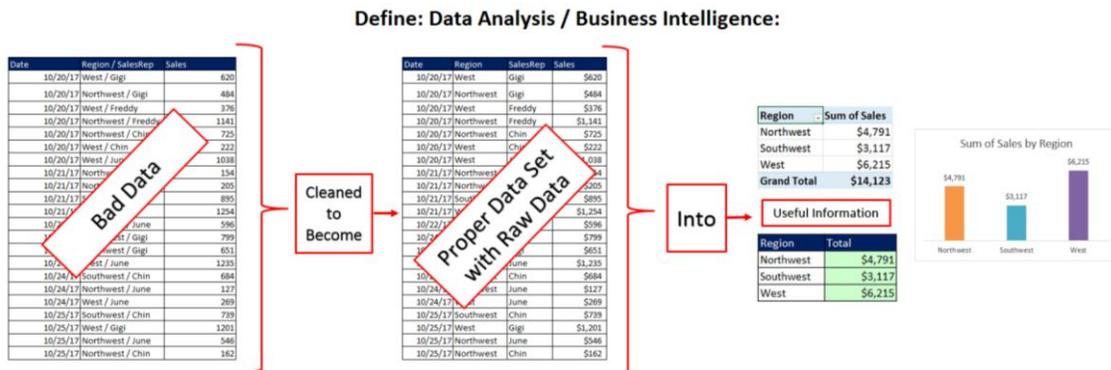


Key concepts through Excel Basic videos 01 to 25

- 1) Row and Column make up Cell
- 2) All Cells = **Worksheet** = Sheet
- 3) Name of Sheet is in Sheet Tab
- 4) All Worksheets = **Workbook** File
- 5) Default Alignment In Excel:
 - i. Text aligned Left
 - ii. Numbers aligned Right
- 6) What Excel can do:
 - i. **Make Calculations:** like calculate for % Grade or Net Income.
 - ii. **Data Analysis:** Converting Raw Data into Useful Information, like taking table of data and creating a Regional Sales Report.
- 7) Define Data Analysis / Business Intelligence:
 - i. Convert the raw data into useful information.
 1. If the data is not in a Proper Data Set and we need it to be (like for PivotTables and Filtering), then the full definition is: Import, Clean and Transform Data into a Proper Data Set and then convert the raw data into useful information.
 - ii. Here is a picture:



- 8) Examples of features and functions that can make calculations in Excel:
 - i. Formulas & Functions
 - ii. PivotTables, although normally are thought of as a Data Analysis feature, at their heart are a fast and easy way to make calculations with conditions or criteria
 - iii. Power Query (but we did not see examples in this class)
- 9) Examples of Data Analysis features in Excel:
 - i. PivotTables
 - ii. Excel Table feature
 - iii. Relationships and the Data Model
 - iv. Functions like SUMIFS, VLOOKUP, LEFT & RIGHT
 - v. Sort
 - vi. Filter
 - vii. Flash Fill
 - viii. Excel Charts
 - ix. Power Query (Get & Transform group in Data Ribbon Tab)

10) Style Formatting like: Borders, Fill Color, Font Color. Use Format Cells dialog box because it has all the options for formatting, including for Number Formatting & Borders

11) Page Setup: Be sure to do it WHEN you are printing.

12) Formulas

- i. # 1 reason to use formulas rather than other features such as PivotTable or Power Query:
 1. Formulas update instantly when source data changes. Formulas do not require a “Refresh” like PivotTables or Power Query.
- ii. Formulas are the most common Excel feature when you are making number calculations in finance, accounting, marketing, physics, chemistry and other fields.
- iii. Equal sign starts all formulas
- iv. **Excel’s Golden Rule:**
 1. If a formula input can change, put it into a cell and refer to it in the formula with a cell reference.
 2. If a formula input will not change, you can type it into a formula (like 12 months in a year or 7 days in a week).
 3. Always label your formula inputs so that the formula input can be clearly understood by any user of the spreadsheet solution; by doing this we properly “document the spreadsheet solution (model).
- v. Types of Formulas in Excel:
 1. **Number formulas** that deliver a single number answers such as a tax deduction amount or a budgetary expense amount.
 2. **Text formulas** deliver a text item such as a name or category.
 3. **Logical formulas** (Boolean Formulas) deliver a TRUE or FALSE.
- vi. The types of Formula Elements that are allowed in formulas are:
 1. Equal sign, =
 2. Cell references, like A1, \$A\$1, A1:A10, \$A\$1:\$A\$10
 3. Math operators, -, +, *, ^, and ()
 4. Numbers (if they won’t change)
 5. Built-in Functions, like SUM and ROUND
 6. Join operator: Ampersand (&)
 7. Text within quotation marks, like " , "
 8. Comparative operators, >, <, >=, <=, =, <>, like: Your Sales >= Hurdle
- vii. Cell References:
 1. Relative Cell Reference: Cell references will move throughout the copy action.
 2. Absolute Cell References are Cell References that “Do Not Move” as you copy a formula.
 3. Mixed Cell References with Row Locked – Example: A\$1
 4. Mixed Cell References with Column Locked – Example: \$A1
 5. Keyboard to Toggle Cell References = F4 Key.
- viii. Order that Excel Calculates a formula:
 1. Parenthesis ()
 2. Reference Operators: colon, comma
 - i. Example of colon in range of cells: =SUM(A1:A4)
 - ii. Example of comma (union): =SUM(E10:G10,E14:G14)
 3. Negation (-)
 - i. Example: = -2^4 = 16
 - ii. Example: = -(2^4) = -16
 4. Converts % (1% to .01)

5. Exponents (^)
 - i. Example: $3^2 = 9$
6. Multiplication (*) and Division (/), left to right
7. Adding (+) and Subtracting (-), left to right
8. Ampersand (&)
9. Comparative symbols: =, <>, >=, <=, <, >
- ix. Assumption Tables (Formula Inputs) & Mixed Cell Reference Notes
 1. When you are copying a formula through rectangular range (like with an expenses formula that has expenses as a percentage of revenue as row headers and revenue as column headers, in order to use Mixed Cell References, the Assumption table has to be orientated in the same way as the table with formulas:
 2. For Mixed Cell References and Assumption Tables:
 - i. Horizontal / Horizontal works.
 - ii. Vertical / Vertical works.
 - iii. Horizontal / Vertical will NOT work.
- x. The beauty of Excel: When formula inputs are changed, everything updates in the workbook!!

13) Number Formatting

- i. Façade that sits on top of the numbers
- ii. The number that is actually in the cell can be different than what you see in the cell
- iii. Formulas do not see Number Formatting – they act on the underlying number.
- iv. Two important examples:
 1. Date Number Formatting:
 - i. Under the Date Number Format is a Serial Number that represents the number of days since December 31, 1899. This allows Date Math like subtracting two dates to find the number of days between two dates.
 2. Time Number Formatting:
 - i. Under the Time Number Format is a serial number that represents the proportion of one 24-hour day. This allows Time Math like subtracting two times and multiplying by 24 to find the number of hours worked between two times.
- v. Use Format Cells dialog box because it has all the options for formatting, including for Number Formatting & Borders

14) ROUND Function

- i. When you MUST use ROUND:
 1. You are required to round, like with Money.
 2. You have extraneous decimals, like past the penny position. This occurs often when you multiply or divide decimals.
 3. You will use formula result in a subsequent formula.
- ii. Rules for second argument in ROUND:
 1. Round to penny (hundredths position) use 2
 2. Round to dollar (ones position) use 0
 3. Round to thousands (thousands position) use -3

15) VLOOKUP Function:

- i. What does VLOOKUP Function do?
 1. VLOOKUP tries to find a match of an item in the first column of the Lookup Table and then retrieves (goes and gets) something from one of the other columns in the table and bring it back to the cell or formula.
 2. In VLOOKUP the V means Vertical.
- ii. VLOOKUP Function arguments
 1. **lookup_value** = Item that you are trying to find in first column of lookup table.
 2. **table_array** = Vertical table = Lookup table. First Column contains items you want to “match” with the lookup_value.
 3. **col_index_num** = Which column in the lookup table has the items that you want to go and get and bring back to the cell? You have to count to determine which columns contains the items you want to retrieve: is it column 2, or column 3, or column 4, and so on.
 4. **[range_lookup]** = Because there are two different types of lookup, we must tell VLOOKUP which of the two lookups we want it to do: either: Approximate Match Lookup (1, TRUE, or omitted) or Exact Match Lookup (0 or FALSE). This argument tells VLOOKUP how to find a match in the first column of the Lookup Table.
 - i. How Approximate Match works:
 1. For Approximate Match the VLOOKUP table MUST be sorted on the first column: Ascending, A to Z (Small to Big).
 2. This is how Approximate Match Lookup works:
 - i. It will look through the first column:
 1. If the first value in the table is smaller than the lookup_value, VLOOKUP returns a Not Available Error: #N/A!
 2. Then it looks through the first column until it bumps into the first value bigger than it and then jump back one row. When it finds a match, it knows what row it should look in.
 - i. It actually does a “binary search”, which is a technical computer term for “Approximate Match”. “Binary Search” calculates quickly compared to “Exact Match”.
 3. If the lookup_value is bigger than the last value, it stops at the last row.
 - ii. How **Exact Match** works:
 1. VLOOKUP will look though each item in the first column of the VLOOKUP table and try to find a match. When it finds a match, it knows what row it should look in.
 2. If VLOOKUP cannot find a match it will give an #N/A! error that tells you it did not find a match “it is not available”.
 3. ****Note about Exact Match:** If you have very large data sets, Exact Match Lookup may cause formula to calculate slowly because “Exact Match” Lookup must look through every item, one-by-one, until it finds a match.

16) Comparative Operators

=	Equal: are two things equal?
<>	Not: are two things not equal? Type less than symbol, then greater than symbol.
>	Greater than: is the thing on the left greater than the thing on the right?
>=	Greater than or equal to: is thing on the left greater than or equal to thing on the right?
<	Less than: is the thing on the left less than the thing on the right?
<=	Less than or equal to: is the thing on the left less than or equal to the thing on the right?

Comparative Operator:	=	>	>=	<	<=	<>
Possible Words:	equal	greater than	greater than or equal to	less than	less than or equal to	not
		more than	at least	below	at most	complement of
		above	no less than	under	no more than	
			X or more		X or less	
Examples of Words:	equals 2000	greater than 2000	greater than or equal to 2000	less than 2000	less than or equal to 2000	not 2000
		more than 2000	at least 2000	below 2000	at most 2000	complement of 2000
		above 2000	no less than 2000	under 2000	no more than 2000	
			2000 or more		2000 or less	
	If Hurdle:					
	2000					

17) Logical Tests

- i. A Logical Test is a test that evaluates to TRUE or FALSE.
- ii. Logical Tests have only two possible answers: TRUE or FALSE.
- iii. Examples of Single Logical Tests:
 1. "Busn" = "Busn" this evaluates to TRUE
 2. "ECON" = "Busn" this evaluates to FALSE
 3. 3.2>=3 this evaluates to TRUE
 4. 2.7>=3 this evaluates to FALSE
 5. 12=12, this evaluates to TRUE
 6. 11=12, this evaluates to FALSE
 7. "Dog"="Dog" , this evaluates to TRUE
 8. "Cat"="Dog" , this evaluates to FALSE
 9. 500>=500, this evaluates to TRUE
 10. 499.99>=500, this evaluates to FALSE
- iv. Excel and Access are not case sensitive. For example: "BUSN" = "Busn"

18) AND Logical Test

- i. The Goal of an AND Logical Test is to run two or more logical tests and see if ALL logical tests evaluate to TRUE.
- ii. Think of: "If you take out the garbage AND clean the table, you get desert". Only if you get two TRUES (took out garbage AND cleaned the table) do you get desert.
- iii. For an AND Logical Test with two tests we can get these possible answers:
 1. FALSE, FALSE
 2. TRUE, FALSE
 3. FALSE, TRUE
 4. **TRUE, TRUE.**
- iv. Only #4 example (TRUE, TRUE) will yield a TRUE from the AND Logical Test.
- v. For an AND Logical Test to evaluate to TRUE, you must get "All Are TRUE".

19) IF Function:

- i. Use IF function to put one of two things into a cell or formulas
- ii. You can put:
 1. Two Numbers
 2. Two Words (also referred to as Text or Text String)
 3. Two Formulas
 4. Two anything, like a Formula or Text

20) IS Functions

- i. IS Functions allow you to ask a question and get a TRUE or FALSE answer.
- ii. Types of questions that you ask with IS Functions:
 1. Is the value a Number?
 2. Is the value Text?
 3. Is the value a formula?

21) SUMIFS, COUNTIFS, AVERAGEIFS, MINIFS, MAXIFS Functions:

- i. These functions can make calculations with one or more conditions.
- ii. When you have one or more conditions you are doing an AND Logical Test.
- iii. List of functions:
 1. SUMIFS: Adds numbers with one or more conditions or criteria
 2. COUNTIFS: Counts with one or more conditions or criteria
 3. AVERAGEIFS: Averages numbers with one or more conditions or criteria
 4. MAXIFS: Finds Maximum number with one or more conditions or criteria
 5. MINIFS: Finds Minimum number with one or more conditions or criteria

22) Proper Data Set contains:

- i. "Column Headers" / "Field Names" in First Row.
- ii. Each row contains a record or transaction
- iii. Leave empty cells or Excel column/row headers around the entire Proper Data Set.

23) Excel Table feature

- i. When you convert a Proper Data Set to an Excel Table, the benefits are:
 1. Formulas, Charts, PivotTables, Relationships and the Data Model, Power Query and other features will update when new records are added or removed.
 2. Some features like Power Query and Relationships and the Data Model will not work unless the Excel Data is in an Excel Table.
- ii. When you use ranges from an Excel Table, Table Formula Nomenclature is used. For example, when you highlight the Date Field in a table named fSales, rather than see a range like A2:A20, you will see the table name and the field name in square brackets like this: fSales[Date].

24) Defined Names

- i. If you are going to use the same range over and over, and you don't want to use the Excel Table feature, you can use the Defined Name feature.
- ii. You can create a Defined Name by:
 1. Selecting a range, clicking in the Name Box, Type Name, hit Enter
 2. You can also use the "Create Name From Selection" button in the Formulas Ribbon Tab.
 3. You can edit or delete Defined Names in the Name Manager.

25) PivotTables

- i. What PivotTables do:
 1. Create Summary Reports that contain calculations with Conditions or Criteria.
- ii. Summary of how to create PivotTable:
 1. Click in one cell in Proper Data Set
 2. Insert Ribbon Tab, Tables group, PivotTable button.
 - i. Keyboard = Alt, N, V.
 3. From Field List, drag field name to Rows area or Columns area or Filter area. These are the conditions/criteria for the calculation in the Values area of the PivotTable.
 - i. Fields in the Rows area add a condition/criterion to the row
 - ii. Fields in the Columns area add a condition/criterion to the column
 - iii. Fields in the Filter area add a condition/criterion to the entire PivotTable.
 4. From Field List drag the field you would like to make a calculation on to values area.
 - i. Number fields default to a SUM calculation (add numbers)
 - ii. Text fields default to a COUNTA calculation (count non-empty cells)
 5. With a cell selected in the PivotTable, click on PivotTable Tools Design Ribbon Tab, go to the Layout group, click drop-down for Report Layout and then click on "Show in Tabular Form" or "Show in Outline Form". These Layouts shows the Field Names in your Report.
 6. To add Number Formatting to the Values area of the PivotTable, click in one cell in the Values area of the PivotTable, Right-click the cell and click on "Number Format...", then in the Number Formatting dialog box select the Number Formatting that you would like and then click OK.
 7. Slicers can be added to the PivotTable to add a condition/criterion to the entire PivotTable, similar to a field in the Filter area. To insert a Slicer into a PivotTable, click in one cell in the PivotTable Report, then go to the PivotTable Tools Analyze Ribbon Tab, then in the Filter Group, click the Insert Slicer button
 8. If you want to change the summary calculation in the Values area, right-click the Values area in the PivotTable Report, point to one of these two options:
 - i. "Summarize Values By" and then select an aggregate calculation such as "Average", or "Max", or "More Options".
 - ii. "Show Values As" and then select a calculation such as "% of Column Total", "Running Total", "Difference From" or other calculations.

26) Making Calculations with Conditions or Criteria

- i. "Calculations with Conditions or Criteria " is an important concept in business because most reports contain calculations with conditions or criteria
- ii. Example of adding sales with one condition using SUMIFS. Here we are adding the sales for "Northwest":

13	Date	Region	SalesRep	Sales	Region	Total
14	10/20/17	West	Gigi	\$620	Northwest	=SUMIFS(\$D\$14:\$D\$35,\$B\$14:\$B\$35,F14)
15	10/20/17	Northwest	Gigi	\$484	Southwest	
16	10/20/17	West	Freddy	\$376	West	

1.

- iii. Example of adding sales with one condition using PivotTable. The selected cell shows adding the sales for "Northwest":

13	Date	Region	SalesRep	Sales
14	10/20/17	West	Gigi	\$620
15	10/20/17	Northwest	Gigi	\$484
16	10/20/17	West	Freddy	\$376
17	10/20/17	Northwest	Freddy	\$1,141
18	10/20/17	Northwest	Chin	\$725
19	10/20/17	West	Chin	\$222
20	10/20/17	West	June	\$1,038
21	10/21/17	Northwest	Chin	\$154
22	10/21/17	Northwest	Gigi	\$205
23	10/21/17	Southwest	Gigi	\$895
24	10/21/17	West	Chin	\$1,254
25	10/22/17	Northwest	June	\$596
26	10/24/17	Southwest	Gigi	\$799
27	10/24/17	Northwest	Gigi	\$651
28	10/24/17	West	June	\$1,235
29	10/24/17	Southwest	Chin	\$684
30	10/24/17	Northwest	June	\$127
31	10/24/17	West	June	\$269

Region	Sum of Sales
Northwest	\$4,791
Southwest	\$3,117
West	\$6,215
Grand Total	\$14,123

PivotTable Fields

Choose fields to add to report:

Search

Date
 Region
 SalesRep
 Sales

More Tables

Drag fields between areas below:

Filters | **Columns**

Rows | **Values**

Region | Sum of Sales

1.

- iv. Example of averaging sales with one condition using PivotTable. The selected cell shows an average of sales in "Northwest" Region:

13	Date	Region	SalesRep	Sales
14	10/20/17	West	Gigi	\$620
15	10/20/17	Northwest	Gigi	\$484
16	10/20/17	West	Freddy	\$376
17	10/20/17	Northwest	Freddy	\$1,141
18	10/20/17	Northwest	Chin	\$725
19	10/20/17	West	Chin	\$222
20	10/20/17	West	June	\$1,038
21	10/21/17	Northwest	Chin	\$154
22	10/21/17	Northwest	Gigi	\$205
23	10/21/17	Southwest	Gigi	\$895
24	10/21/17	West	Chin	\$1,254
25	10/22/17	Northwest	June	\$596
26	10/24/17	Southwest	Gigi	\$799
27	10/24/17	Northwest	Gigi	\$651
28	10/24/17	West	June	\$1,235
29	10/24/17	Southwest	Chin	\$684
30	10/24/17	Northwest	June	\$127
31	10/24/17	West	June	\$269

Region	Average of Sales
Northwest	\$479
Southwest	\$779
West	\$777
Grand Total	\$642

PivotTable Fields

Choose fields to add to report:

Search

Date
 Region
 SalesRep
 Sales

More Tables

Drag fields between areas below:

Filters | **Columns**

Rows | **Values**

Region | Average of Sales

1.

- v. Example of adding sales with two condition / criteria using PivotTable. The interesting cell is an example of adding sales that were by the SalesRep "Chin" in the Region "Northwest":

Sum of Sales	Region	Southwest	West	Grand Total
June	\$1,269		\$2,542	\$3,811
Chin	\$1,041	\$1,423	\$1,476	\$3,940
Freddy	\$1,141		\$376	\$1,517
Gigi	\$1,340	\$1,694	\$1,821	\$4,855
Grand Total	\$4,791	\$3,117	\$6,215	\$14,123

1.

- vi. Example of counting with two condition / criteria using COUNTIFS Function to count how many Business classes you had with a grad of 3.0 or higher. In this example COUNTIFS has to count the records that contain the Department "BUSN" AND has a grade that is equal to or bigger than 3.0. This means that for each record in the Proper Data Set, there has to be the text "BUSN" in the Department Field AND a number greater than or equal to 3 in the Grade Field.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Quarter	Year	Department	Class #	Credits	Grade		Goal: Count How Many Business Classes You Had With a Grade of 3.0 or Higher						
2	Fall	2015	MATH	97	5	3.2		Criteria:						
3	Winter	2016	BUSN	210	5	4		Department	Grade					
4	Winter	2016	ECON	201	5	2.2		BUSN	>=3					
5	Winter	2016	BUSN	101	5	1.8		Count		8	=COUNTIFS(C2:C24,H4,F2:F24,I4)			
6	Spring	2016	MATH	148	5	2		COUNTIFS counts with two conditions/criteria						
7	Spring	2016	ECON	202	5	2								
8	Spring	2016	BUSN	133	5	3.4								
9	Sum	2016	BUSN	102	5	1.8								
10	Sum	2016	BUSN	135	5	3								
11	Fall	2016	BUSN	216	5	3.6								
12	Fall	2016	BUSN	205	5	2.4								
13	Fall	2016	BUSN	268	5	3.6								
14	Winter	2017	COMM	101	5	3.1								
15	Winter	2017	ENGL	101	5	2.6								
16	Winter	2017	BUSN	218	5	3.1								
17	Spring	2017	BUSN	190	5	2.7								
18	Spring	2017	COMM	205	5	3.3								
19	Spring	2017	BI	348	5	3.9								
20	Sum	2017	Accgt	121	5	3.8								
21	Sum	2017	BUSN	270	5	3.1								
22	Fall	2017	ENGL	205	5	3.7								
23	Fall	2017	BUSN	138	5	2.2								
24	Fall	2017	BUSN	160	5	3.2								

Department Field = "BUSN"
AND
Grade Field has number >= 3

8 Records contain
"BUSN" AND >=3

27) Compare SUMIFS and similar Functions and PivotTables for making Calculations with Conditions or Criteria.

- Advantage of PivotTable:
 1. Quick and easy to make.
 2. Conditions or Criteria in Rows or Columns area are created automatically by dragging a field to Rows or Columns area. When you drag a field to the Rows or Columns area a unique list of items from the field is created.
- Disadvantage of PivotTable:
 1. If source data changes, you must right-click PivotTable and point to Refresh.
 2. Sometimes the Conditions or Criteria you want to use in your calculation is hard to create using a PivotTable. For example, if you use a comparative operator with your Conditions or Criteria, it may be hard to create the calculation using a PivotTable.
- Advantage of SUMIFS:
 1. If source data changes, formulas update instantly.
 2. If you have Conditions or Criteria that use Comparative Operators, it is often easier to use SUMIFS and other similar Functions than it is to use a PivotTable.
- Disadvantage of SUMIFS:
 1. Have to type out conditions/criteria for Rows or Columns area.
 2. When making Calculations with Conditions or Criteria, it often takes longer to create a formula solution than it does to create a PivotTable solution.

28) Charts

- i. What Charts do:
 1. Visually portray quantitative data (number data).
 2. Give a quick impression of the number data.
 3. Create a picture that can communicate more quickly than just the numbers alone.
 4. Charts allow you to see patterns or trends that you may not be able to see if you are looking at just the number data.
- ii. Chart Types:
 5. **Column:** Use to compare differences across categories. Height of column conveys number.
 6. **Bar:** Use to compare differences across categories. Length of bar conveys number.
 7. **Stacked Column/Bar:** Good for displaying crosstabulation, emphasis on horizontal axis categories.
 8. **Clustered Column/Bar:** Good for displaying crosstabulation, emphasis on legend categories.
 9. **Line:** Use to show trend for a number variable over a category such as time.
 10. **X-Y Scatter:** Used to show relationship between two number variables (x and y variables).
- iii. # 1 Chart Rule: No Chart Junk (No elements in chart that don't help to articulate message)

29) Cleaning and Transforming Data

- i. We can Cleaning and Transforming Data using these features:
 1. Formulas, like with LEFT and RIGHT Functions
 2. Flash Fill: give it an example to the right and then Flash Fill
 3. Power Query, like when we need to Split Columns or import multiple Text Files
- ii. Cleaning data is important because we sometimes get raw data that is not in a form that we can use. For example, if we get a column with the Product, Date and Region Fields in a single column, we need to split them into separate columns so we can perform data analysis on the separate columns.

30) Relationships and the Data Model

- i. If you are using VLOOKUP to create a helper column on a Proper Data Set so you can create a PivotTable report, you can substitute Relationships and the Data Model for the VLOOKUP Helper column and gain these benefits:
 - 1. There will not be a lot of formulas that have to calculate in the Excel Workbook and this can help a workbook with many formulas to not have a slow reaction time when a new formula is created.
 - 2. The File size can be significantly smaller if we use Relationships rather than VLOOKUP.
 - 3. **Note:** For small data sets (50,000 rows or less), it is fine to use VLOOKUP.
- ii. Relationships:
 - 1. You must convert the Proper Data Sets to Excel Tables before you can use Relationships.
 - 2. When you create a Relationship, you create a One-To-Many Relationship between the first columns of the Lookup Table and the parallel column for the Many Side in the Sales Table.
 - 3. When you create a Relationship between two tables the two tables and the Relationship are stored in the "Data Model".
- iii. Data Model:
 - 1. When you create a Relationship between two tables, the tables and the Relationship are stored in a behind the scenes database called the "Data Model". This Data Model is an efficient and compact way of storing tables and relationships. If you have a lot of data using Relationships rather than VLOOKUP can significantly reduce file size and formula calculation time.

31) Sort

- i. What does Sorting do?
 - 1. Organizes a Proper Data Set (Table) or a single column in alphabetical or numeric or color order.
- ii. How to Sort:
 - 1. Click in one cell in the column that you want to sort and use the Sorting feature.
- iii. If you want to sort upon more than 1 column:
 - 1. Buttons: Major Sort is last
 - 2. Sort dialog box, Major Sort on top.

32) Filter

- i. What does Filtering do?
 - 1. For a Proper Data Set, the Filter feature allows you to specify conditions/criteria to display only the records that match the given conditions/criteria, while hiding the records that do not match.
 - 2. Once you filter a proper data set to show only the records that you want, you can copy the whole table and paste it in a new sheet or in a new workbook.

33) Flash Fill

- i. What does Flash Fill do?
 - 1. Flash Fill is a fast way to "clean" a column of data, like combining first and last name or extracting the State Abbreviation from a description.
- ii. How does Flash Fill work?
 - 1. Type enough examples to illustrate the pattern for the "cleaned data" to the right of your column and when you see the "Ghost List", hit Enter.
 - i. You give Excel one or more examples to the right of your data, and it tries to figure out what you want.
 - ii. If Excel can see your "Pattern", it will perform the action for the whole column

34) Power Query

- i. What does Power Query do:
 1. Import Data from External sources
 - i. External sources such as text files, Excel workbooks, databases and more
 2. Clean Data
 - i. Like split data in a column into three columns
 3. Transform Data
 - i. Like combining multiple tables into one Proper Data Set
- ii. If your data is in an Excel sheet, you must convert the data to an Excel Table using the Excel Table feature.
- iii. Clean Data with Power Query (Get & Transform), Flash Fill or formulas?
 1. Use Flash Fill when the data cleaning is a one-time event and you don't need the solution to update when the source data changes.
 2. Use Formulas when the data cleaning solution needs immediately update when the source data changes.
 3. Use Power Query when you need the solution to update after you click the Refresh button.
- iv. Important Data Analysis Terms:
 1. Query
 - i. The word "Query" means to ask a question.
 - ii. When we start a "Query" based on a Start or Begin Data Set, we are asking a question of the data set.
 - iii. For example:
 1. If our Start or Begin Data Set looks like this:

Description	Amount
Carlota / 05/05/2016 / West	485

 - i.
 2. We might want to ask the question or "Query": "Can I see the Description Column Split into three separate columns?", where the answer to the "Query" would look like this:

Product	Date	Region	Sales
Carlota	5/5/2016	West	485

 - i.
 2. Data Type
 - i. "Data Type" indicates what sort of data can go in a particular Field or Column.
 - ii. When you designate a Column / Field as a specific data type, you are building a more robust data storage system, because you are assuring that the right kind of data goes into the column.
 3. Delimiter?
 - i. A delimiter is a character or set of characters that separate data that should be broken apart into separate columns
 4. Why store data in Text Files?
 - i. Because there are so many different systems for storing data, the agreed upon file type "Text Files" is often used to transfer data from one system to another.