.

LESSON 4
Visualizing Your Data

Topics Covered

☑ Charts.

☑ Selecting data.

☑ Data labels.

☑ The legend.

☑ The chart title.

☑ Adding a picture or shape to a chart.

☑ Changing the way text displays in a chart.

☑ Changing the fill color of a chart.

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☑ Format objects.

☑ Custom chart templates.

Introduction

It is often useful to visualize data, and it's easy to do so in Excel using charts. The most commonly used chart types are:

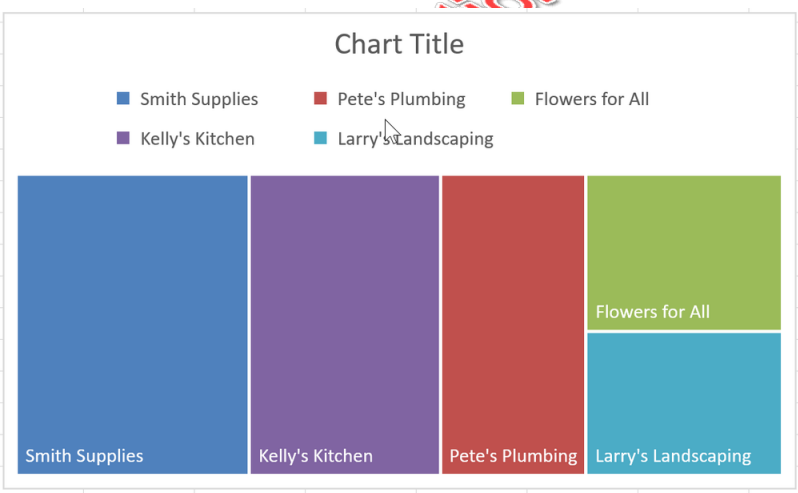
1. **Column**. Column charts are commonly used to compare values of different items.
2. **Line**. Line charts are commonly used to show trends.
3. **Pie**. Pie charts are useful when you have only one set of data and want to show how much of the whole each item accounts for.
4. **Bar**. Bar charts are similar to column charts except that the bars are displayed horizontally instead of vertically.
5. **Area**. Area charts are similar to line trends in that they show trends, but the data is stacked, making it easy to compare different values over time.

6. **XY (Scatter)**. XY (scatter) charts are used to display two variables, one along the X-axis and one on the Y-axis, for a single set of data.

4.1. New Charts

Excel recently introduced a number of new chart types to help you visualize your data. These include:

- **Treemap**: The treemap chart can be used to spot patterns; it organizes your data in a hierarchical view. The trees "branches" are rectangles and smaller rectangles. It uses color and proximity to organize data into categories.



- **Sunburst**: This chart is also known as a ring chart. A sunburst chart displays data hierarchically. The innermost rings are the top of the hierarchy.

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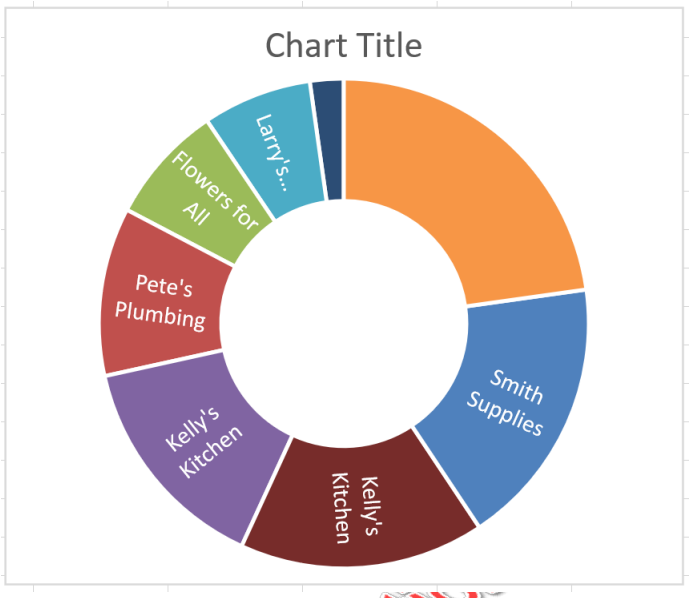
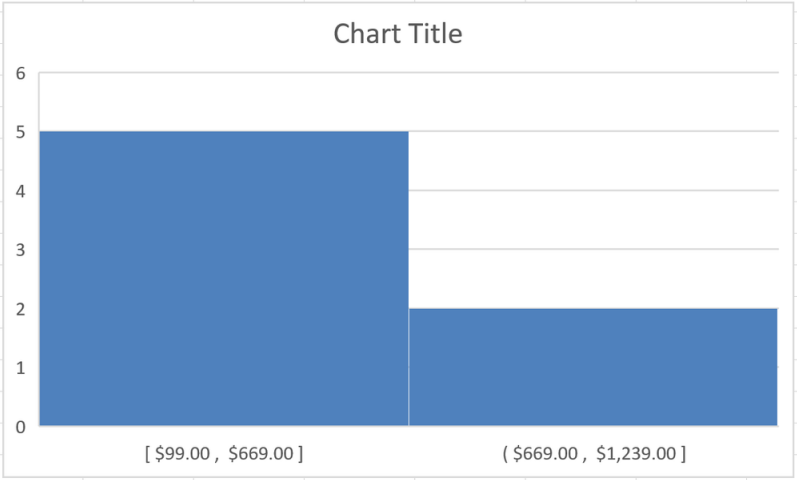
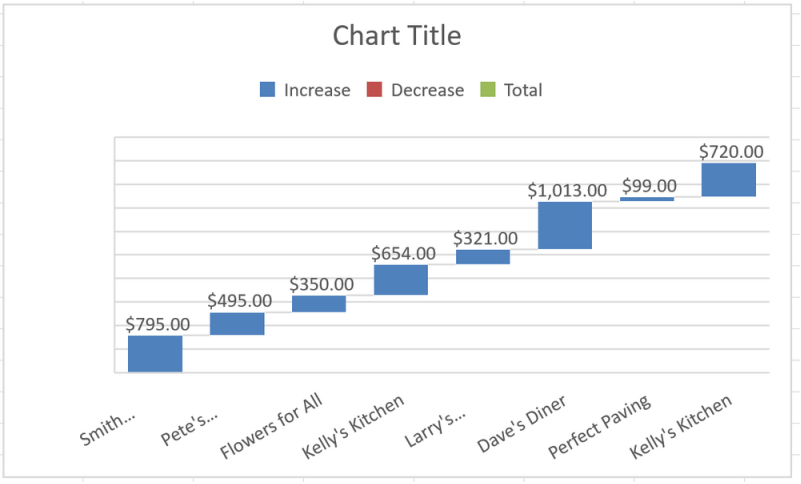


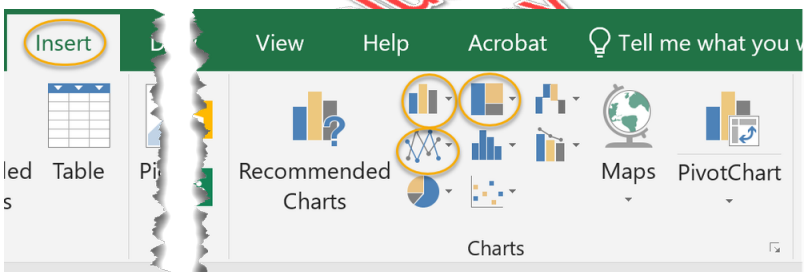
- **Histogram**: A histogram chart is used to display frequency data in columns.



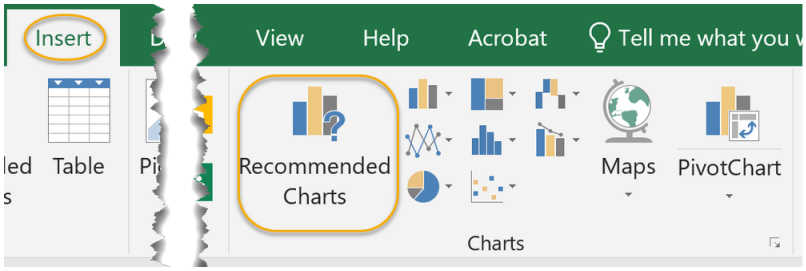
- **Waterfall**: The waterfall chart is useful when you are adding and subtracting data. This type of chart keeps a running total of the data, displayed as columns.



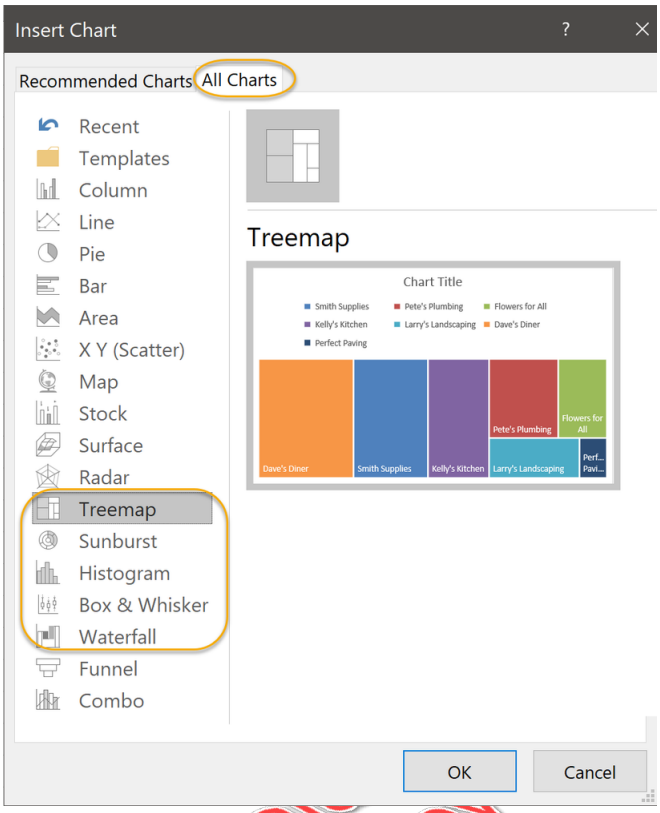
The treemap and sunburst charts are available from the **Insert Hierarchy Chart** drop-down from the **Insert** tab, **Charts** group. Select **Insert Waterfall or Stock Chart** for the waterfall chart; select **Insert Statistical Chart** for the histogram chart.



You can view each chart by selecting **Recommended Charts**, and then clicking the **All Charts** tab.



EVALUATION COPY: Not to be used in class.



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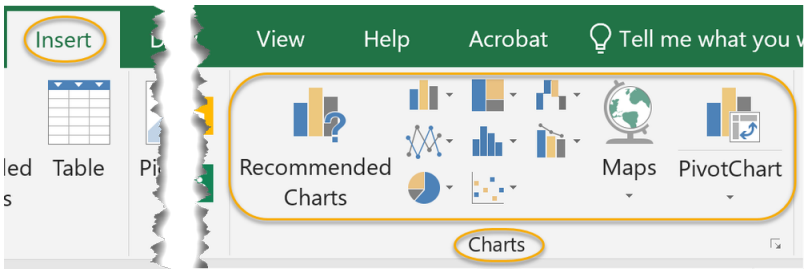
Additional charts include **Funnel charts**, used to show smaller stages in a process, and **Map charts**, used to compare values across geographic regions.

Take a Few Minutes
Take a few minutes to explore some of the many charts available in Excel.

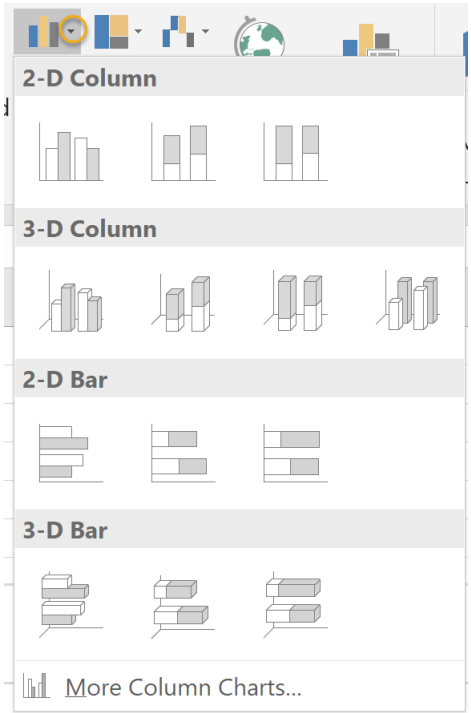
4.2. Inserting Charts

To insert a chart into an Excel workbook:

1. Select the data you wish to display. If Excel recognizes your data as being a list, you can select any cell within the list.
2. On the **Insert** tab, in the **Charts** group, select the type of chart you wish to insert by clicking it:

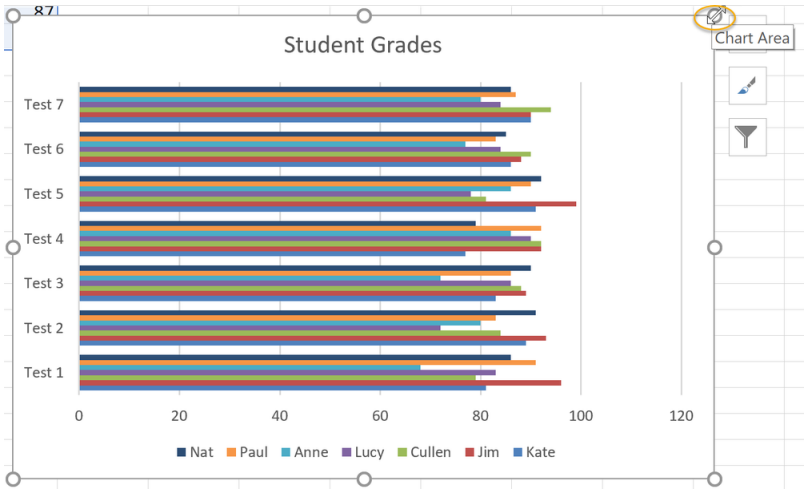


3. Select a specific chart. The following image shows the charts available if you click the **Insert Column or Bar Chart** command:



You can easily resize charts, as well as graphs, by clicking and dragging one of the resize handles at the edges of the chart or graph. Hover the cursor over the handle until it turns into a two-sided arrow:

EVALUATION COPY: Not to be used in class.



4.3. Using the Chart Recommendation Feature

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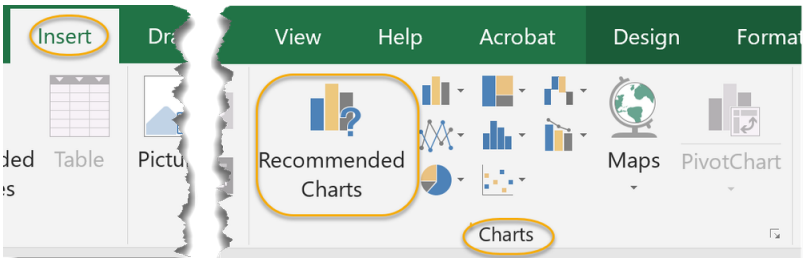
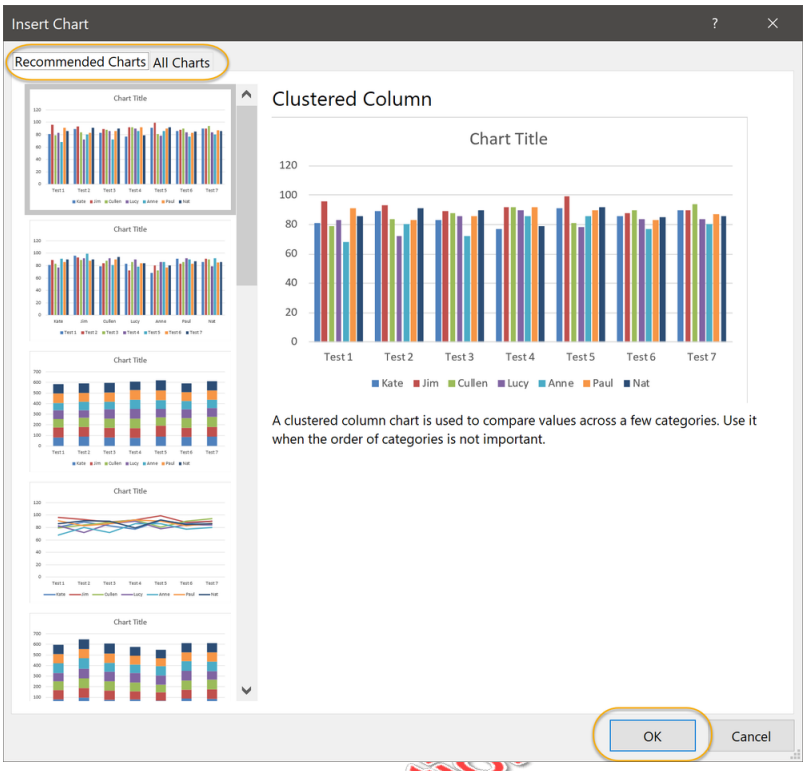
The Chart Recommendation feature can assist you by providing charts that suit your data.

To use the Chart Recommendation feature:

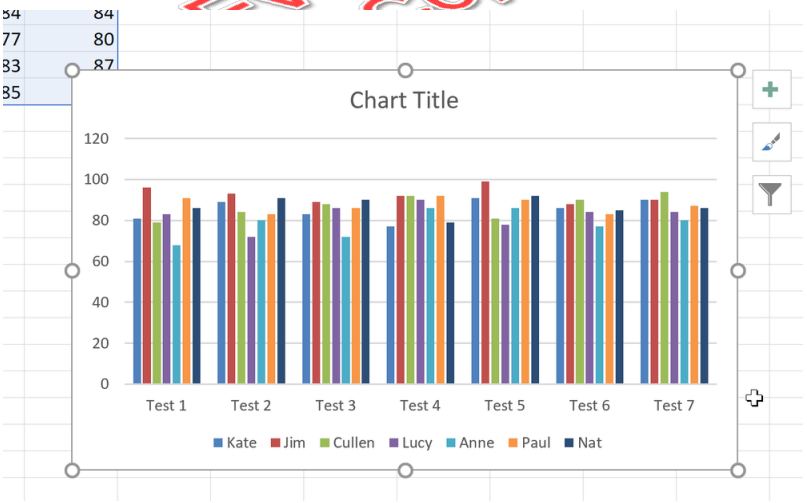
1. Select the cells of data for which you want to create the chart.
2. Select the **Insert** tab, and in the **Charts** group, click **Recommended Charts**.



3. Excel displays the **Insert Chart** dialog box, displaying the **Recommended Charts** tab (as well as the **All Charts** tab).



4. To select a chart, select it and click **OK**.

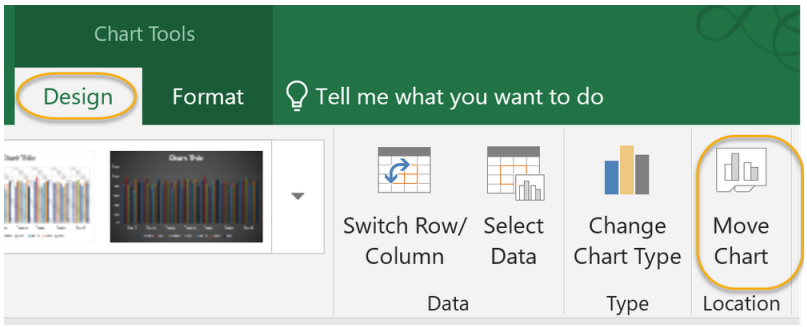


Move a Chart to a Chart Sheet

You can move an embedded chart to its own chart worksheet.

Click the chart, and from the **Chart Tools Design** tab, from the **Actions** group, select **Move Chart**.

EVALUATION COPY: Not to be used in class.



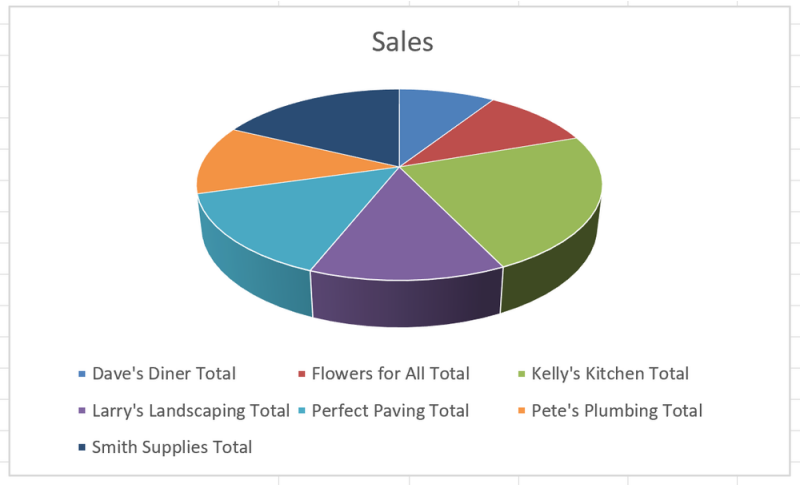
The chart now appears on a standalone worksheet, rather than embedded in the original worksheet.

Exercise 17: Inserting Charts

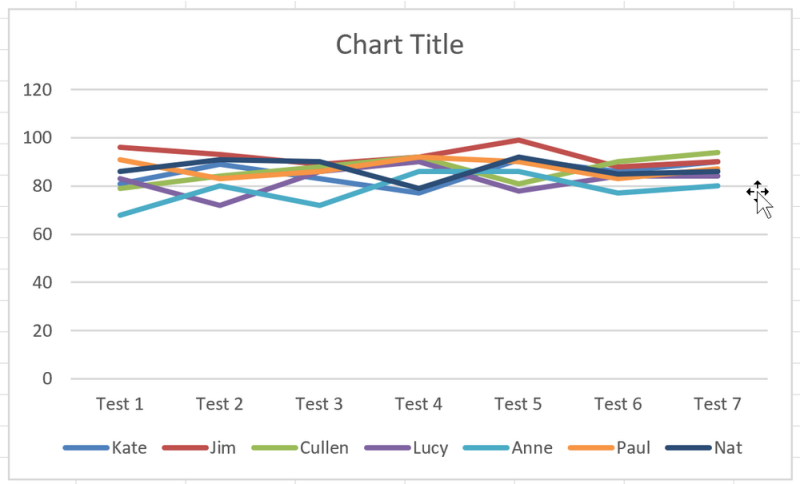
15 to 25 minutes

In this exercise, you will practice inserting charts in Microsoft Excel.

1. Open `Charts.xlsx` from your `Excel2019.2/Exercises` folder.
2. In **Sheet1**, insert a pie chart that looks like the one below:



3. In **Sheet2**, insert a line chart that looks like the one below:



4. In **Sheet3**, insert a column chart that looks like the one below:

EVALUATION COPY: Not to be used in class.

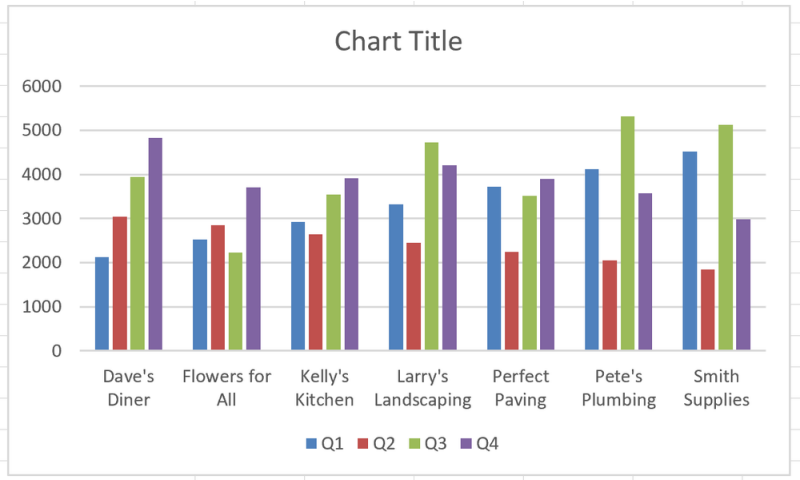


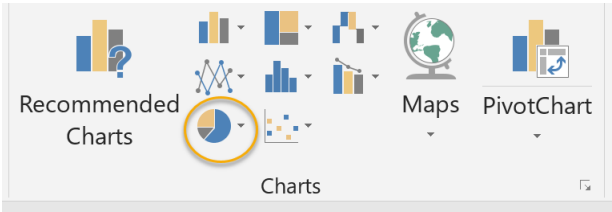
Chart Title
6000
5000
4000
3000
2000
1000
0
Dave's Diner
Flowers for All
Kelly's Kitchen
Larry's Landscaping
Perfect Paving
Pete's Plumbing
Smith Supplies
Q1
Q2
Q3
Q4

Solution

1. To insert a pie chart in **Sheet1**:

   A. Select cells **A1:B35** (do not remove subtotals or display all the data) or select any cell in the range.

   B. On the **Insert** tab, in the **Charts** group, click the **Insert Pie or Doughnut Chart** command:



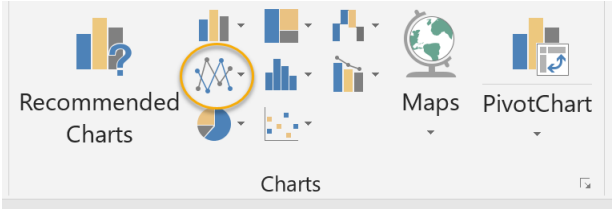
   C. Select the **3-D Pie** chart by clicking it:

2. To insert a line chart in **Sheet2**:

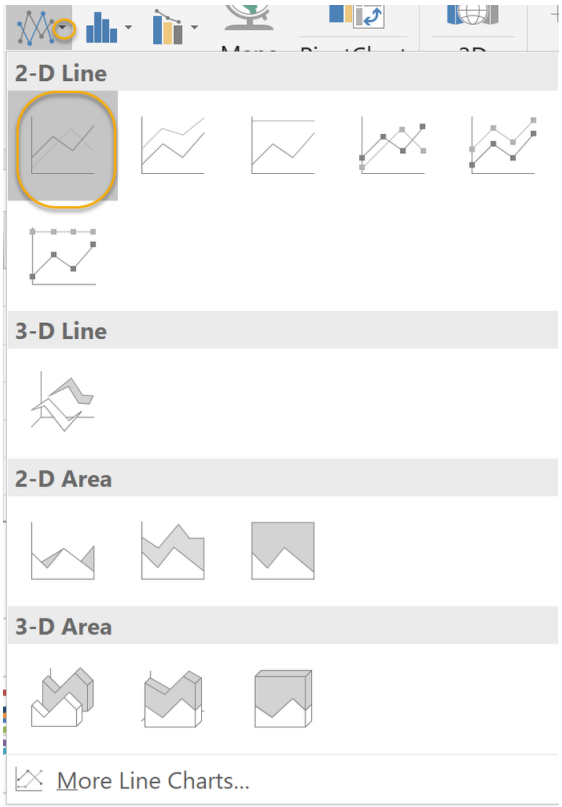
   A. Select cells **A1:H8** or select any cell in the range.

   B. On the **Insert** tab, in the **Charts** group, click the **Insert Line or Area Chart** command:

EVALUATION COPY: Not to be used in class.



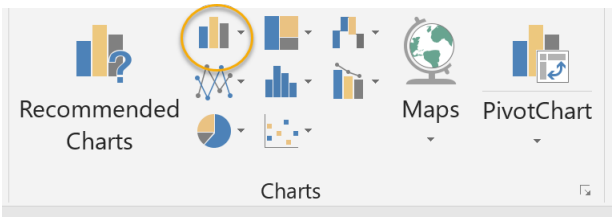
C. Select the **Line** chart by clicking it:



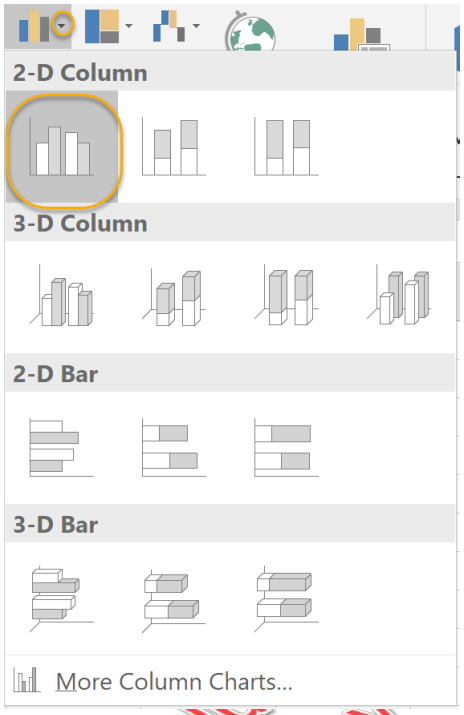
3. To insert a column chart in **Sheet3**:

   A. Select cells **A1:E8** or select any cell in the range.

   B. On the **Insert** tab, in the **Charts** group, click the **Insert Column or Bar Chart** command:



C. Select the **Clustered Column** chart by clicking it:



Evaluation Copy

4.4. Editing Charts

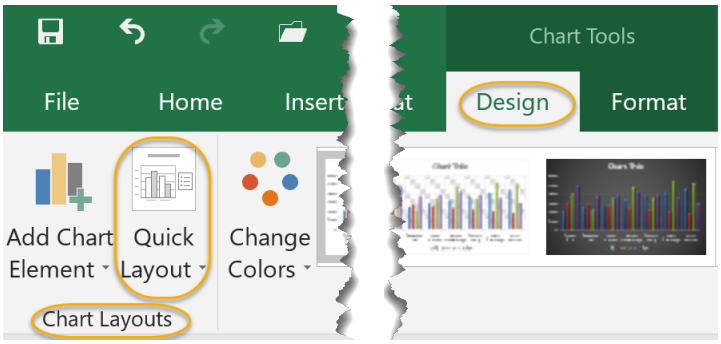
When you select a chart in Excel, two **Chart Tools** tabs appear:

1. **Design**. Use the **Chart Tools Design** tab to select or change data, change the layout of the chart, or change the style of the chart.
2. **Format**. Use the **Chart Tools Format** tab to change the shape styles, chart fill colors, and text formatting in the chart.

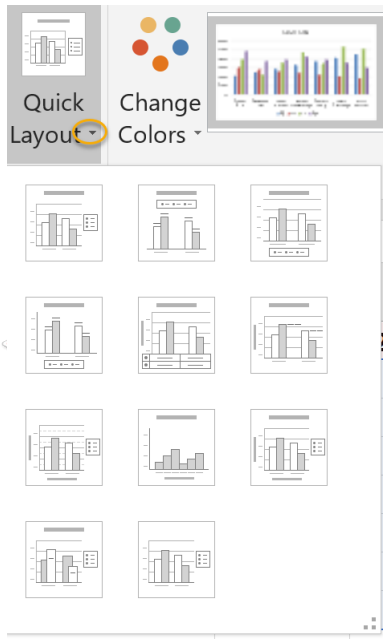
❖ 4.4.1. Changing the Layout of a Chart

1. Select the chart by clicking it.
2. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Quick Layout** to see all the layouts available:

EVALUATION COPY: Not to be used in class.



3. Select an alternative layout by clicking it. The following image shows the layout options for bar charts. The same options are available for other chart types, though they obviously look a little different:



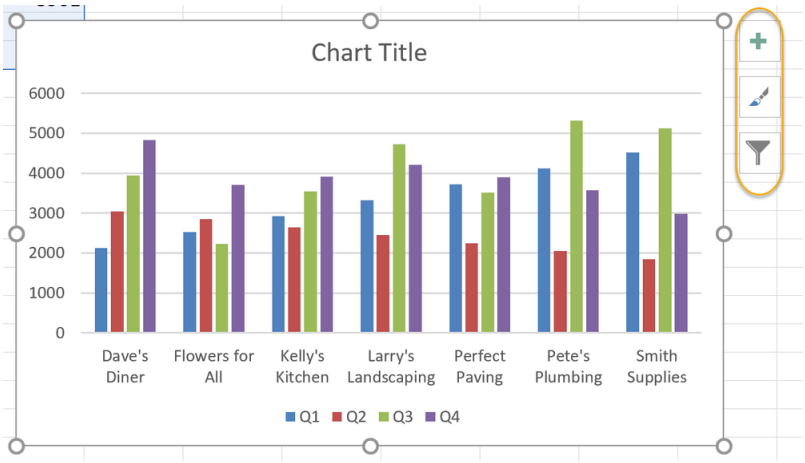
4.5. Using Chart Tools

Charts are easy to format and work with using three chart buttons that appear when you select the chart.

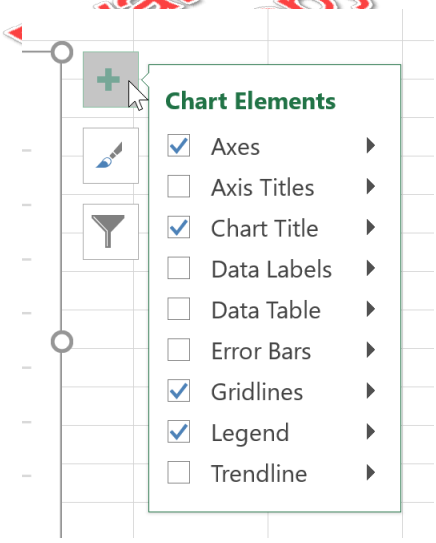
To use the chart tools:

1. Click the chart you want to work with.

2. Notice the three buttons that appear next to the chart.

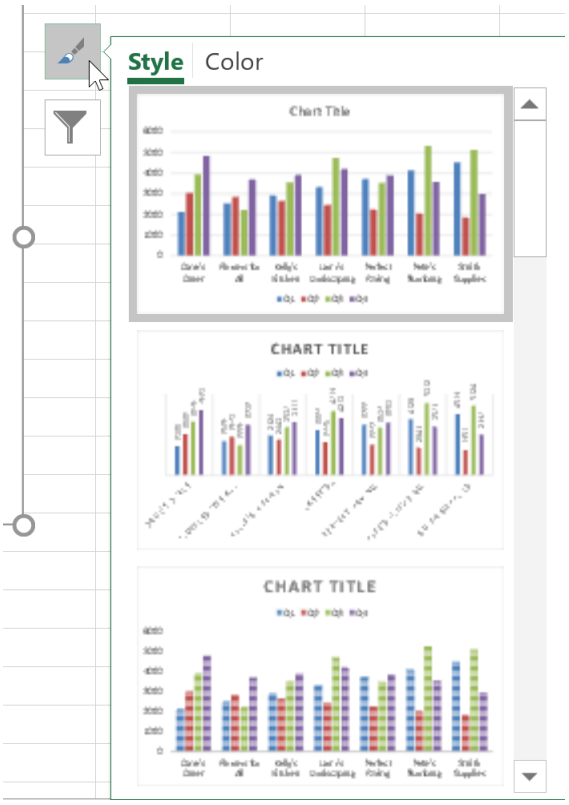


3. Use the **Chart Elements** button to quickly work with the legend, data labels, axis titles, and more.

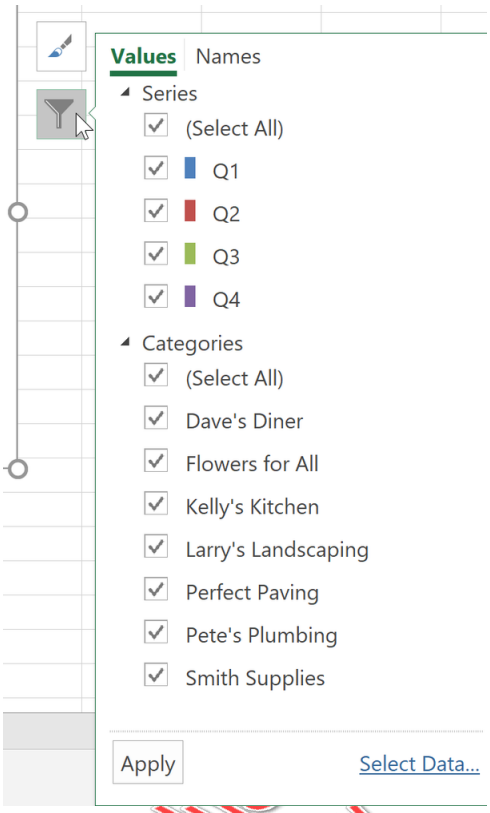


4. Use the **Chart Styles** button to change the style and color of your chart.

EVALUATION COPY: Not to be used in class.



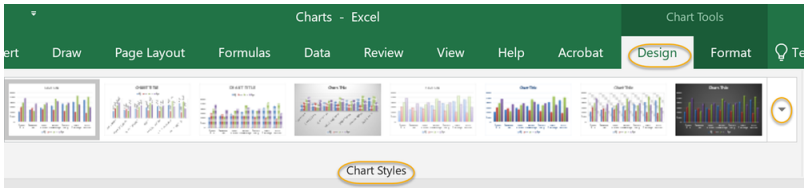
5. Use the **Chart Filters** button to change which data points and names appear in your chart.



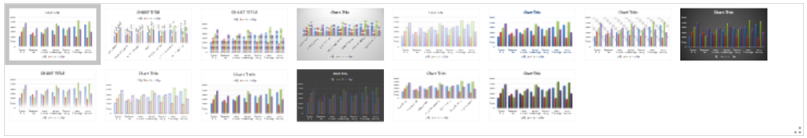
Evaluation Copy

❖ 4.5.1. Changing the Style of a Chart

1. Select the chart by clicking it.
2. On the **Chart Tools Design** tab, in the **Chart Styles** group, click the **More** button to see all the styles available:



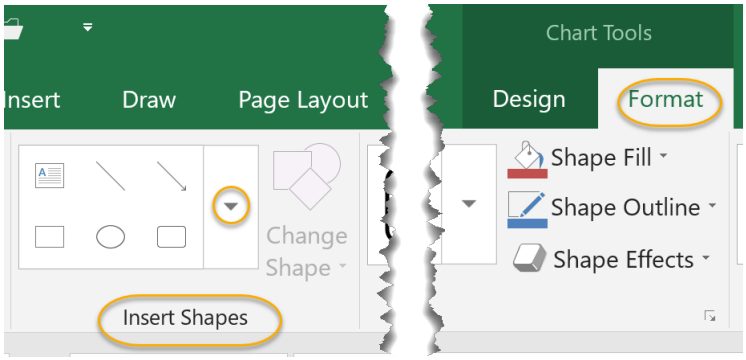
3. Select an alternative style by clicking it. The following image shows the style options available for bar charts:



EVALUATION COPY: Not to be used in class.

❖ 4.5.2. Adding a Shape to a Chart

1. Select the chart by clicking it.
2. On the **Chart Tools Format** tab, in the **Insert Shapes** group, click the **More**.



3. Navigate to and select a shape by clicking it.
4. Your cursor will change to a plus sign. Click in your chart where you want to place the shape, drag your mouse until the shape is the size you want it to be, and then release your mouse.

❖ 4.5.3. Adding a Trendline to a Chart

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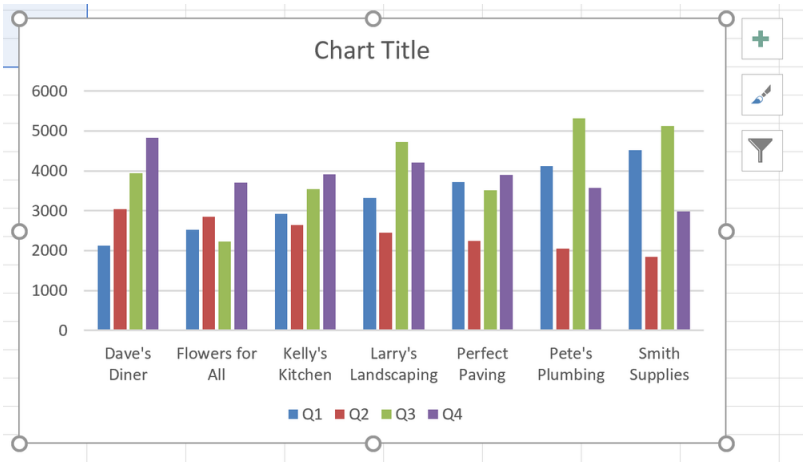
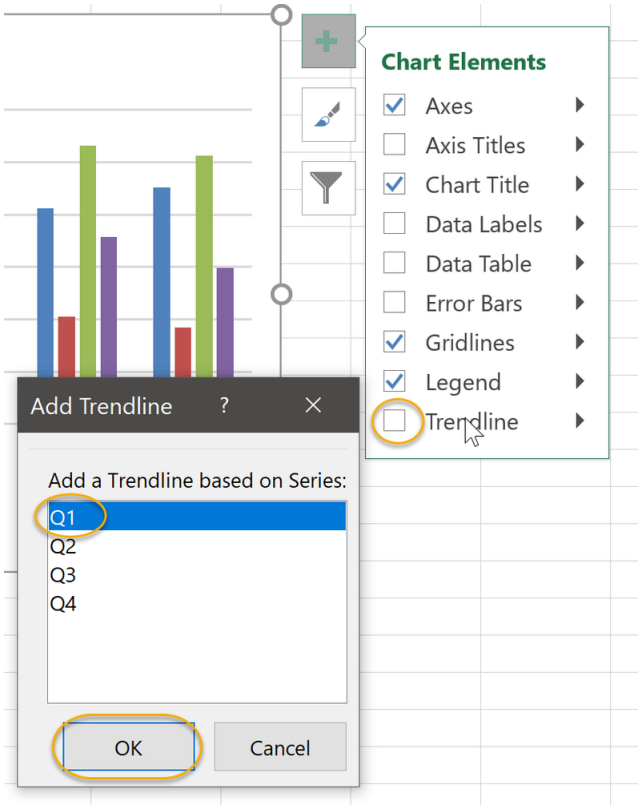
A visual way to show trends in charts is to add trendlines.

To add a trendline to a chart:

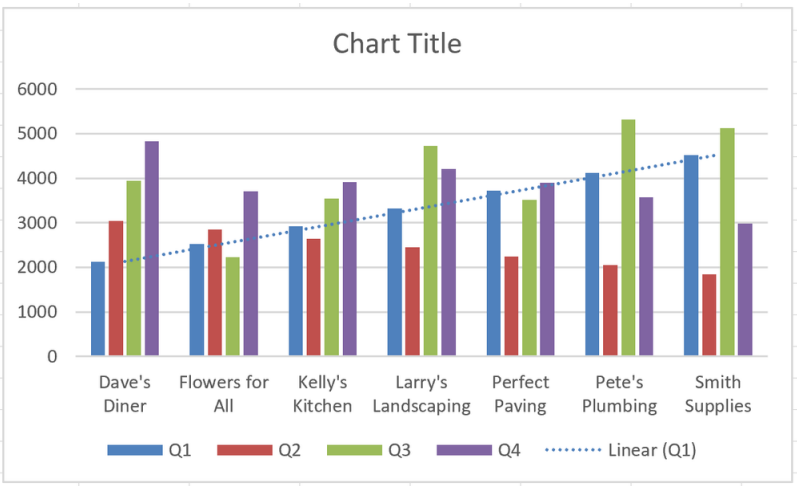
1. In the chart, select the data series to which you want to add the trendline.
2. Select the **Chart Elements** option that appears next to the chart.



3. Check the **Trendline** check box. Click the arrow next to **Trendline** to change trendline options.



4. Your chart may look like this:



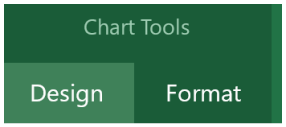
EVALUATION COPY: Not to be used in class.

❖ 4.5.4. Adding a Secondary Axis to a Chart

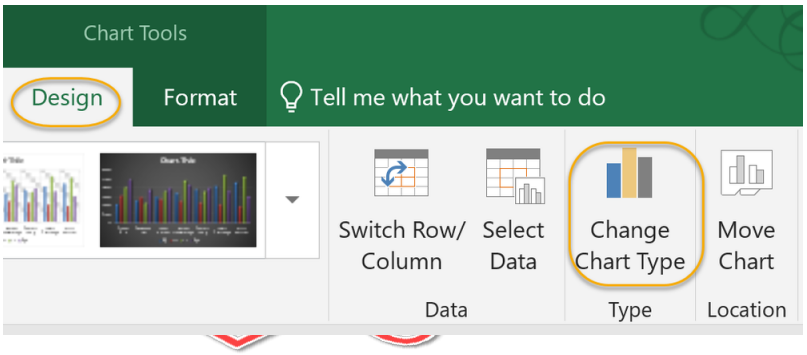
You can create a chart with dual axes; that is, add a secondary vertical axis to a chart. This is useful when you have two different types of data you want to display.

To add a secondary axis to a chart:

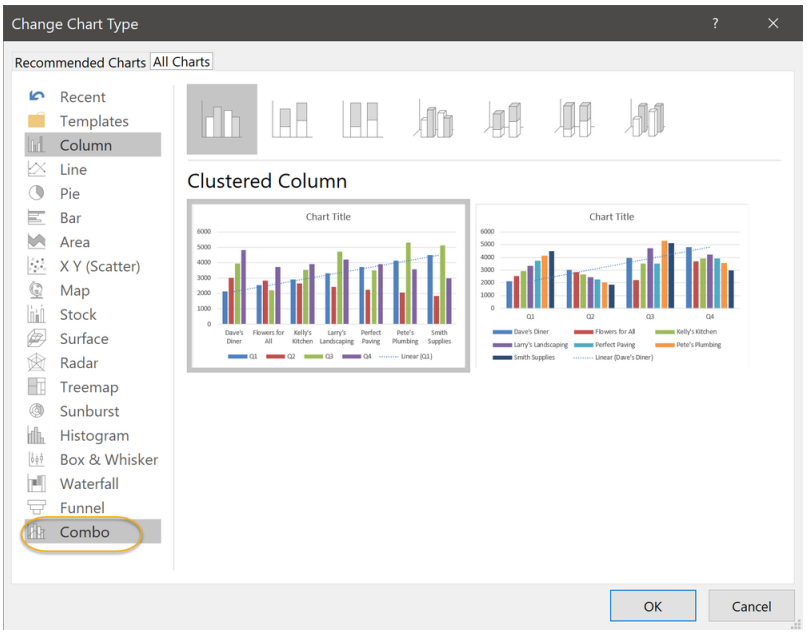
1. Click in the chart to display the **Chart Tools Design** tab.



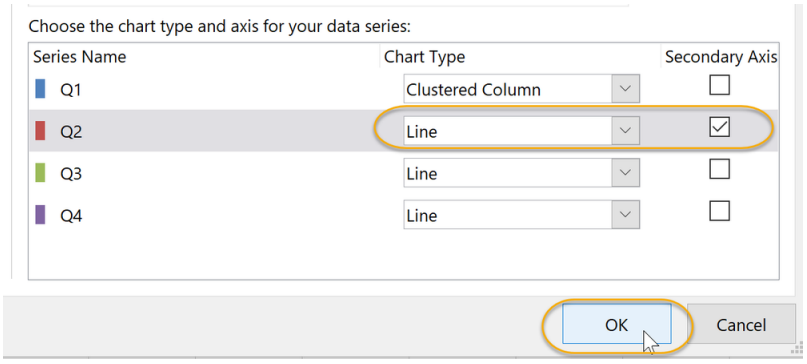
2. Select the **Design** tab, and then from the **Type** group, select **Change Chart Type**.



3. On the left, select **Combo**.

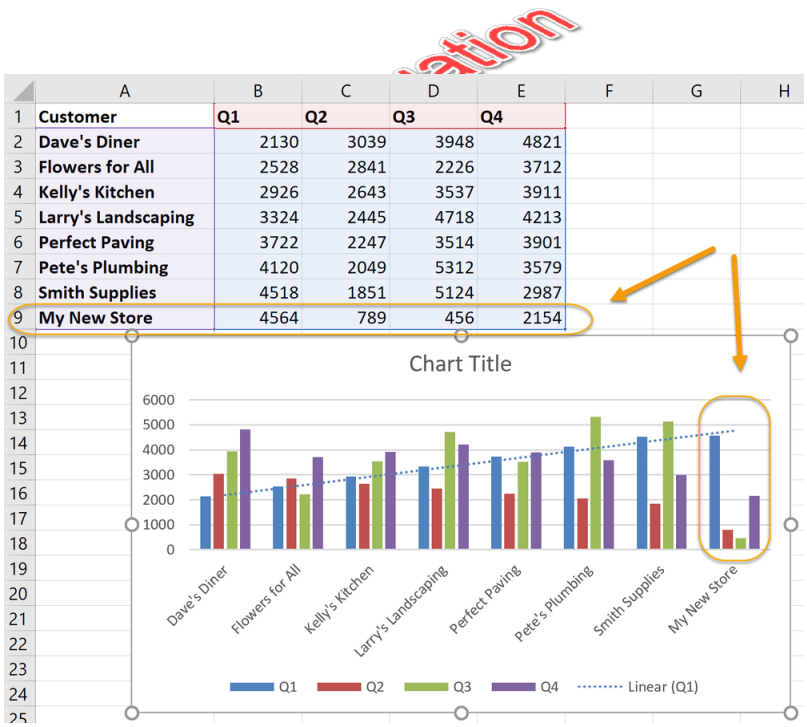


4. Under **Choose the chart type and axis for your data series**, check the check box for the data you want to plot on the secondary axis, and then select **Line** for the **Chart Type**. All other data should be **Clustered Column**. Click **OK**.



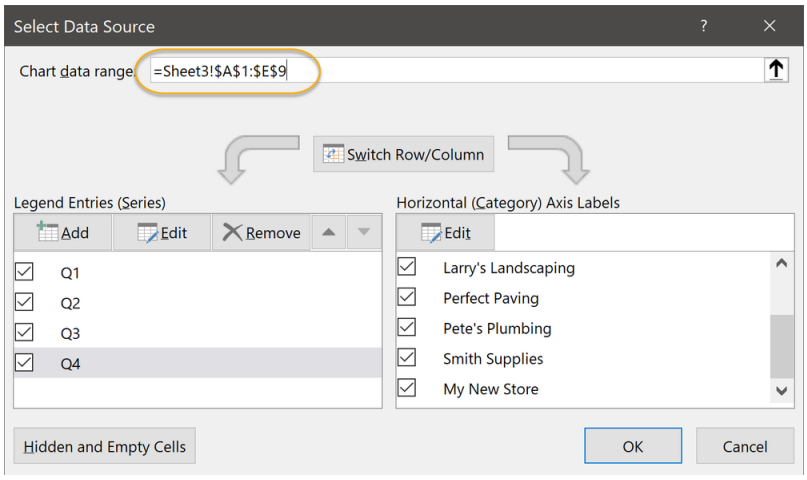
❖ 4.5.5. Adding Additional Data Series to a Chart

Add the data to the cells that you selected for the chart, and the chart automatically updates with the new data series.



You can also use the **Chart Tools Design** tab. In the **Data** group, select **Select Data** and then use the options in the **Select Data Source** dialog box to select the new series.

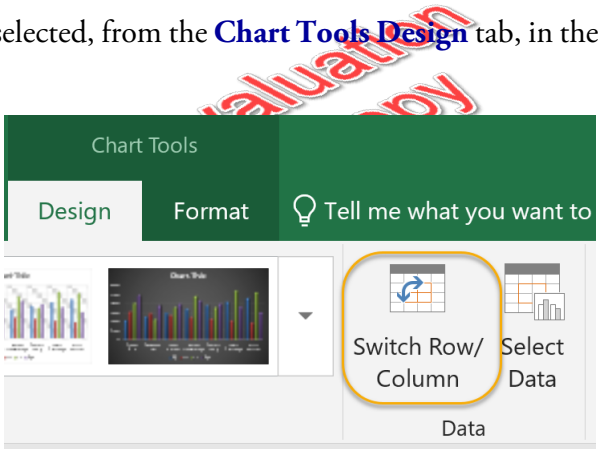
EVALUATION COPY: Not to be used in class.



❖ 4.5.6. Switch between Rows and Columns in a Chart

To switch between rows and columns in a chart, follow these steps:

1. With your chart selected, from the **Chart Tools Design** tab, in the **Data** group, select **Switch Row/Column**.



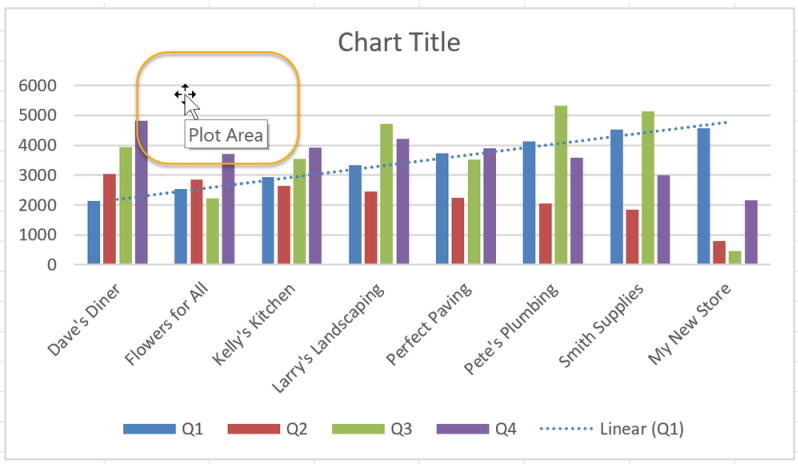
2. The row/column display in the chart will change. To revert back, select this option again.

❖ 4.5.7. Positioning a Chart

Once the chart is inserted, it is easy to change its position.

To change the position of a chart:

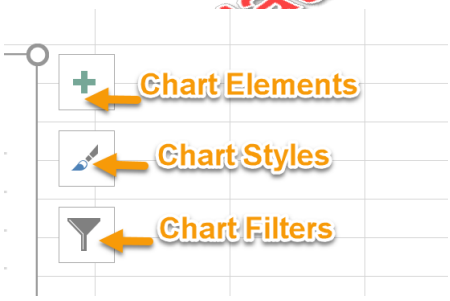
1. Hover your cursor over the chart until it turns into a four-headed arrow.



2. Click and drag the chart to the appropriate position.

❖ 4.5.8. Modifying Chart and Graph Parameters

To make changes to your chart, use the **Chart Elements**, **Chart Styles**, and **Chart Filters** options. To access these options, click the chart. They will appear next to the chart:



Some of the things you can use **Chart Elements** to do include:

1. Add or remove gridlines.
2. Add or remove titles.
3. Display table data.
4. Add error bars.

Some of the things you can use **Chart Styles** to do include:

1. Change the color of the chart.
2. Change the style of the chart.

EVALUATION COPY: Not to be used in class.

Some of the things you can use **Chart Filters** to do include:

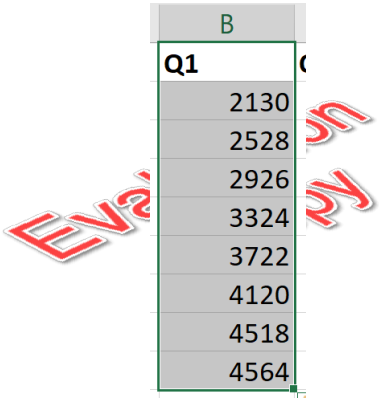
1. Filter your data by categories.
2. Filter your data by series.

4.6. Using the Quick Analysis Tool

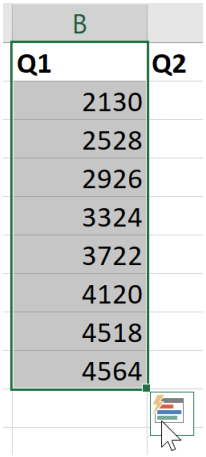
The Quick Analysis tool is a feature that allows you to convert your data quickly and easily into a chart or table.

To use the Quick Analysis tool:

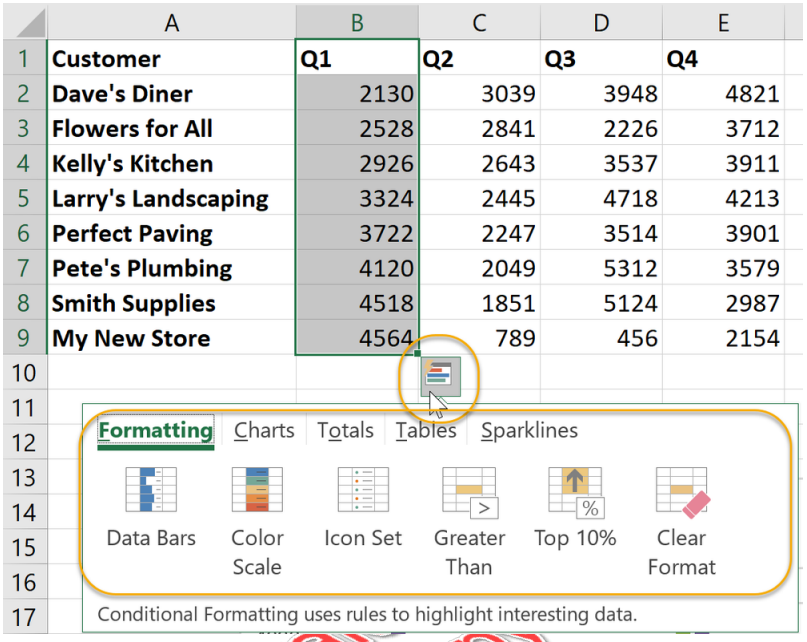
1. Select the cells of data that you want to analyze.



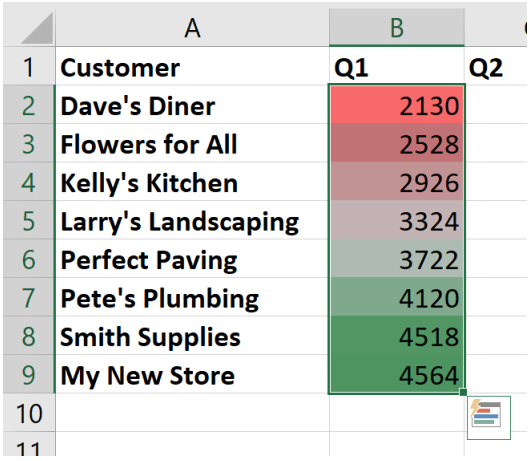
2. Notice the **Quick Analysis Tool** icon that is displayed at the bottom of the data. Click it.



3. Roll over each option in the Quick Analysis gallery to see a preview.



4. To select an option, click it.

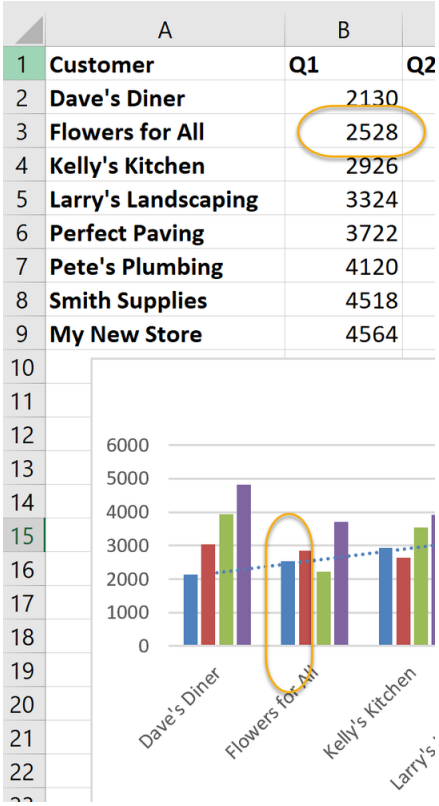


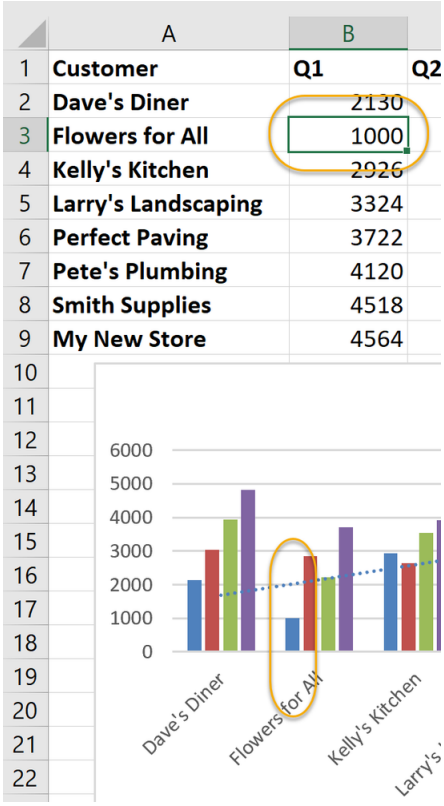
EVALUATION COPY: Not to be used in class.

4.7. Working with Charts

❖ 4.7.1. Watching Animation in a Chart

Once you have added a chart, if you change the source data for that chart, you can watch the chart automatically update. Below is a pie chart reflecting original data, and then source data that has changed.

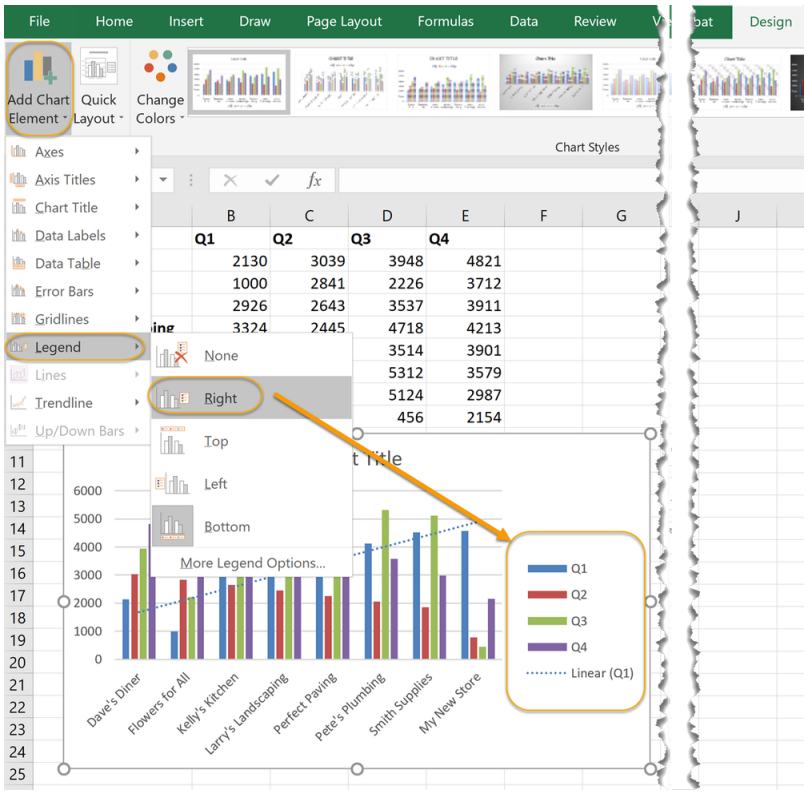




❖ 4.7.2. Showing, Hiding, or Changing the Location of the Legend in a Chart

1. Select the chart by clicking it.
2. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Add Chart Element** and select **Legend**. Select one of the legend options by clicking it:

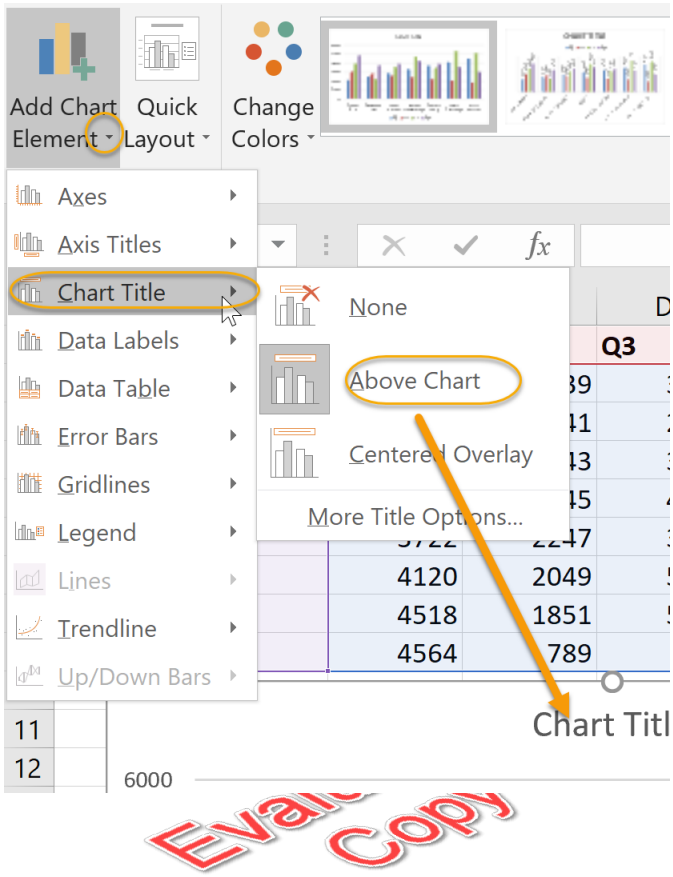
EVALUATION COPY: Not to be used in class.



❖ 4.7.3. Showing or Hiding the Title of a Chart

To show or hide the title of a chart, follow these steps:

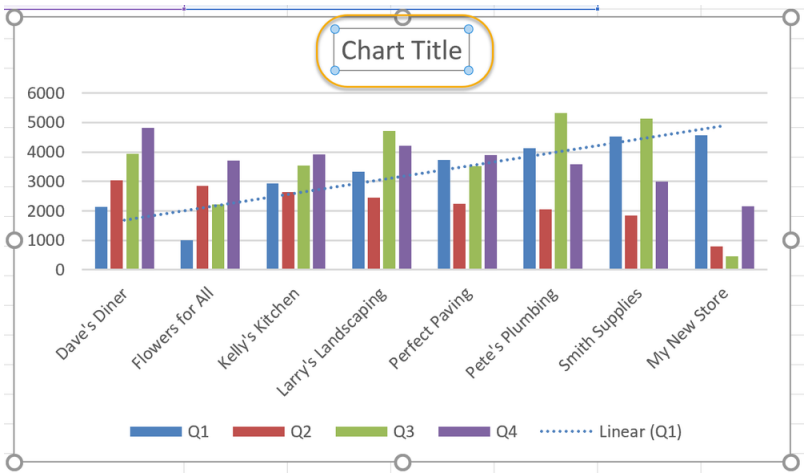
1. Select the chart by clicking it.
2. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Add Chart Element** and select **Chart Title**. Select **None** if you do not wish to display the title, or one of the other options if you do wish to display it:



❖ 4.7.4. Changing the Title of a Chart

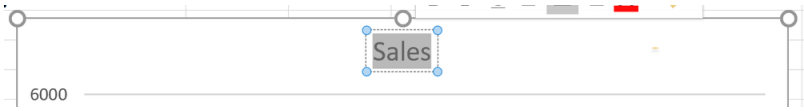
To change the title of a chart:

1. Select the title by clicking it within the chart:



EVALUATION COPY: Not to be used in class.

2. Double-click the title to select the title text:

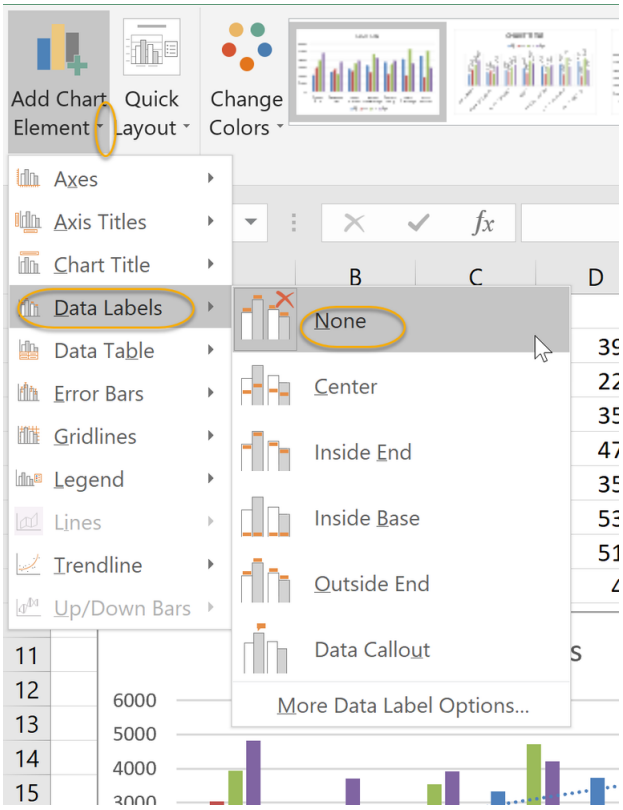


3. Type in the new title for your chart.

❖ 4.7.5. Showing, Hiding, or Changing the Location of Data Labels in a Chart

To show, hide, or change the location of data labels in a chart, follow these steps:

1. Select the chart by clicking it.
2. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Add Chart Element** and select **Data Labels**. Select **None** if you do not wish to display data labels, or one of the other options if you do wish to display them. Note that the options change based on the chart type.

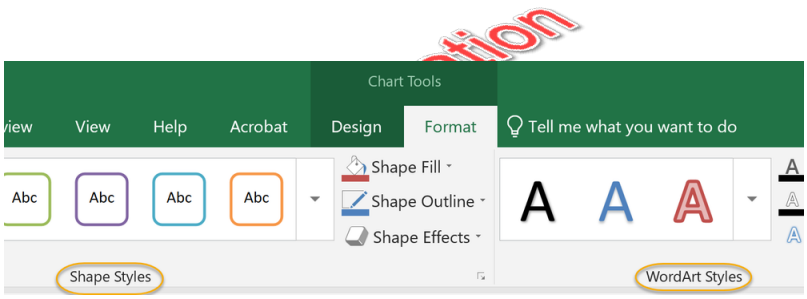


3. If you aren't sure which to choose, just select each one individually to see what it looks like until you find something you like.

❖ 4.7.6. Changing the Style of Pieces of a Chart

To change the style of pieces of a chart:

1. Select any piece of the chart (chart image itself, title, legend, data labels, etc.).
2. On the **Chart Tools Format** tab, in the **Shape Styles** group or **WordArt Styles** group, move your mouse over the styles available to see what your chart will look like if you select that style:



3. As desired, click the drop-down arrows to see and mouse over the many style options available.
4. Select a style by clicking it.

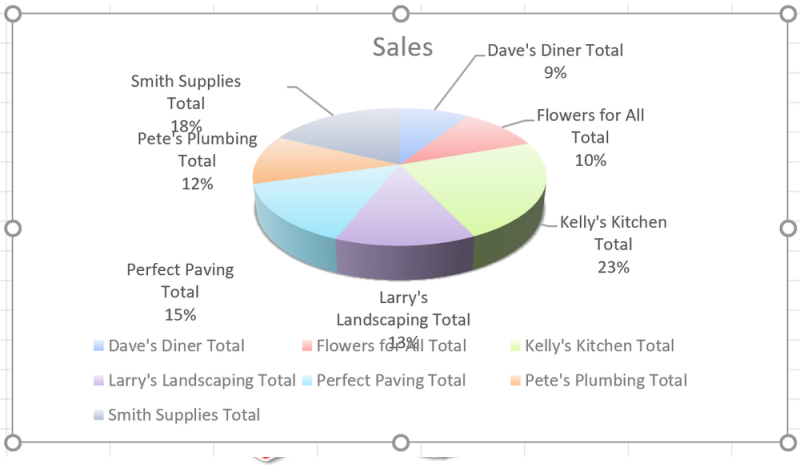
EVALUATION COPY: Not to be used in class.

Exercise 18: Editing Charts

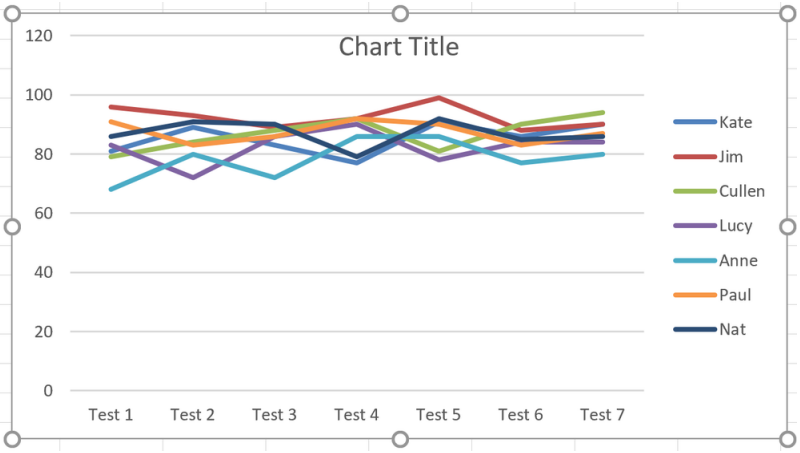
15 to 25 minutes

In this exercise, you will edit the charts you inserted in the last exercise.

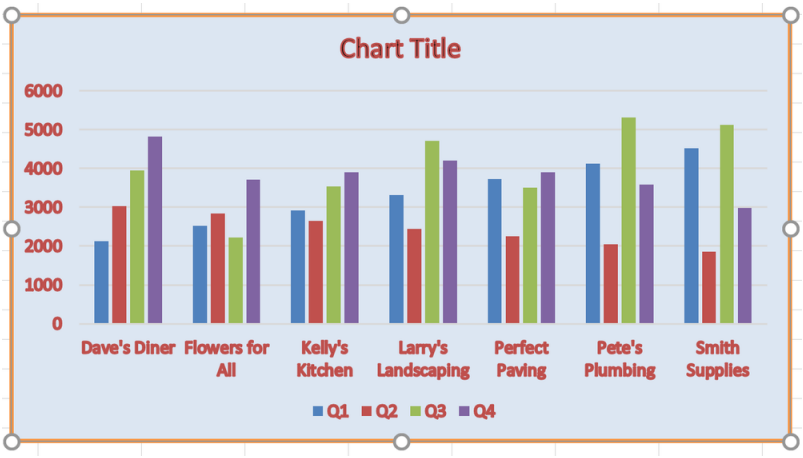
1. Open `Editing Charts.xlsx` from your `Excel2019.2/Exercises` folder.
2. On **Sheet1**, change the layout and style of the chart so that it looks like the image below. Each section of the pie should be pastel:



3. On **Sheet2**, move the legend, move the title, and add a title to the chart ("Grades by Student") as shown in the image below:



4. On **Sheet3**, add styles to the chart such that it has an orange outline, blue fill, and all text is outlined in red:



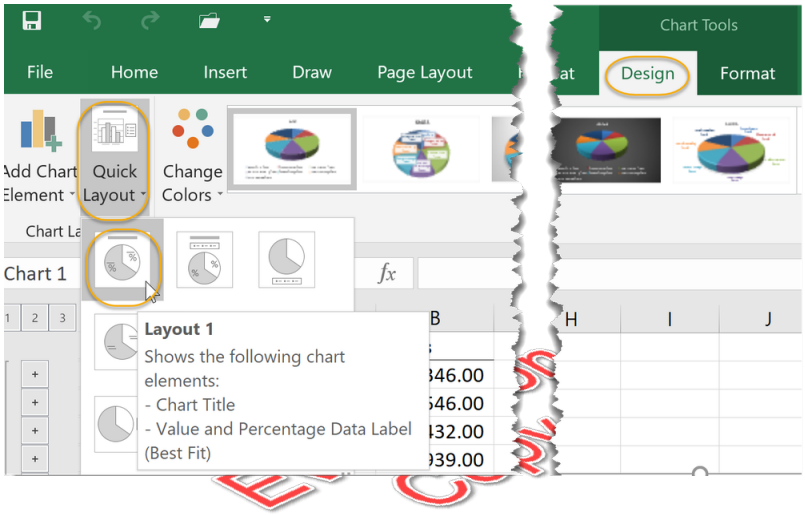
EVALUATION COPY: Not to be used in class.

Solution

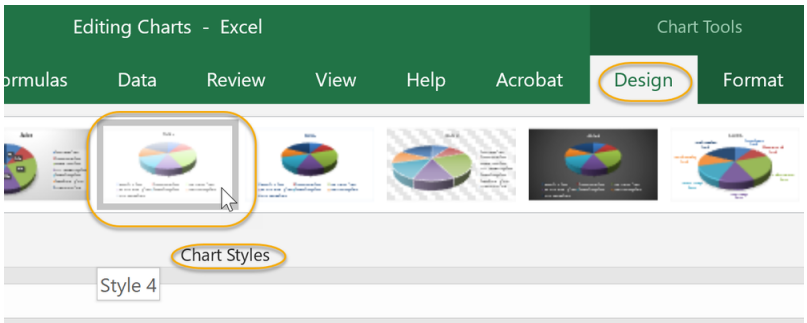
1. On **Sheet1**, change the layout and style of the chart:

   A. Select the chart by clicking it.

   B. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Quick Layout** and select **Layout 1**:



   C. On the **Chart Tools Design** tab, in the **Styles** group, click **Style 4**:

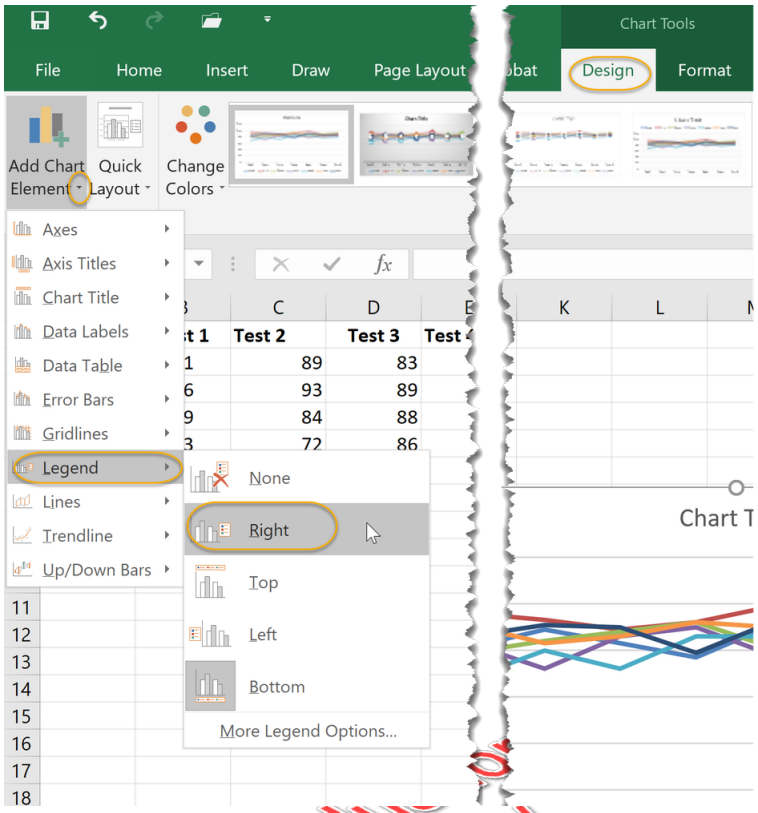


2. On **Sheet2**, move the legend and the title and change the title of the chart:

   A. Select the chart by clicking it.

   B. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Add Chart Element** and select **Legend** and select **Right**.

EVALUATION COPY: Not to be used in class.



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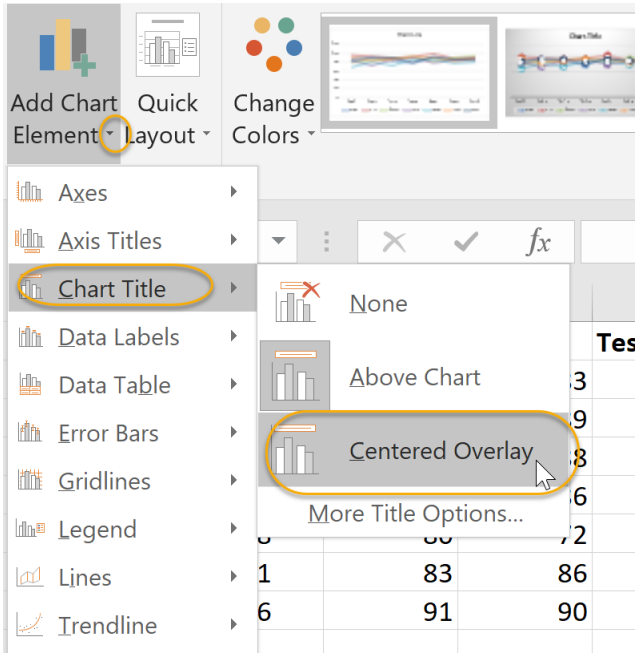
C. On the **Chart Tools Design** tab, in the **Chart Layouts** group, click **Add Chart Element** and select **Chart Title** and then select **Centered Overlay**.

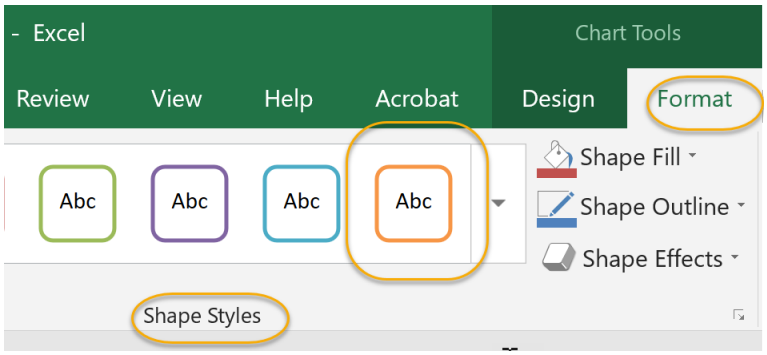


D. Click in the **Chart Title** box, select the text, and type "Grades by Student".

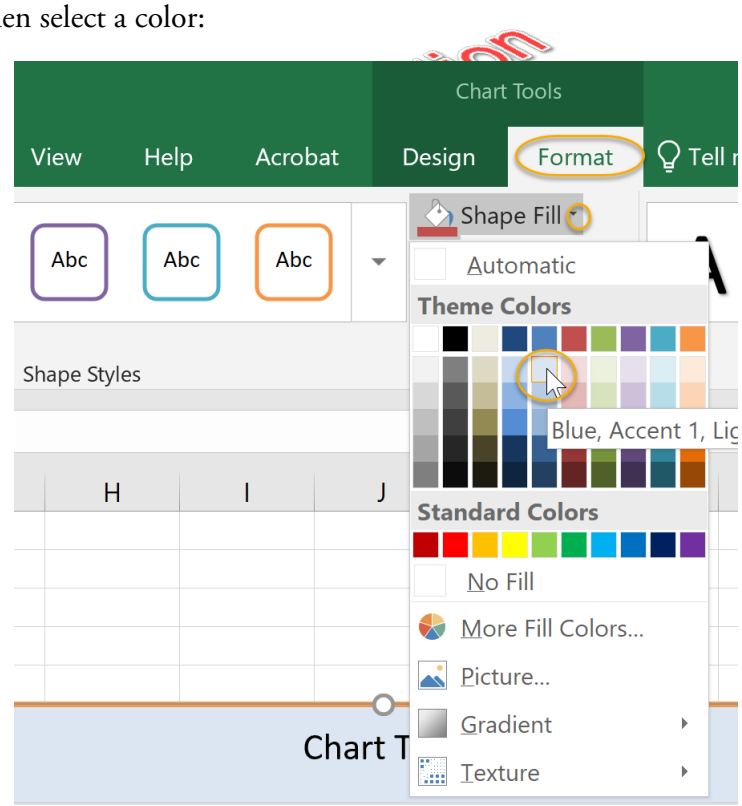
3. On **Sheet3**, add styles to the chart so that it looks like the image shown:

   A. Select the chart by clicking it.

   B. On the **Chart Tools Format** tab, in the **Shape Styles** group, click the orange **Colored Outline** (you may have to click the **More** button to see the orange outline):

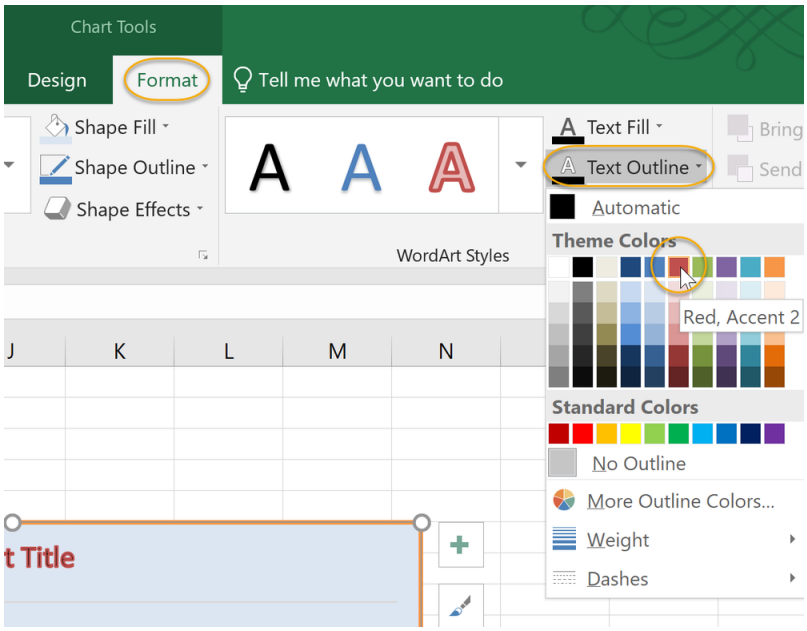


   C. On the **Chart Tools Format** tab, in the **Shape Styles** group, click **Shape Fill** and then select a color:



   D. On the **Chart Tools Format** tab, in the **WordArt Styles** group, click **Text Outline** and then select **Red**:

EVALUATION COPY: Not to be used in class.



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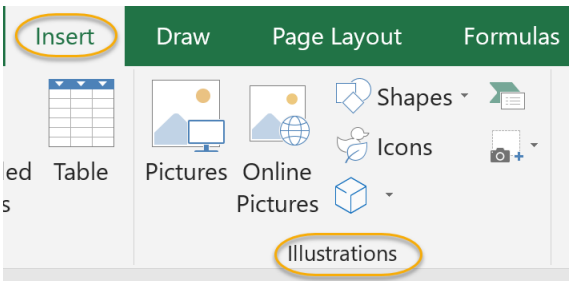
4.8. Add and Format Objects

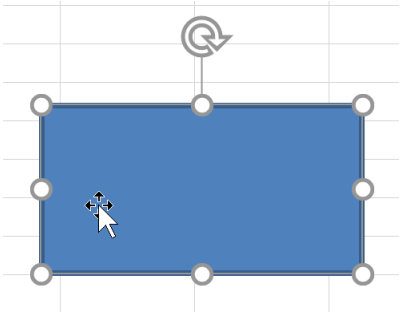
You can add objects to your worksheets, such as pictures, ClipArt, shapes, and screenshots.

To add an object to your worksheet:

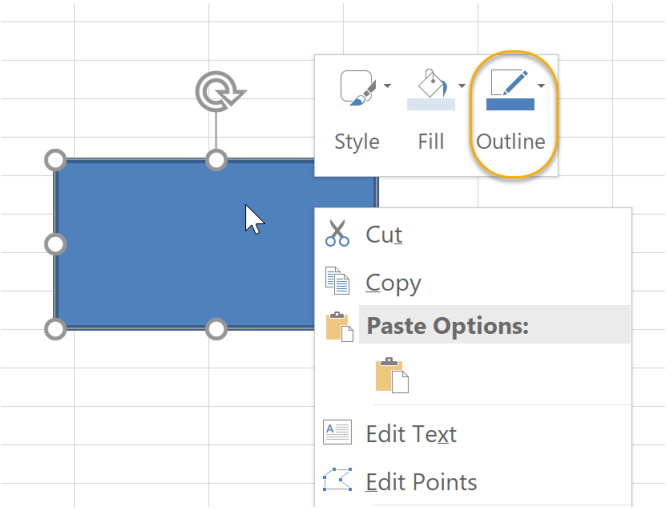
1. From the **Insert** tab, in the **Illustrations** group, select an option to add an object.



2. You can change the position of the inserted object by clicking and dragging it within the worksheet. First hover your cursor over it until it becomes a four-headed arrow.

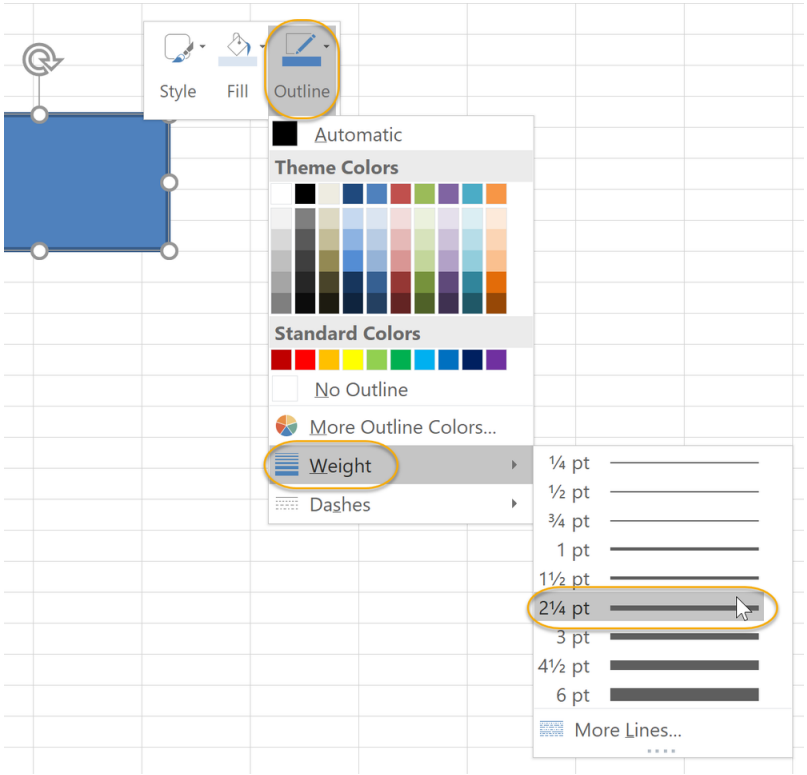


3. You can add a border to your object by right-clicking the object and selecting **Outline**.



4. Use the options in the drop-down list to add a border.

EVALUATION COPY: Not to be used in class.

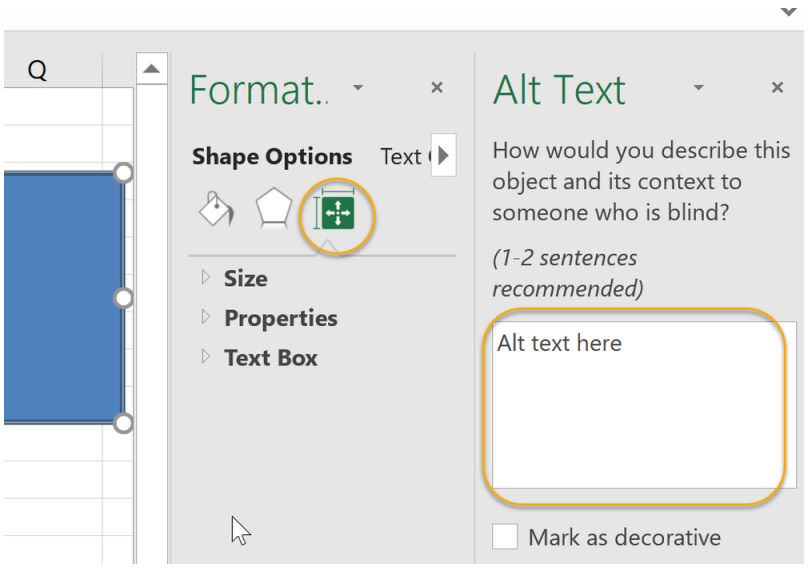


Add Alternative Text to Objects

You can add alternative text, called alt text, to objects you insert in Excel, to allow screen readers to be able to identify them.

To add alt text to an object:

1. Right-click the object, and select the **Format** option. For example, for a shape, select **Format Shape**.
2. Select **Size Properties**, and select **Alt Text**. Note you may need to Right-click and choose Edit Alt Text on some types of artwork. Enter a title, if desired, and enter a description.



❖ 4.8.1. Insert a Text Box

You can insert a text box in a worksheet.

To insert a text box:

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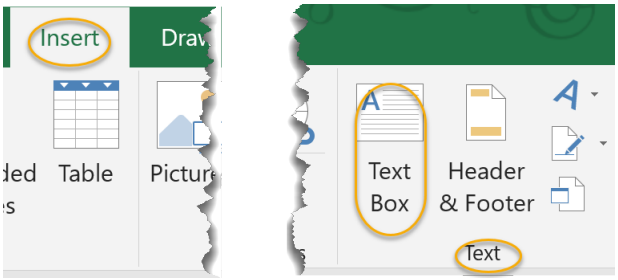
1. On the **Insert** tab, in the **Text** group, select **Text Box**.



2. Your cursor will change to look like an upside-down cross. Click and drag to insert the text box where you want it in your worksheet.
3. Now you can type within the text box.

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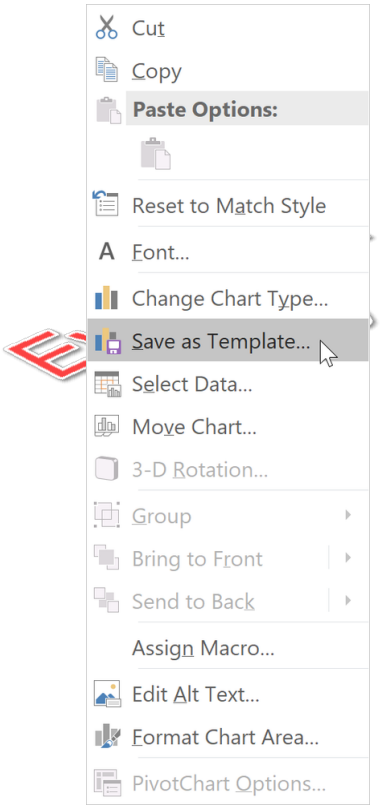
4.9. Create a Custom Chart Template

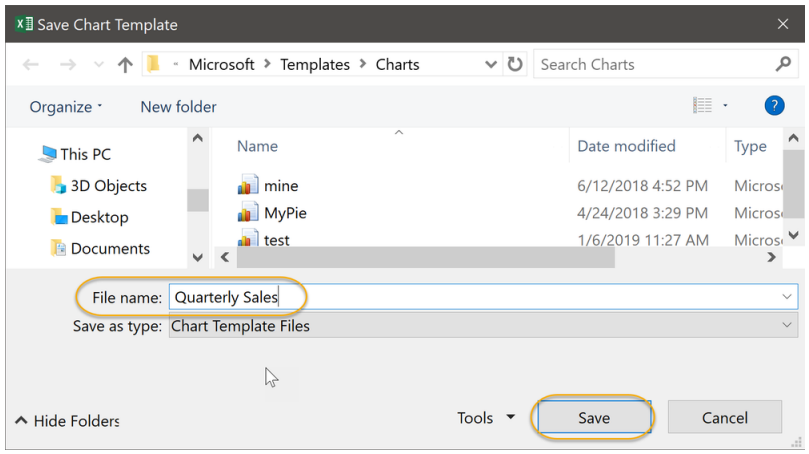
If you have a chart you would like to reuse in the future, you can save it as a custom chart template.

To save a chart as a custom template:

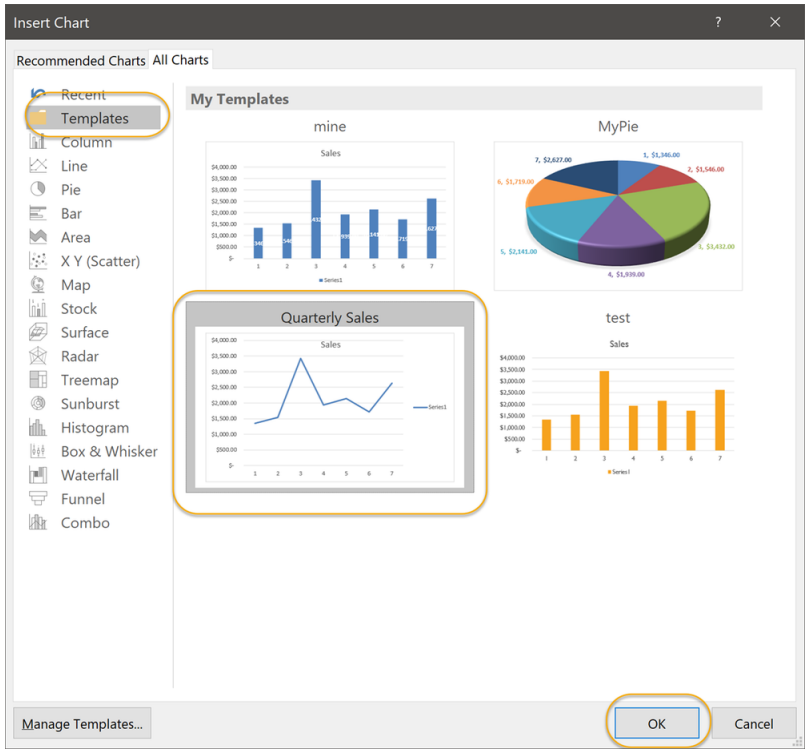
1. Right-click the chart and select **Save as Template**.



2. In the **Save Chart Template** dialog box, select a name for the template and click **Save**.



3. The chart now appears as an option in the **Templates** section when you are inserting a chart.



Conclusion

In this lesson, you learned:

- To create charts that enable you to visualize your data.
- To choose what data is displayed in your charts.

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- To show and hide data labels.
- To show and hide the legend.
- To show and hide the chart title.
- To add a picture or shape to a chart.
- To use styles in charts.
- Add and format objects in a worksheet.
- Create a custom chart template.

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LESSON 5
Working with Tables

Topics Covered

☑ Formatting data as a table.

☑ Modifying tables.

Introduction

Working with tables in Excel can help you organize your data. In Excel, you can group data together into a table and then manipulate that table.

5.1. Format Data as a Table

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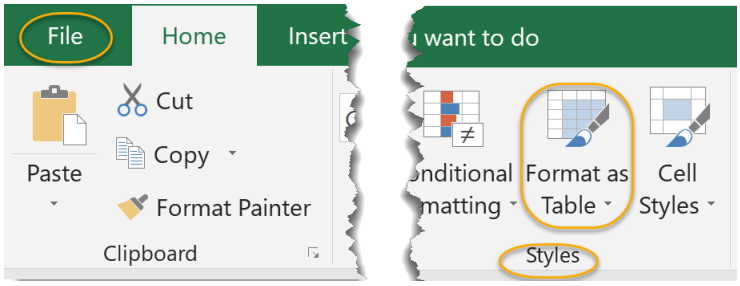
To format data in Excel as a table:

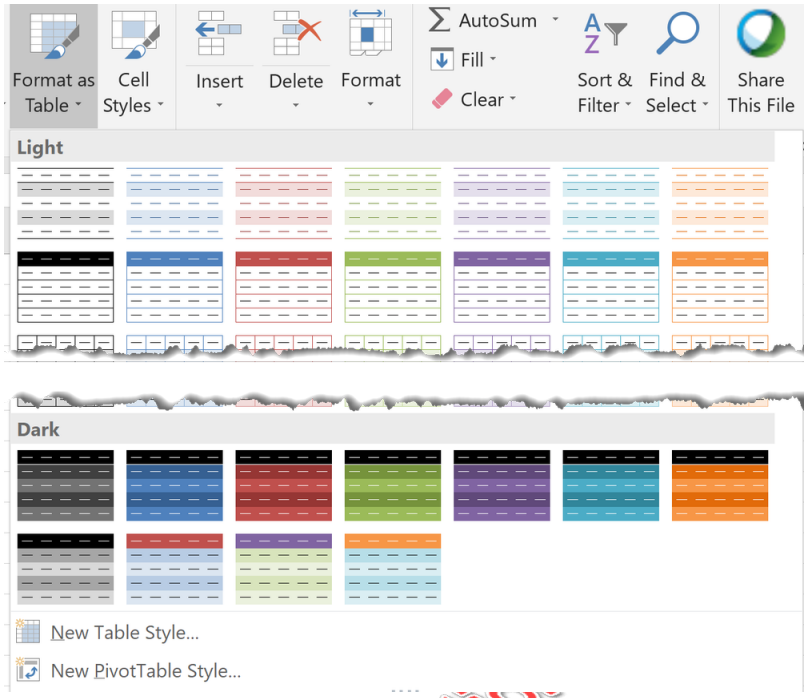
1. Highlight the data that you want to turn into a table.

	A	B	C
1	Student	Score	Grade
2	Kate	75	C
3	Jim	91	A
4	Cullen	85	B

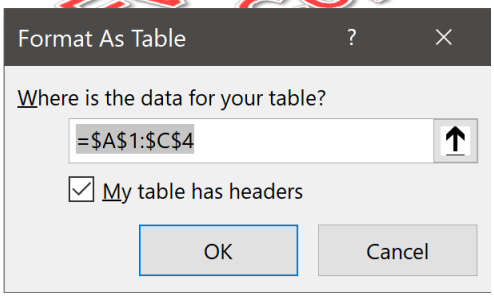
2. From the **Home** tab, in the **Styles** section, click **Format as Table**.



3. From the drop-down list, select a table style to apply.



4. In the **Format As Table** dialog box, click **OK**.



5.2. Move between Tables and Ranges

When working in tables in Excel, you can select cells and cell ranges as you would within a worksheet, by clicking to select a cell and clicking and dragging to select a range.

However, to select rows and columns in a table, you need to click the left edge of the row or the top edge of the column, respectively, when it turns to an arrow.

EVALUATION COPY: Not to be used in class.

	A	B	C
1	Student	Score	Grade
2	Kate	75	C
3	Jim	91	A
4	Cullen	85	B
5			

	A	B	C
1	Student	Score	Grade
2	Kate	75	C
3	Jim	91	A
4	Cullen	85	B
5			

5.3. Modify Tables

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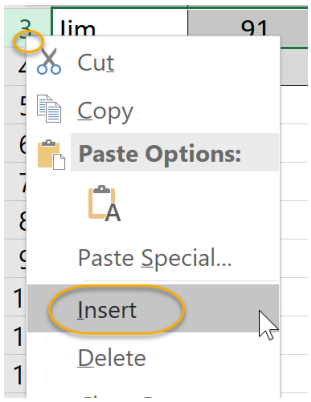
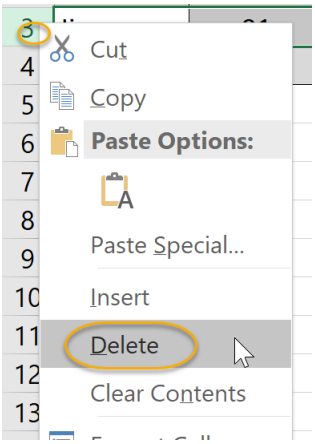
You can modify Excel tables in a number of different ways.

❖ 5.3.1. Add and Remove Cells within a Table

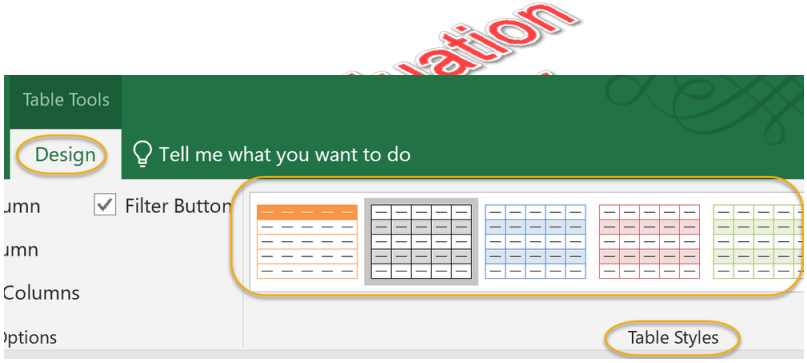
To insert or remove rows or columns of cells within a table, select the row or column to be removed, right-click, and select **Insert** or **Delete**.





❖ 5.3.2. Change Table Styles

To change the style of a table, from the **Table Tools Design** tab, select an option from the **Table Styles** group.

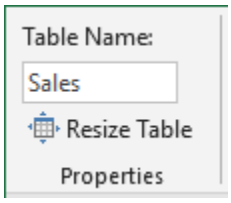


❖ 5.3.3. Name a Table

When you create a table, Excel gives it a default name, such as Table1. You can change the name of the table:

1. Click any cell in the table.
2. Select the **Table Tools Design** tab.
3. In the **Properties** group, click in the **Table Name** field and type a name for the table.

EVALUATION COPY: Not to be used in class.



5.4. Define Titles

When you create a table in Excel, headers are turned into titles by default.

	A	B	C
1	Student	Score	Grade
2	Kate	75	C
3	Jim	91	A
4	Cullen	85	B

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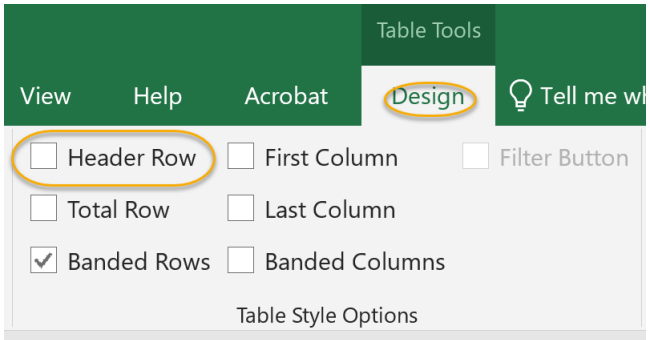
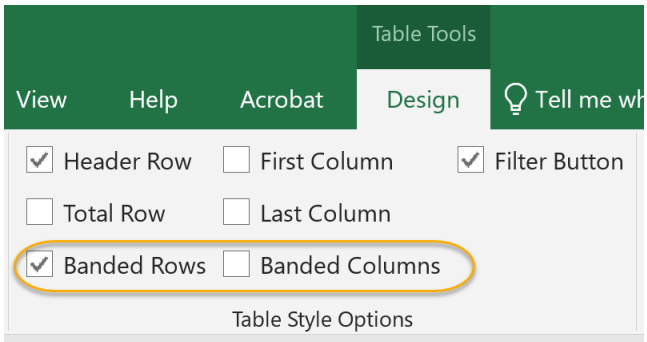
To turn this feature off, from the **Table Tools Design** tab, in the **Table Style Options** group, uncheck the **Header Row** check box.



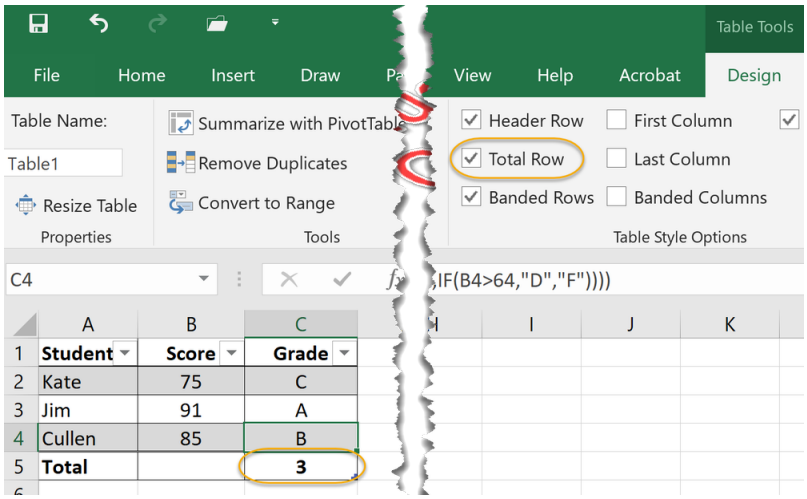
❖ 5.4.1. Band Rows and Columns

You can band rows and columns in an Excel table. To do this, select the **Table Tools Design** tab and in the **Table Style Options** group, check the check boxes to band rows or columns.



❖ 5.4.2. Total Row Option

When you select the **Total Row** checkbox on the **Table Tools Design** tab, Excel adds a row at the end of your table showing the totals of the data in your columns.



❖ 5.4.3. Remove Styles from Tables

You may want to remove styles that you applied to your Excel table.

To remove styles, select the **Table Tools Design** tab and in the **Table Styles** group, select the arrow to view more options, and then select **Clear**.

EVALUATION COPY: Not to be used in class.

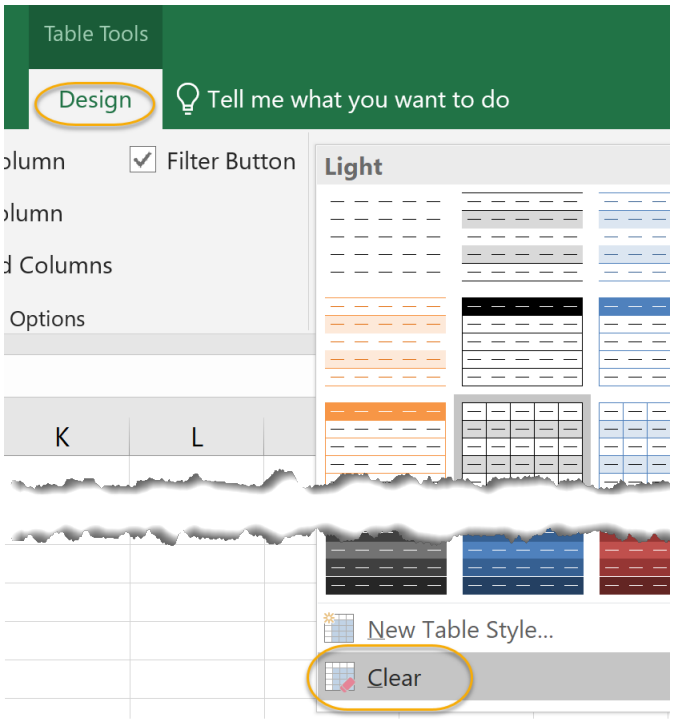


Table Tools
Design
Tell me what you want to do
Filter Button
Options
Light
K
L
New Table Style...
Clear

Exercise 19: Creating and Modifying a Table in Excel

5 to 10 minutes

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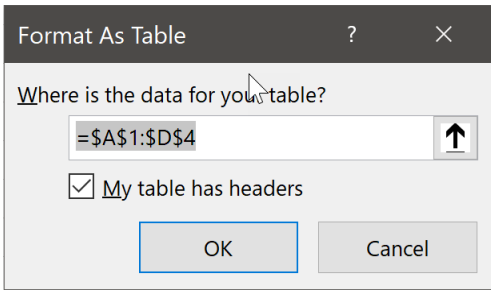
In this exercise, you will create an Excel table and modify it.

1. Open the `Sales - Table.xlsx` file from your `Excel2019.2/Exercises` folder.
2. Create a table that includes the data in all of the cells, using a style of your choice.
3. Now, remove the style that you chose.

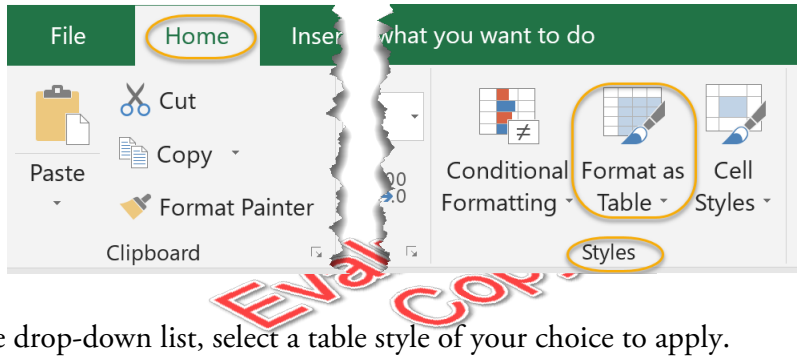
EVALUATION COPY: Not to be used in class.

Solution

1. Select the cell range of the data, so from A1:D4.



2. From the **Home** tab, in the **Styles** section, click **Format as Table**.



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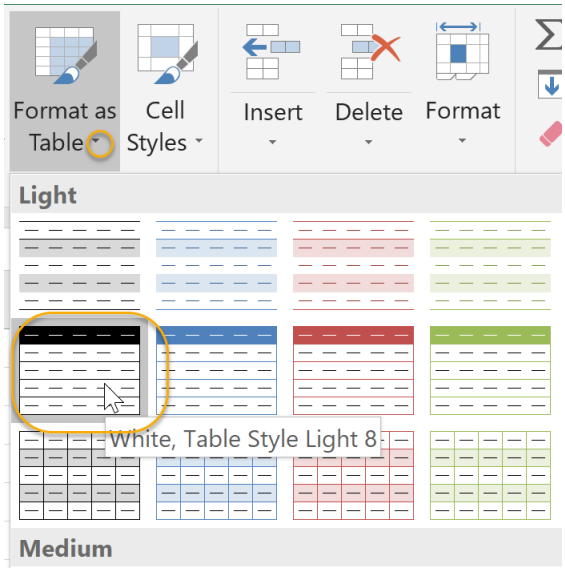
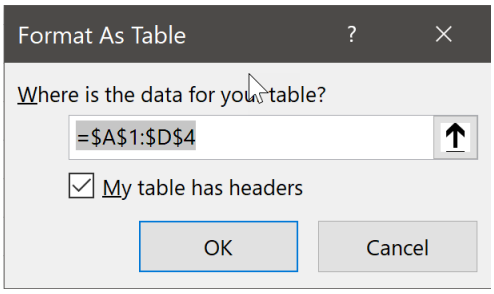
3. From the drop-down list, select a table style of your choice to apply.

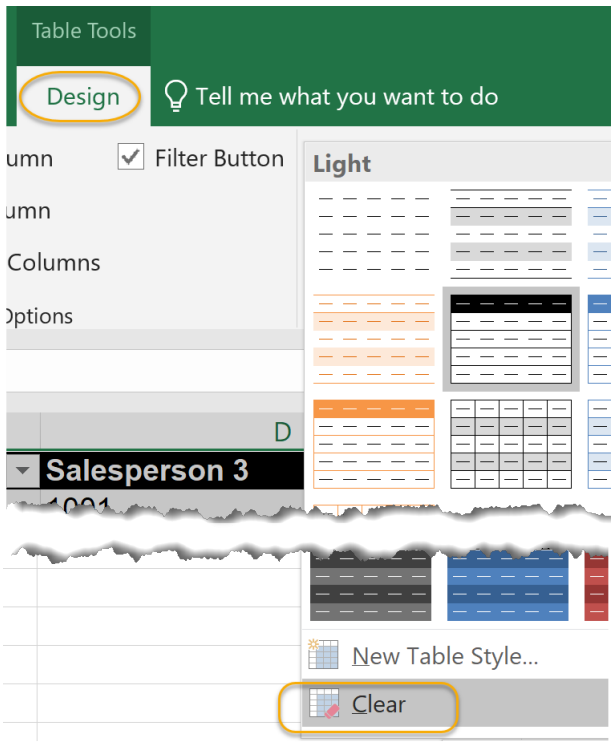


4. In the **Format As Table** dialog box, click **OK**.

EVALUATION COPY: Not to be used in class.



5. Select the **Table Tools Design** tab and in the **Table Styles** group, select the arrow to view more options, and then select **Clear**.



6. Save the workbook.

Conclusion

In this lesson, you have learned:

1. To format data in Excel as a table.
2. To modify Excel tables.

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LESSON 6
Advanced Formatting

Topics Covered

☑ Conditional formatting.

☑ Formatting tables using styles.

☑ Formatting cells using styles.

Introduction

In this lesson, you will learn to use conditional formatting to display cells based on their values, to quickly format tables using styles, and to format cells using styles.

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6.1. Applying Conditional Formatting

Conditional formatting enables you to automatically draw attention to interesting, exciting, concerning, unusual, or other data. Uses of conditional formatting include:

1. Highlighting the highest or lowest numbers in a report.
2. Highlighting numbers above or below a certain number.
3. Highlighting specific values with specific colors.
4. Drawing attention to specific dates.
5. Highlighting cells that contain specific text.
6. Highlighting numbers within a certain range.
7. Visually displaying the values within cells.

Conditional formatting functionality includes:

1. **Highlight Cells Rules**. Highlight numbers greater than, less than, between, or equal to specific numbers. Also highlight cells that include specific text, dates with a specified range, and duplicate values.

2. **Top/Bottom Rules**. Highlight the top or bottom X or X% results in a data set, or numbers that are above or below average.
3. **Data Bars**. Visually display values by filling portions of cells with colors based on the values.
4. **Color Scales**. Visually display values by associating cell colors with the values in the cells.
5. **Icon Sets**. Visually display values using icons.
6. **Formatting Based on Values in Other Cells**. Formatting can be based on the value within the cell itself or on the value within another cell.

To apply conditional formatting:

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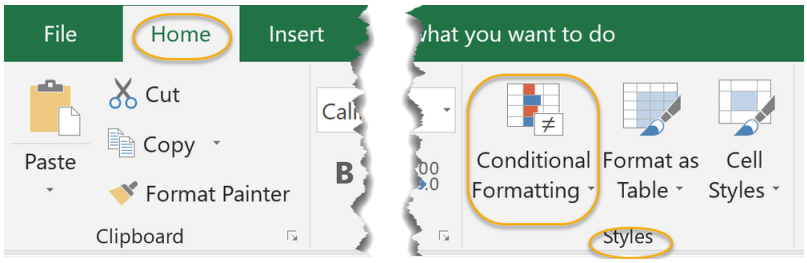
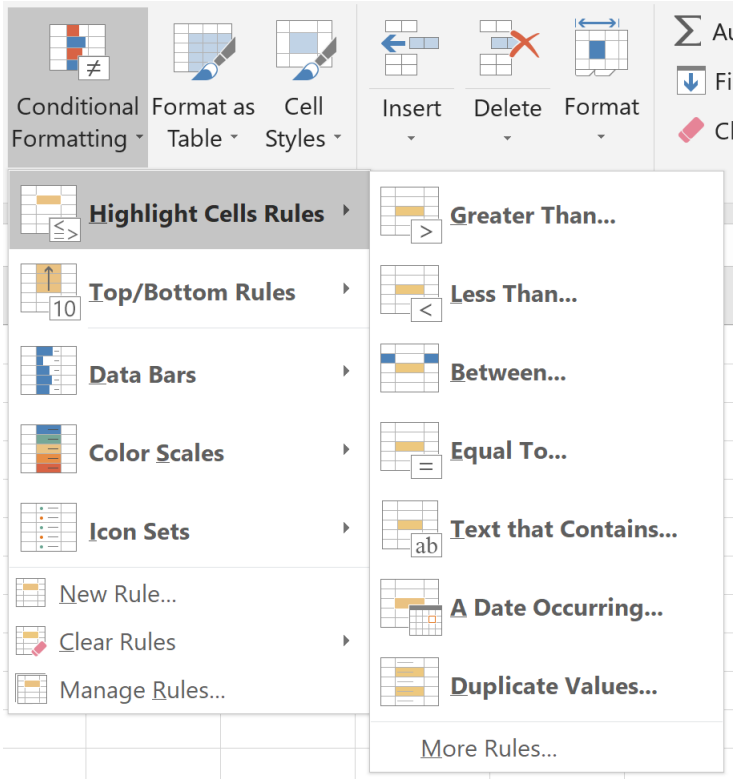
1. Choose the cell or cells to which you wish to apply conditional formatting.
2. On the **Home** tab, in the **Styles** group, click the **Conditional Formatting** command:



3. Select the rule or format you wish to apply by clicking it:

EVALUATION COPY: Not to be used in class.

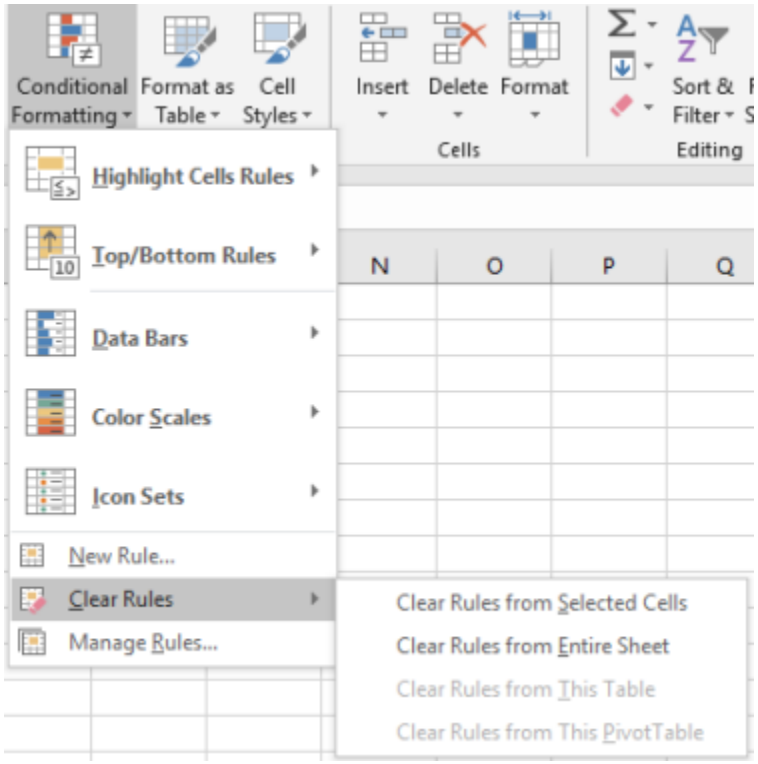


4. If necessary, fill out the requested information in the dialog box that appears.

❖ 6.1.1. Remove Conditional Formatting

You can remove comditional formatting in selected cells or the entire worksheet. To remove conditional formatting in a worksheet:

1. If removing from selected cells, select those cells in the sheet. This is not necessary if you are removing it from the entire worksheet.
2. From the **Home** tab of the Ribbon, in the **Styles** group, click **Conditional Formatting**, select **Clear Rules**, and then select either **Clear Rules from Selected Cells** or **Clear Rules from Entire Sheet**.



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Exercise 20: Using Conditional Formatting

15 to 25 minutes

In this exercise, you will practice using conditional formatting in a number of different ways.

1. Open `Conditional Formatting.xlsx` from your `Excel2019.2/Exercises` folder.
2. In **Sheet1**, in the **Listing Price** column, highlight the most expensive 20% of houses using yellow fill with dark yellow text.
3. In **Sheet1**, in the **Town** column, highlight all cells containing "Fayetteville" using light red fill.
4. In **Sheet1**, in the **Square Feet** column, use blue gradient fill to visually demonstrate the size of each house.
5. In **Sheet1**, in the **Bedrooms** column, highlight all cells showing 4 bedrooms using a red border.
6. In **Sheet1**, in the **Bathrooms** column, use icon indicators to draw attention to houses that have 1 or 4 bathrooms.
7. In **Sheet2**, in the **Date Due** column, highlight all past dates in light red fill with dark red text, current dates in yellow fill with dark yellow text, and future dates in green fill with dark green text. Try for fun: When creating the rules, instead of entering today's actual date, enter "**=today()**" (do not enter the quotation marks).

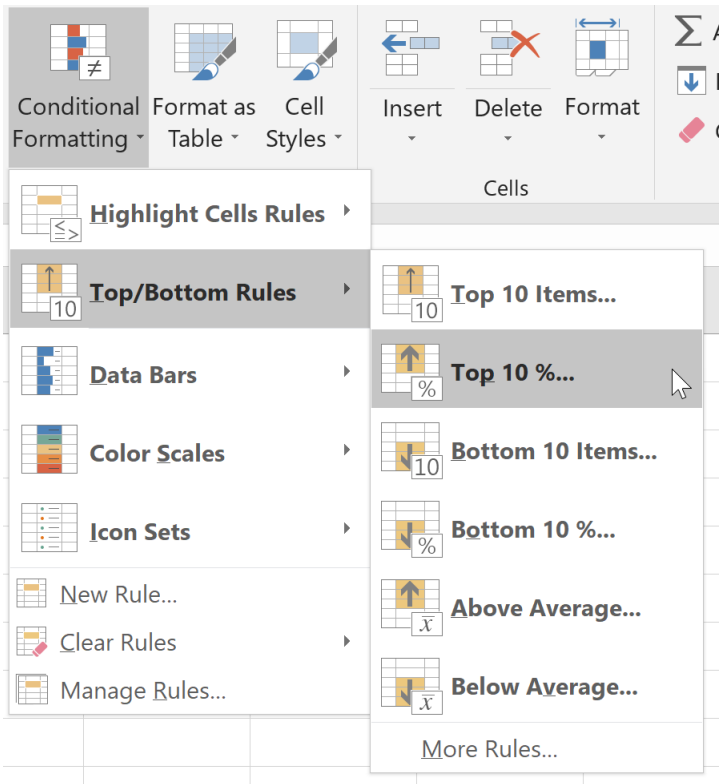
Evaluation Copy

Solution

1. In **Sheet1** in the **Listing Price** column, highlight the most expensive 20% of houses using yellow fill with dark yellow text.

   A. Select column **B**.

   B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Top/Bottom Rules**, and then **Top 10%...**:



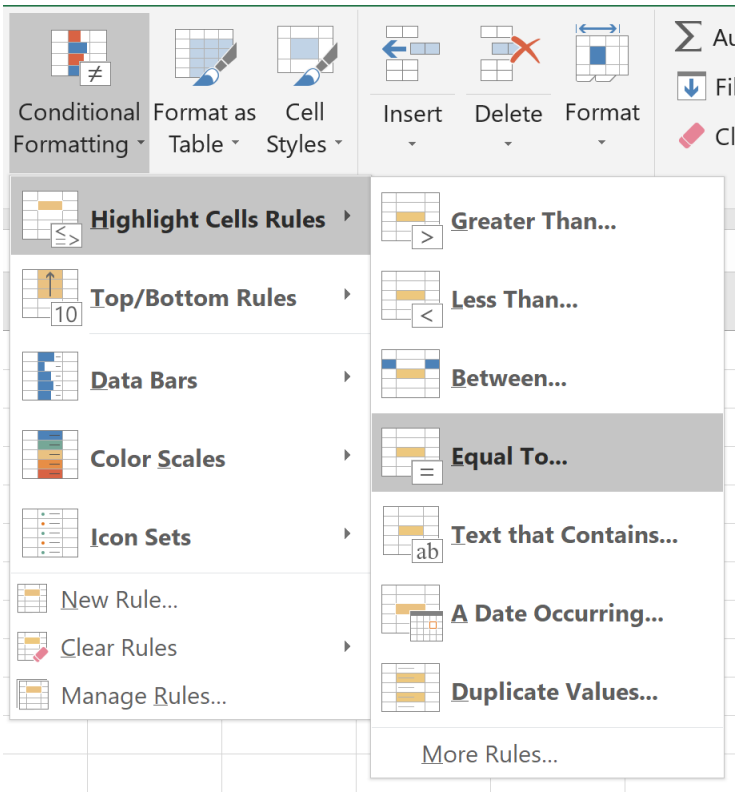
   C. In the **Top 10%** dialog box, increase the % to "**20**", select **Yellow Fill with Dark Yellow Text**, and click **OK**:

2. In **Sheet1**, in the **Town** column, highlight all cells containing "Fayetteville" using light red fill.

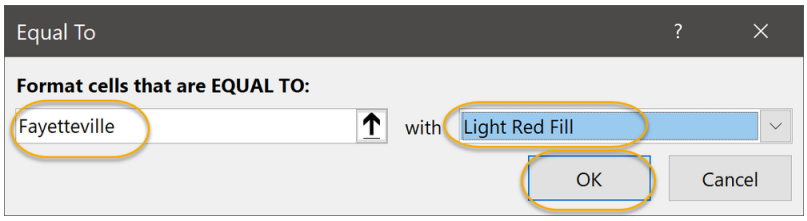
EVALUATION COPY: Not to be used in class.

A. Select column **C**.

B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Highlight Cells Rules**, and then **Equal To...**:



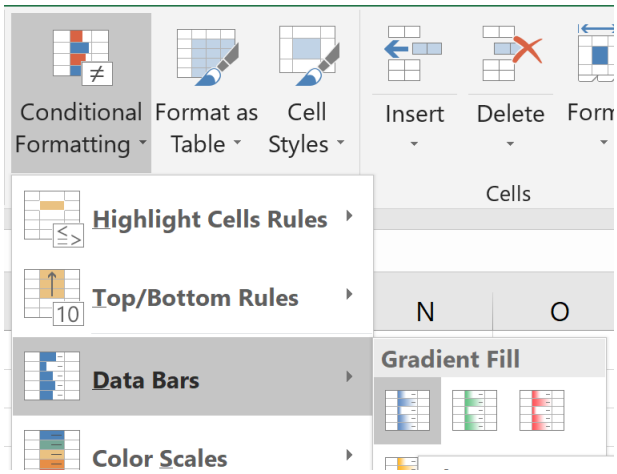
C. In the **Equal To** dialog box, enter "**Fayetteville**", select **Light Red Fill**, and click **OK**:



3. In **Sheet1**, in the **Square Feet** column, use blue gradient fill to visually demonstrate the size of each house.

A. Select column **D**.

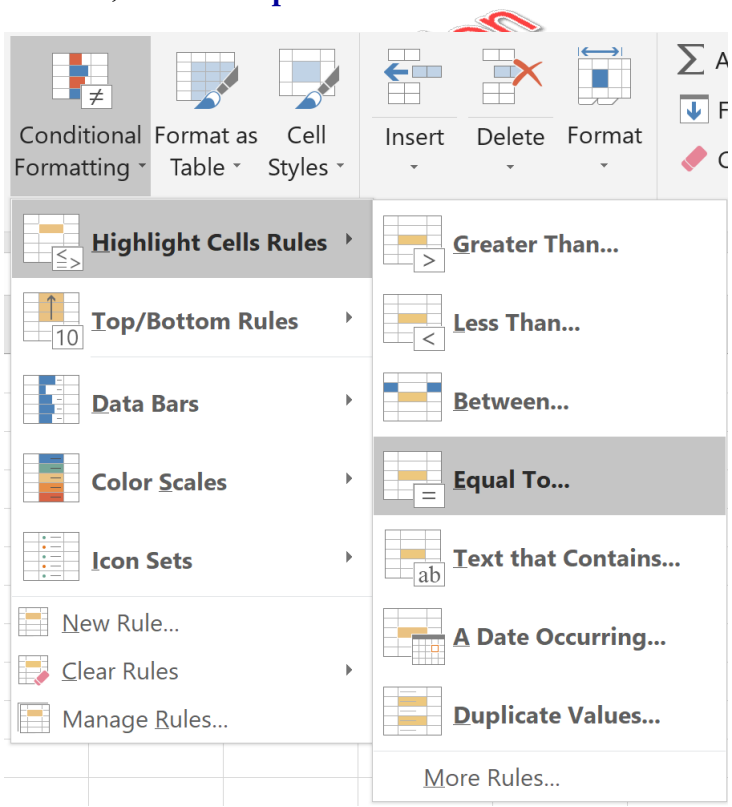
B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Data Bars**, and then under **Gradient Fill** select **Blue Data Bar**:



4. In **Sheet1**, in the **Bedrooms** column, highlight all cells showing 4 bedrooms with a red border.

   A. Select column **E**.

   B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Highlight Cells Rules**, and then **Equal To...**:



   C. In the **Equal To** dialog box, enter "**4**", select **Red Border**, and click **OK**:

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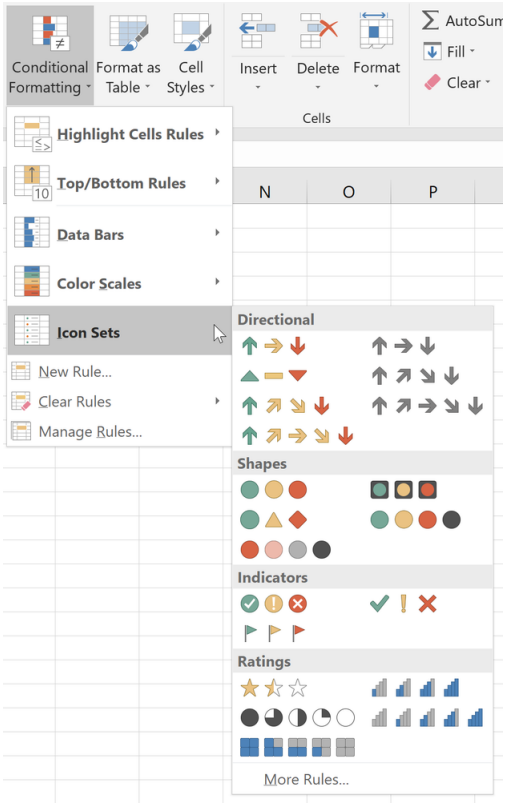
5. In **Sheet1**, in the **Bathrooms** column, use icon indicators to draw attention to houses that have 1 or 4 bathrooms.

   A. Select column **F**.

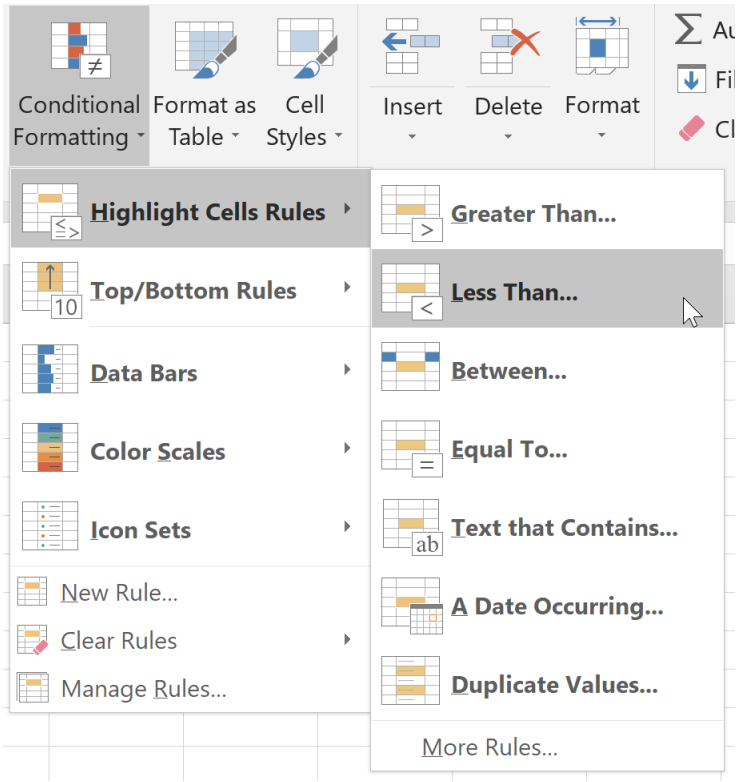
   B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Icon Sets**, and then select one of the options under **Indicators**:



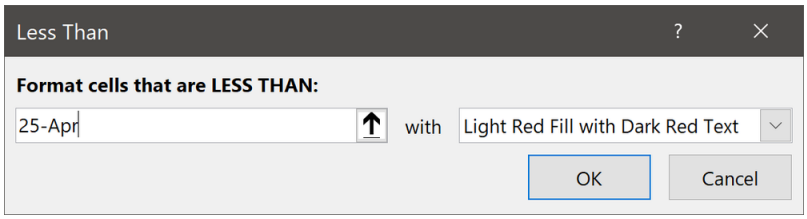
6. In **Sheet2**, in the **Date Due** column, highlight all past dates in light red fill with dark red text, current dates in yellow fill with dark yellow text, and future dates in green fill with dark green text.

   A. Select cells **B2:B9**.

B. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Highlight Cells Rules**, and then **Less Than...**:



C. In the **Less Than** dialog box, enter today's date, select **Light Red Fill with Dark Red Text**, and click **OK**:



D. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Highlight Cells Rules**, and then **Equal To...**:

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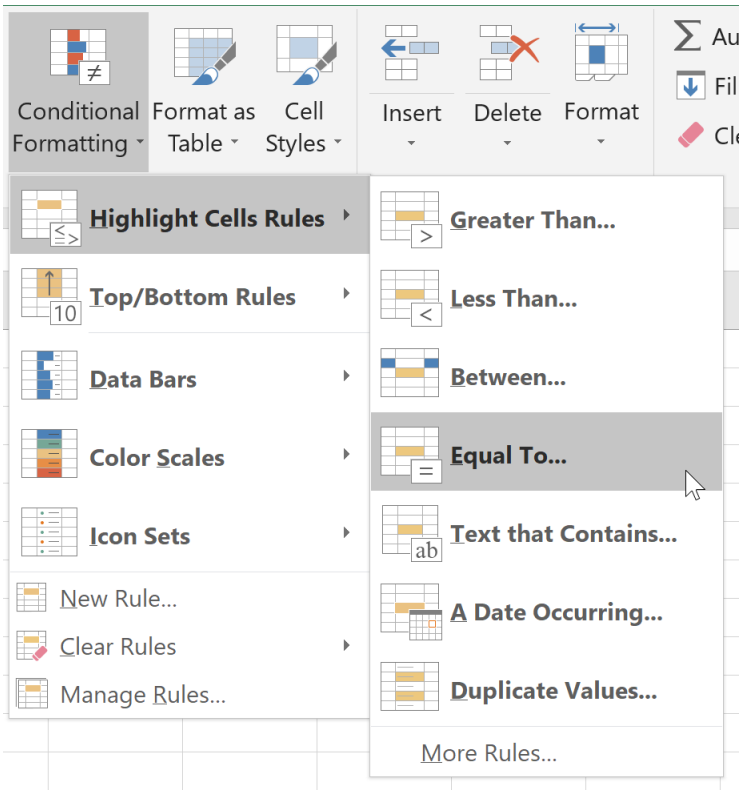
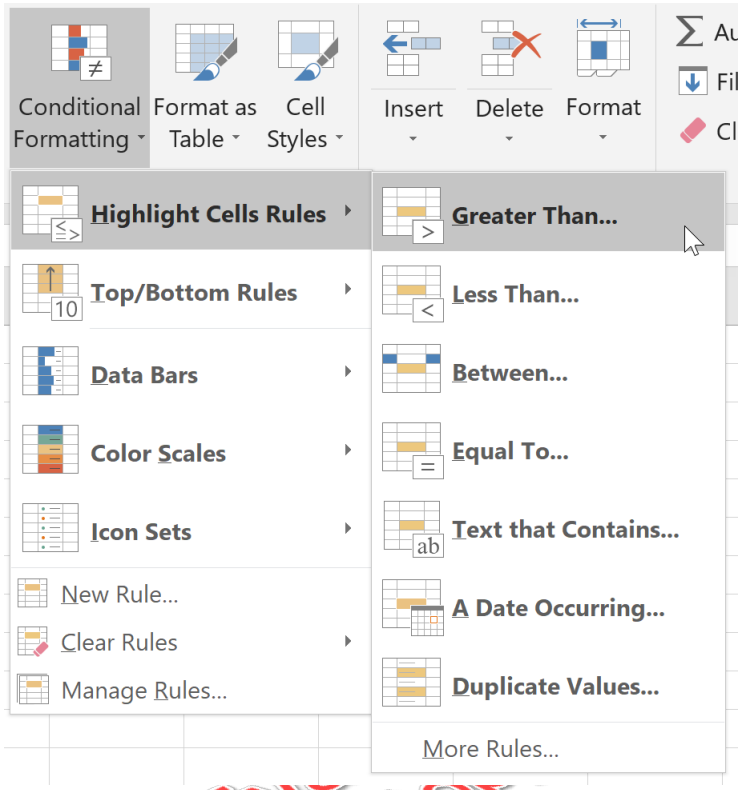
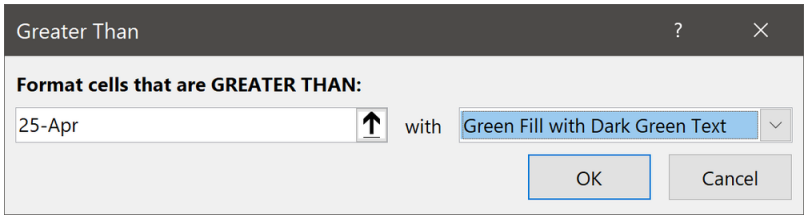


E. In the **Equal To** dialog box, enter today's date, select **Yellow Fill with Dark Yellow Text**, and click **OK**:

F. On the **Home** tab, in the **Styles** group, click **Conditional Formatting**, **Highlight Cells Rules**, and then **Greater Than...**:



G. In the **Greater Than** dialog box, enter today's date, select **Green Fill with Dark Green Text**, and click **OK**:



6.2. Working with Styles

Styles can be applied both to tables and to individual or groups of cells. Styles can also be applied to charts and illustrations, though applying styles to charts and illustrations is not covered in this lesson.

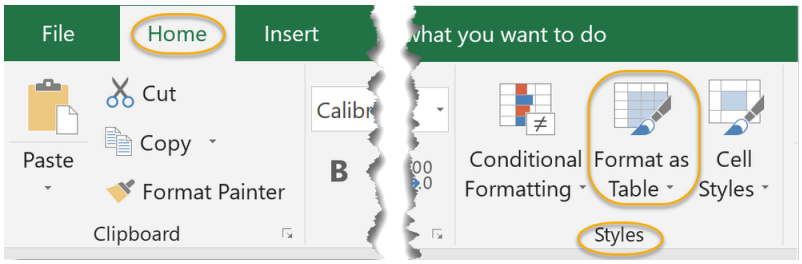
EVALUATION COPY: Not to be used in class.

❖ 6.2.1. Applying Styles to Tables

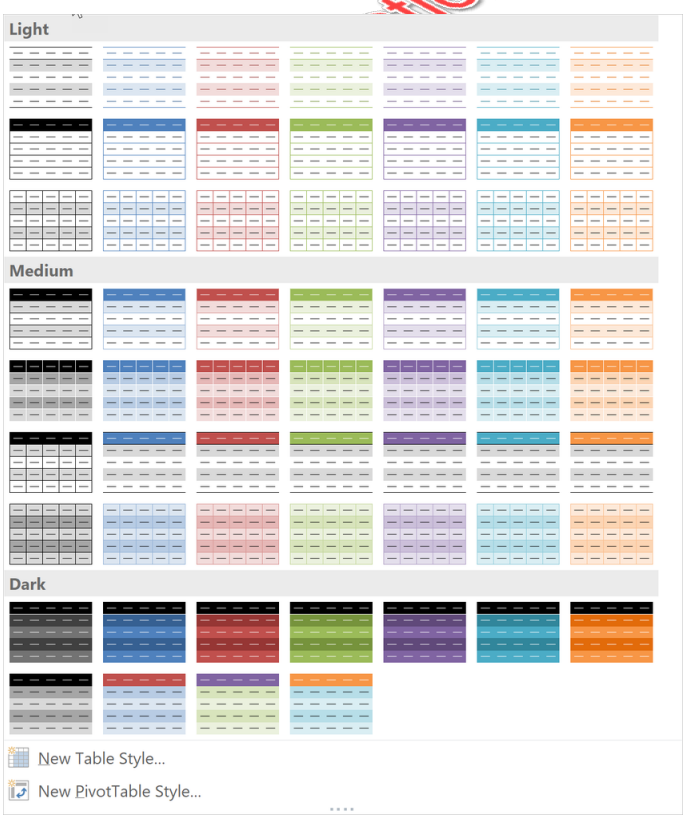
Converting Data to a Table

If your data is not already formatted as a table, then convert it to a table:

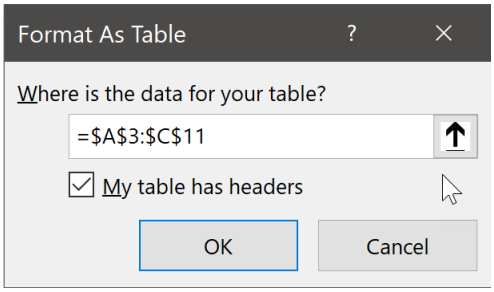
1. Select the cells you wish to convert to a table. If you select just one cell, then Excel will guess which other cells you wish to include and will ask you to verify.
2. On the **Home** tab, in the **Styles** group, click the **Format as Table** command:



3. Select one of the options from the drop-down list:



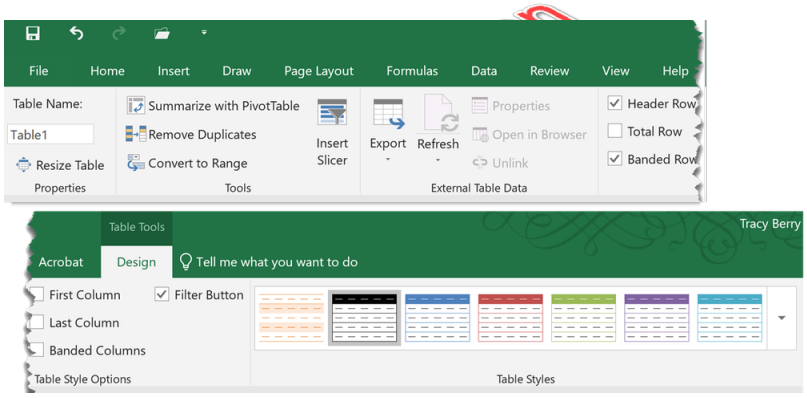
4. In the **Format As Table** dialog box, verify which cells contain the data for the table and click **OK**:



Note: Lists can also be converted to tables using the ***Table*** *command on the* ***Insert*** *tab. This is covered in the lesson on working with lists.*

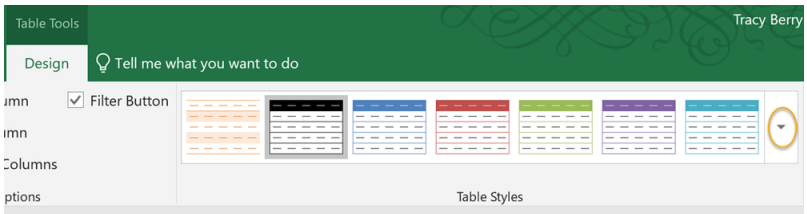
Changing the Style Applied to Your Table

When you select a cell in a table, the **Table Tools Design** tab appears:



To change the style applied to your table:

1. Select any cell in your table.
2. Click the **More** arrow in the **Table Styles** group to see all the styles available:



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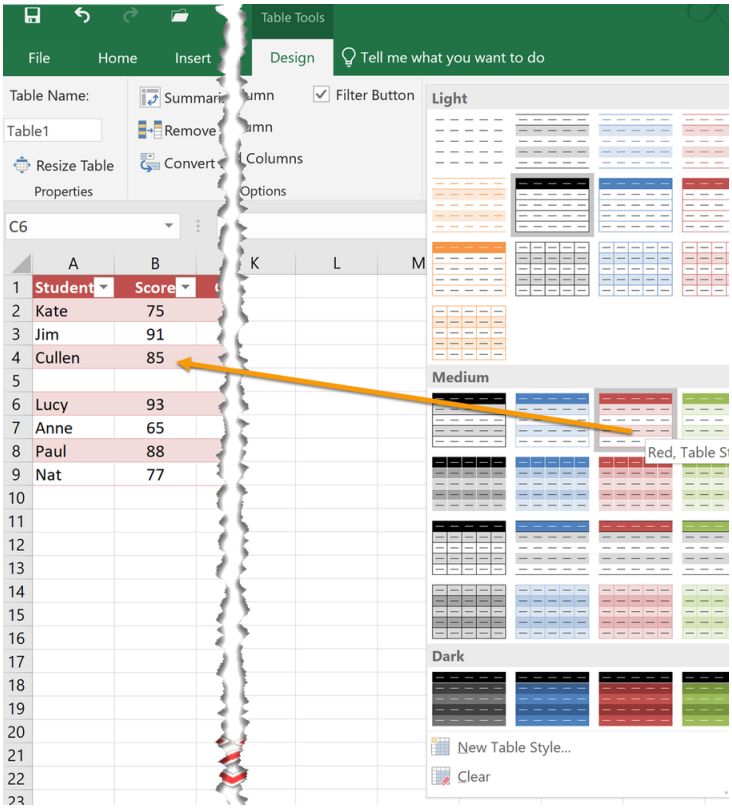
3. Move your mouse over the many different styles available in the **Table Styles** group to see what your table will look like if you select that style:

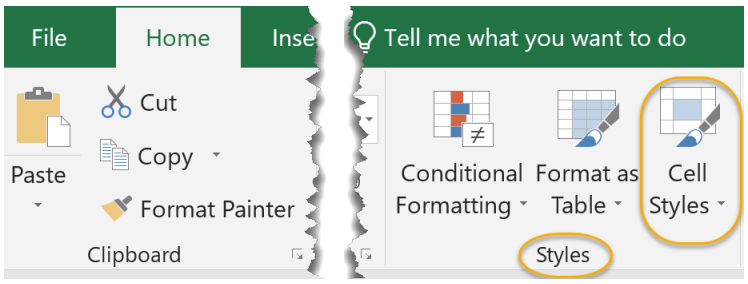


4. Select one of the styles by clicking it.

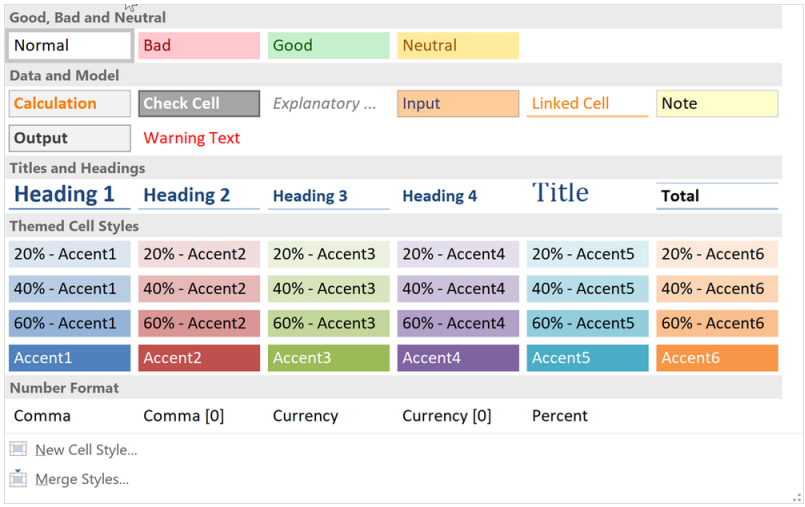
❖ 6.2.2. Applying Styles to Cells

To apply a style to a cell or group of cells:

1. Select the cell or cells to which you wish to apply a style.
2. On the **Home** tab, in the **Styles** group, click the **Cell Styles** command:



3. Move your mouse over the many different styles available in the drop-down list to see what your cell(s) will look like if you select that style:



4. Select one of the options from the drop-down list by clicking it.

Copy Styles from Template to Template

When you save a style, it is then available in the **Custom styles** category, appearing on the **Cell Styles** menu when a worksheet contains relevant cells.

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Exercise 21: Working with Styles

5 to 15 minutes

In this exercise, you will convert data to a table, change the format of the table, and format cells.

Evaluation Copy

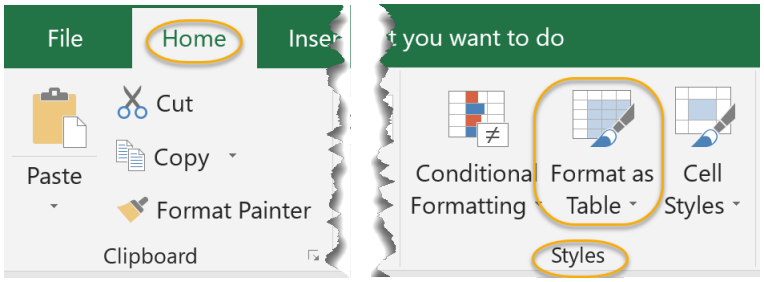
1. Open `Styles.xlsx` from your `Webucator/Excel2019.2/Exercises` folder.
2. Convert the data in cells **A3:E8** to a table using one of the **Light** styles.
3. Change the format of the table to one of the **Dark** styles.
4. Apply a cell style to cells **A1:C1**.

Solution

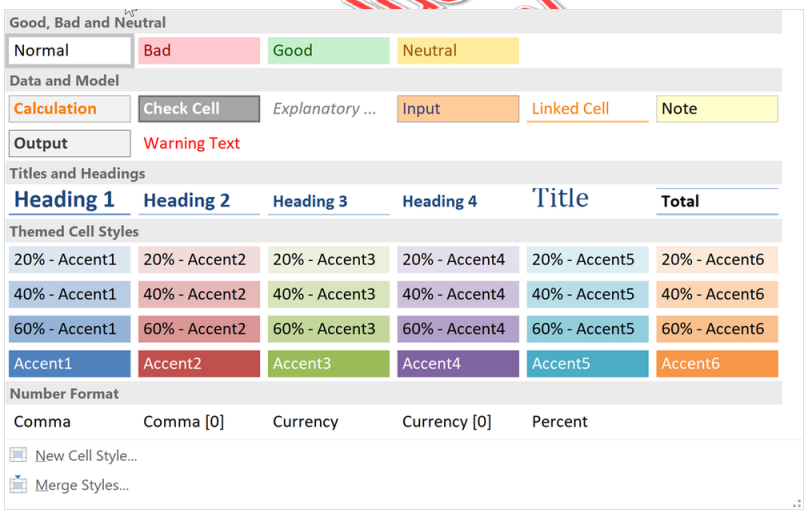
1. Convert the data in cells **A3:E8** to a table, using one of the **Light** styles.

   A. Select a cell in the range **A3:E8**:

   B. On the **Home** tab, in the **Styles** group, click the **Format as Table** command:

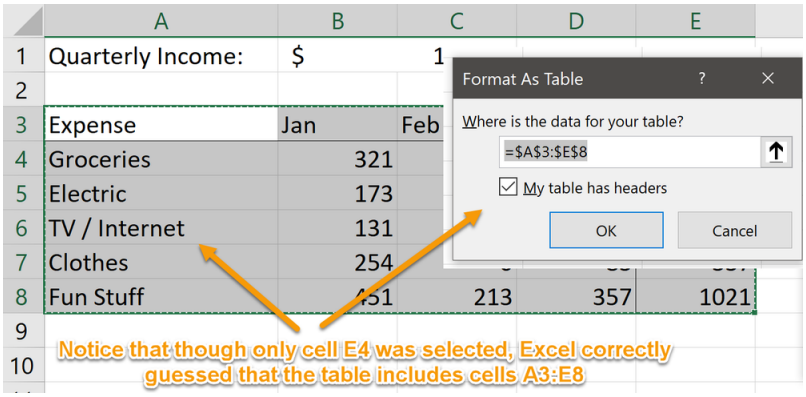


   C. Select one of the **Light** style options from the drop-down list:



   D. In the **Format as Table** dialog box, verify which cells contain the data for the table and click **OK**:

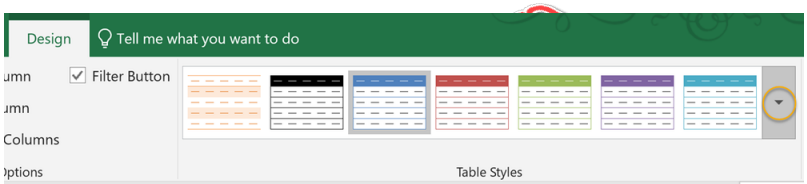
EVALUATION COPY: Not to be used in class.



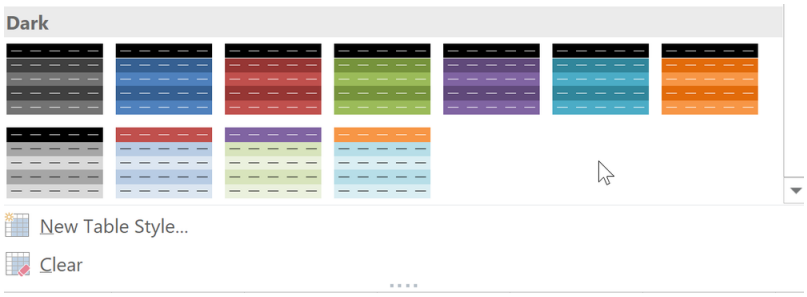
2. Change the format of the table to one of the **Dark** styles.

   A. Select a cell in the range **A3:E8**:

   B. On the **Table Tools Design** tab, click the **More** arrow in the **Table Styles** group.



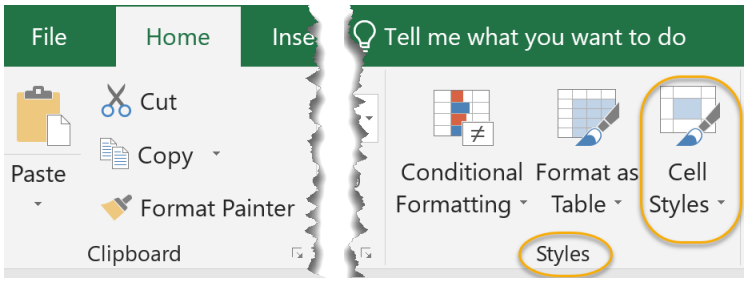
   C. Select one of the **Dark** style options from the list:



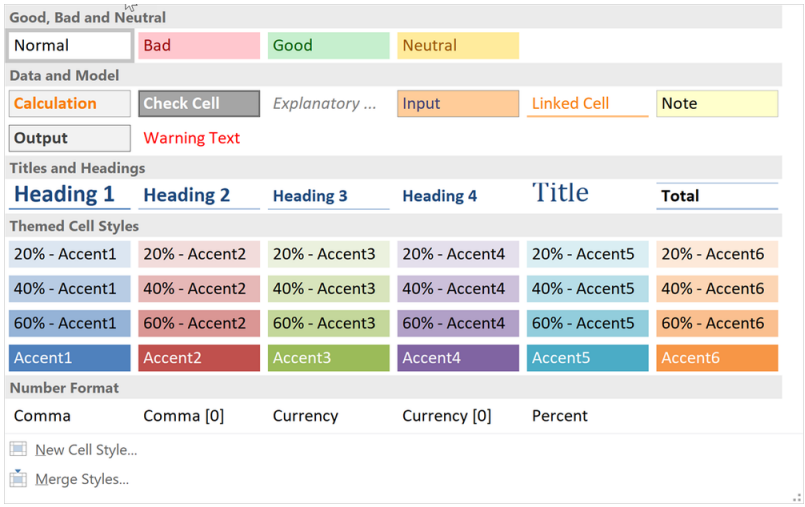
3. Apply a cell style to cells **A1:C1**.

   A. Select cells **A1:C1**.

   B. On the **Home** tab, in the **Styles** group, click the **Cell Styles** command:



C. Choose a style from the styles available by clicking it:

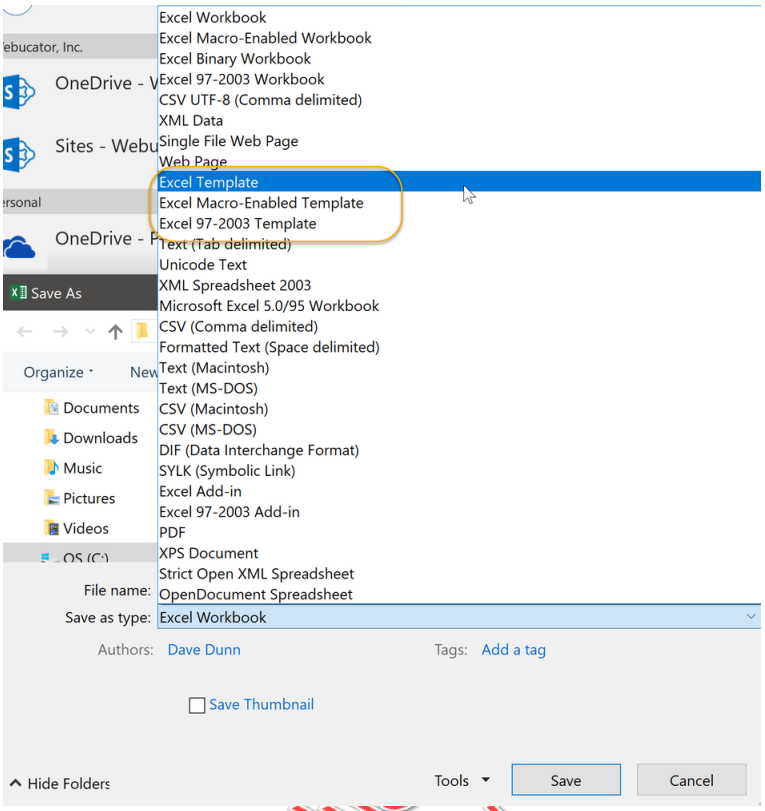


6.3. Creating and Modifying Templates

You can save a workbook as a template to use in the future. To create a custom template:

1. Select the **File** menu tab and then click **Save As**. Navigate to where you want to save the template by clicking **Browse**.
2. In the **Save As** dialog box, from the **Save as type** drop-down list, select one of the template options.

EVALUATION COPY: Not to be used in class.



Evaluation Copy

3. Click **Save** to save the template (by default, it is saved in the following location: **C:\Users\user name\Documents\Custom Office Templates**).

❖ 6.3.1. Modify a Custom Template

To modify a custom template that you have created:

1. Select the **File** menu tab and then click **Open**. Navigate to the **C:\Users\user name\Documents\Custom Office Templates** folder.
2. Open the template you wish to modify and make changes.
3. From **Backstage view**, select Save As, and then from the **Save as type** drop-down list, select one of the template options.
4. Click **Save** to save the changes.

Conclusion

In this lesson, you learned to use conditional formatting to display cells differently based on their values, to quickly format tables using styles, and to format cells using styles.