FIT1013 - Week 2 Resources

Excel Tables, PivotTables, PivotCharts and Tableau

Week 2 Resources

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References:

Microsoft Excel 2016, New Perspectives Series, Parsons, Oja, Carey, Desjardins Comprehensive Edn., Cengage Learning, **Module 5**

Tableau: **https://www.tableau.com/**

1. Objectives

- Create and modify an Excel Table
- Create and modify a PivotTable
- Apply PivotTable styles and formatting
- Filter a PivotTable
- Create a PivotChart
- Discover how Tableau works

2. Create and modify an Excel Table

How do you want to view this data?

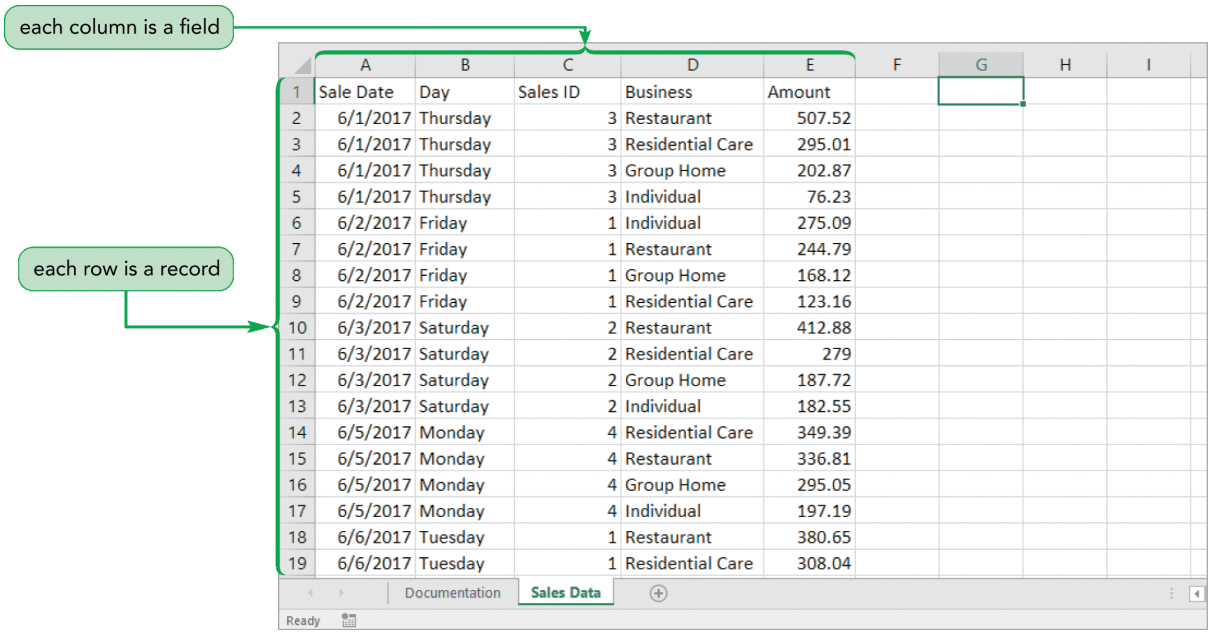
D10 fx Restaurant

	A	B	C	D	E	F	G	H	I	J
1	Sale Date	Day	Sales ID	Business	Amount					
2	1/6/17	Thursday	3	Restaurant	507.52					
3	1/6/17	Thursday	3	Residential Care	295.01					
4	1/6/17	Thursday	3	Group Home	202.87					
5	1/6/17	Thursday	3	Individual	76.23					
6	2/6/17	Friday	1	Individual	275.09					
7	2/6/17	Friday	1	Restaurant	244.79					
8	2/6/17	Friday	1	Group Home	168.12					
9	2/6/17	Friday	1	Residential Care	123.16					
10	3/6/17	Saturday	2	Restaurant	412.88					
11	3/6/17	Saturday	2	Residential Care	279					
12	3/6/17	Saturday	2	Group Home	187.72					
13	3/6/17	Saturday	2	Individual	182.55					
14	5/6/17	Monday	4	Residential Care	349.39					
15	5/6/17	Monday	4	Restaurant	336.81					
16	5/6/17	Monday	4	Group Home	295.05					
17	5/6/17	Monday	4	Individual	197.19					
18	6/6/17	Tuesday	1	Restaurant	380.65					
19	6/6/17	Tuesday	1	Residential Care	308.04					
20	6/6/17	Tuesday	1	Group Home	221.11					
21	6/6/17	Tuesday	1	Individual	192.05					
22	7/6/17	Wednesday	5	Restaurant	346.84					
23	7/6/17	Wednesday	5	Group Home	170.24					
24	7/6/17	Wednesday	5	Individual	158.33					
25	7/6/17	Wednesday	5	Residential Care	158.25					
26	8/6/17	Thursday	2	Restaurant	459.72					
27	8/6/17	Thursday	2	Individual	238.89					
28	8/6/17	Thursday	2	Group Home	217.6					
29	8/6/17	Thursday	2	Residential Care	168.59					
30	9/6/17	Friday	1	Individual	499					
31	9/6/17	Friday	1	Restaurant	330.87					
32	9/6/17	Friday	1	Group Home	207.79					
33	9/6/17	Friday	1	Residential Care	196.15					
34	10/6/17	Saturday	3	Individual	323.49					
35	10/6/17	Saturday	3	Restaurant	281.68					
36	10/6/17	Saturday	3	Group Home	194.68					

Planning a Structured Range of Data

A collection of similar data can be structured in a range of columns and rows, representing fields and records, respectively. Each column represents a field, which is a single piece of data and each row

represents a record, which is a group of related fields. A structured range of data is commonly referred to as a list or table as shown in the figure below:



	A	B	C	D	E
1	Sale Date	Day	Sales ID	Business	Amount
2	6/1/2017	Thursday	3	Restaurant	507.52
3	6/1/2017	Thursday	3	Residential Care	295.01
4	6/1/2017	Thursday	3	Group Home	202.87
5	6/1/2017	Thursday	3	Individual	76.23
6	6/2/2017	Friday	1	Individual	275.09
7	6/2/2017	Friday	1	Restaurant	244.79
8	6/2/2017	Friday	1	Group Home	168.12
9	6/2/2017	Friday	1	Residential Care	123.16
10	6/3/2017	Saturday	2	Restaurant	412.88
11	6/3/2017	Saturday	2	Residential Care	279
12	6/3/2017	Saturday	2	Group Home	187.72
13	6/3/2017	Saturday	2	Individual	182.55
14	6/5/2017	Monday	4	Residential Care	349.39
15	6/5/2017	Monday	4	Restaurant	336.81
16	6/5/2017	Monday	4	Group Home	295.05
17	6/5/2017	Monday	4	Individual	197.19
18	6/6/2017	Tuesday	1	Restaurant	380.65
19	6/6/2017	Tuesday	1	Residential Care	308.04

Some common operations for working with data are:

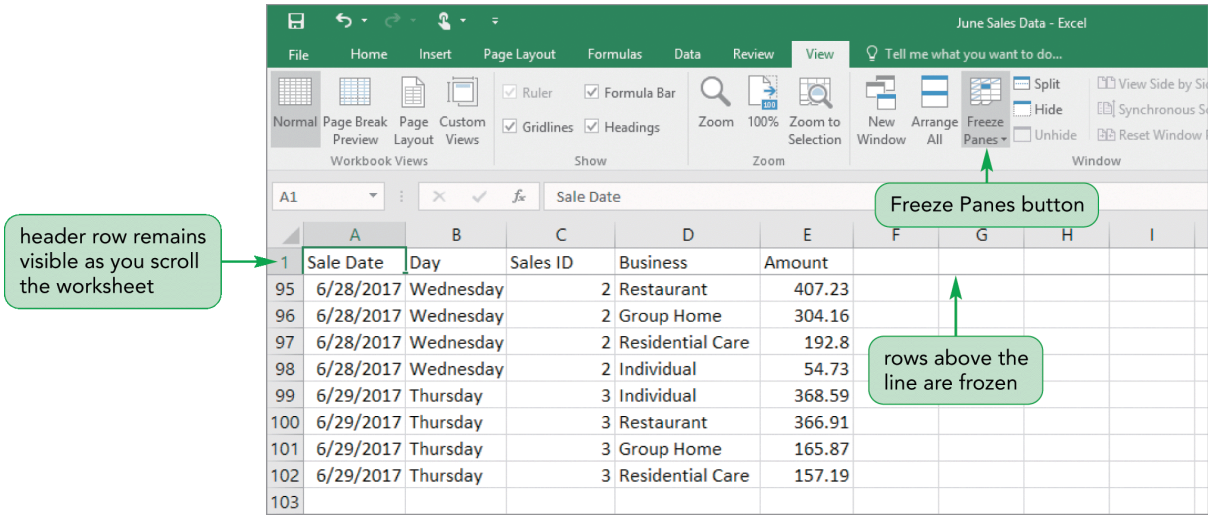
- Add, edit, and delete data in the range
- Sort the data range
- Filter to display only rows that meet specified criteria
- Insert formulas to calculate subtotals
- Create summary tables based on the data in the range (usually with PivotTables)

To create an effective structured range of data:

- Enter field names in top row of range
- Use short, descriptive field names
- Format field names to distinguish header row from data
- Enter the same kind of data in a field
- Separate data (including header row) from other information in the worksheet by at least one blank row and one blank column

Freezing Rows and Columns

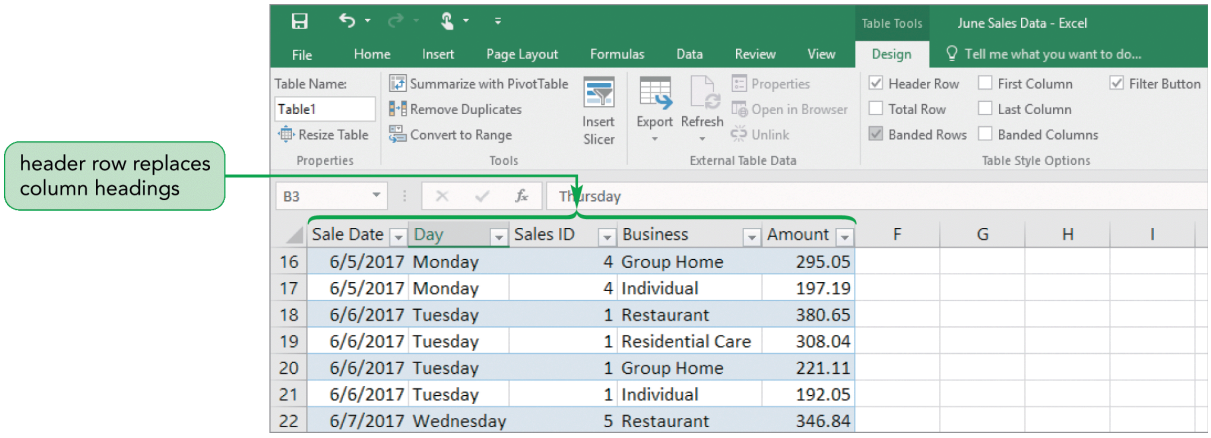
Freezing a row or column keeps headings visible as you work with data in a large worksheet. For example, you can freeze the top row, freeze the first column so that the labels are headers remain visible as you navigate through a large worksheet. You can also freeze rows and columns above and to the left of the selected cell.



Creating an Excel Table

You can convert a structured range of data into an Excel table. It enables you to easily identify, manage and analyse the groups of related data in the table. To convert your data into an Excel table, see Pg 264 (Module 5) of your prescribed textbook. When a structured range of data is converted into an Excel table, you see the following:

- A filter button in each cell of the header row
- The range formatted with a table style
- A sizing handle (a small triangle) in the lower-right corner of the last cell of the table
- The TABLE TOOLS DESIGN tab on the ribbon



Using Excel tables, you can save time by the following activities:

- Format quickly using a table style
- Add new rows and columns that automatically expand the range
- Add a Total row to calculate a summary function (SUM, AVERAGE, COUNT, MIN, MAX)
- Enter a formula in a cell that is automatically copied to all other cells in the column

- Create formulas that reference cells in a table by using table and column names

Each Excel table in a workbook must have a unique name. By default, Excel names the first table as Table1 and then the next one as Table 2, and so on. Descriptive names make it easier to identify a table by its content, e.g. JuneTbl is an Excel table containing June data. Table names must start with a letter or an underscore but we can use any combination of letters, numbers, and underscores for the rest of the name. However, table names cannot include spaces.

Modifying an Excel Table

We can modify an Excel table by adding or removing table elements or by changing the table's formatting. We can also display or hide the following:

- Header row
- Total row
- First column
- Last column
- Banded rows
- Banded columns
- Filter buttons

Maintaining Data in an Excel Table

As you develop a worksheet with an Excel table, you may need to:

- Add new records to the table (either in the first blank row or by inserting a row within the table for the new record)
- Find and edit existing records in the table
- Delete records from the table

You can manually scroll through the table to find a specific record or a quicker way to locate a record is to use the **Find** command. When using the **Find** or **Replace** command, it is best to start at the top of a worksheet to ensure that all cells in the table are searched. There are three ways to delete records:

- Select a cell in each record you want to delete, click the Delete button arrow in the Cells group on the HOME tab, and then click Delete Table Rows
- Delete a field by selecting a cell in the field you want to delete, clicking the Delete button arrow, and then clicking Delete Table Columns
- Use the Remove Duplicates dialog box to locate and remove records that have the same data in selected columns

Sorting Data

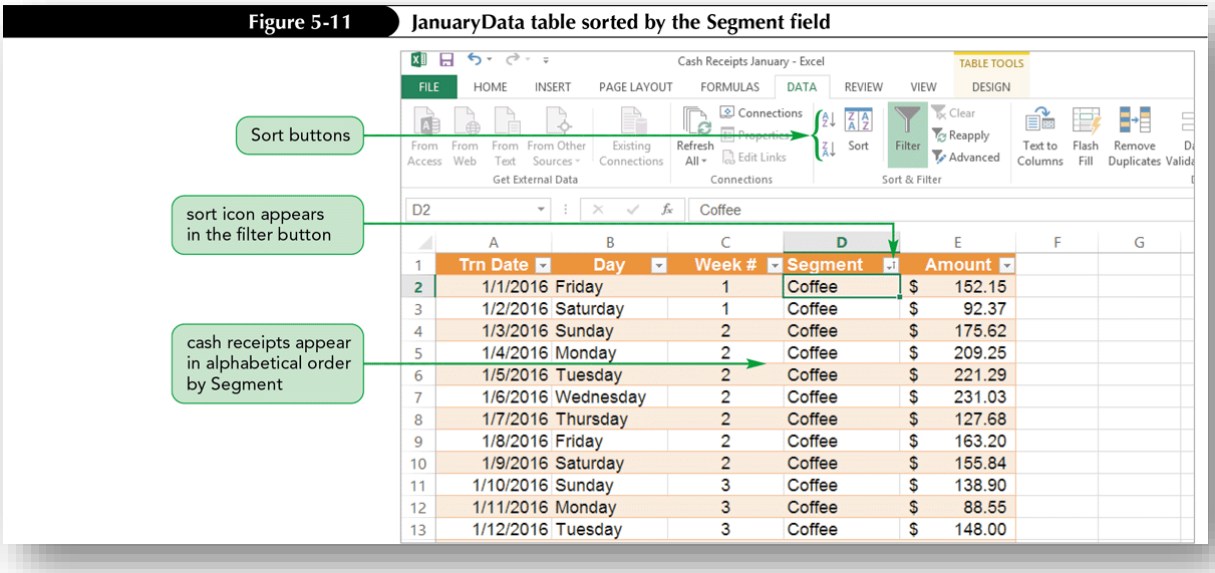
As you work, you might want to view your data in a different order. Ascending order arranges text alphabetically from A to Z, numbers from smallest to largest, and dates from oldest to newest. Descending order arranges text in reverse alphabetical order from Z to A, numbers from largest to

smallest, and dates from newest to oldest. You can also quickly sort data with sort fields. See examples below:

Sorting One Column Using the Sort Buttons

- Use the Sort A to Z button or the Sort Z to A button to sort data quickly with one sort field


Figure 5-11 JanuaryData table sorted by the Segment field



	A	B	C	D	E
1	Trn Date	Day	Week #	Segment	Amount
2	1/1/2016	Friday	1	Coffee	$ 152.15
3	1/2/2016	Saturday	1	Coffee	$ 92.37
4	1/3/2016	Sunday	2	Coffee	$ 175.62
5	1/4/2016	Monday	2	Coffee	$ 209.25
6	1/5/2016	Tuesday	2	Coffee	$ 221.29
7	1/6/2016	Wednesday	2	Coffee	$ 231.03
8	1/7/2016	Thursday	2	Coffee	$ 127.68
9	1/8/2016	Friday	2	Coffee	$ 163.20
10	1/9/2016	Saturday	2	Coffee	$ 155.84
11	1/10/2016	Sunday	3	Coffee	$ 138.90
12	1/11/2016	Monday	3	Coffee	$ 88.55
13	1/12/2016	Tuesday	3	Coffee	$ 148.00

Sorting Multiple Columns Using the Sort Dialog Box

- The first sort field is called the **primary sort field**
- The second sort is called the **secondary sort field**
- Up to 64 sort fields possible

Figure 5-12 Sort dialog box with three sort fields

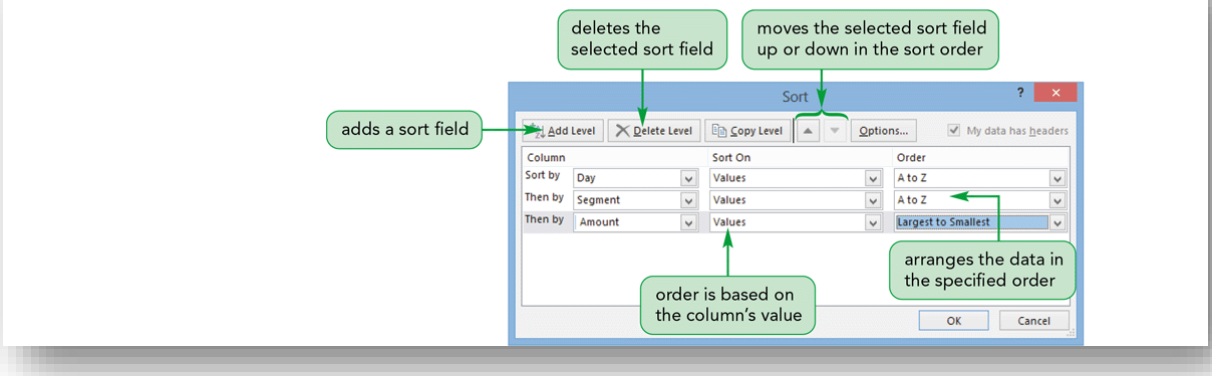
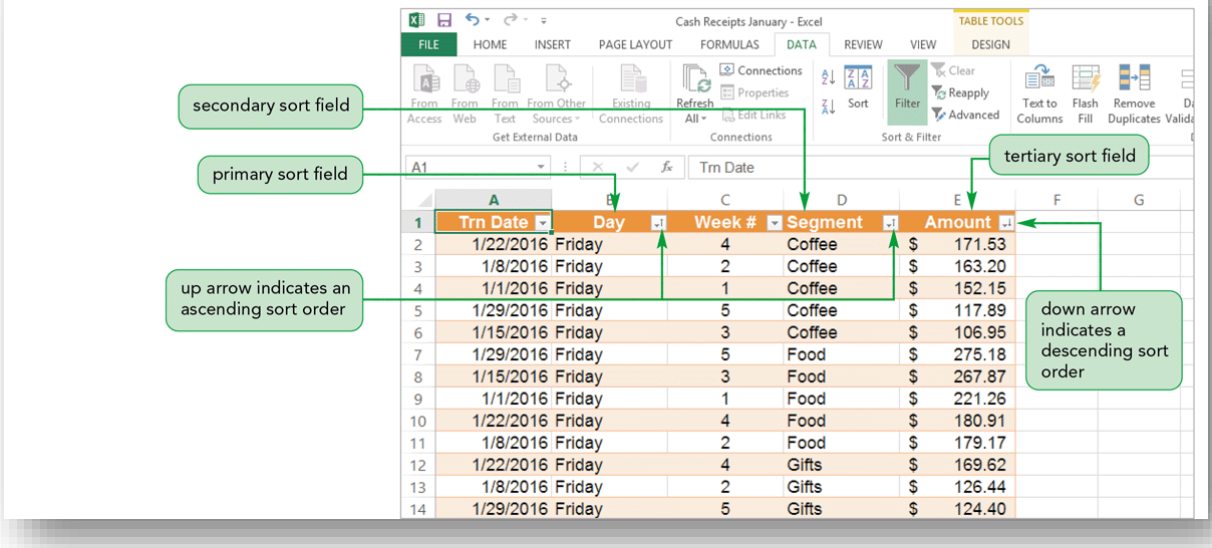


Figure 5-13 Cash receipts sorted by Day, then by Segment, and then by Amount

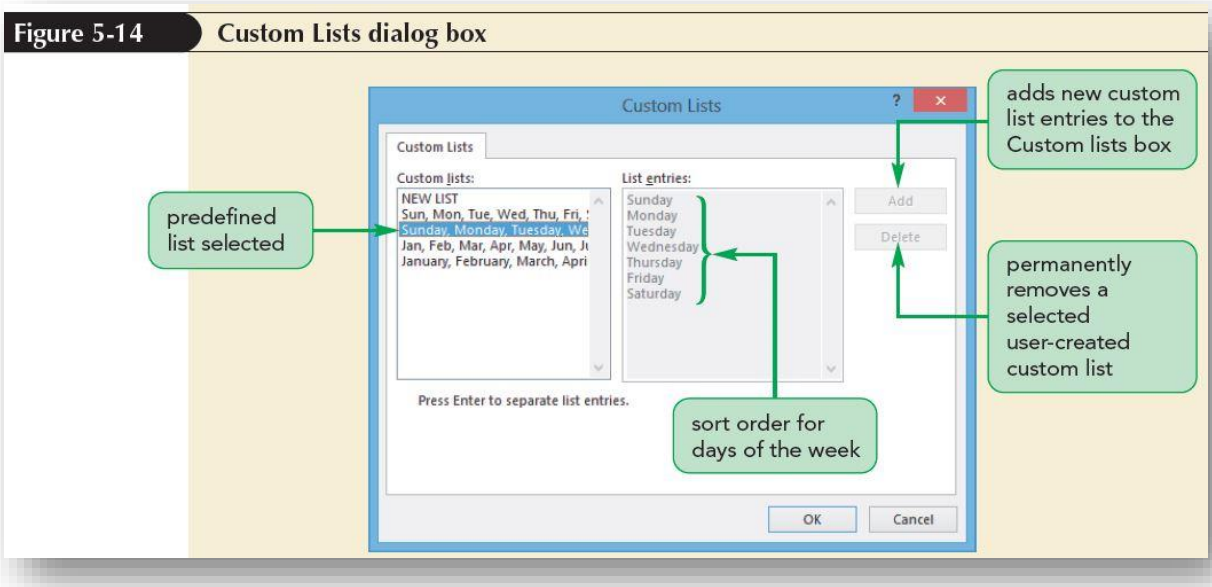


By using a Custom list in Excel, you can sort data in a given sequence or order. For example, you can sort by the day of the week or month of the year. These are two predefined lists in Excel:

- day-of-the-week (Sun,Mon,Tues, …and Sunday, Monday, Tuesday, …)
- month-of-the-year (Jan,Feb,Mar, …. And January, February, March, ….)

Figure below shows the Custom Lists dialogue box in Excel:

Figure 5-14 Custom Lists dialog box



Filtering Data

Another useful feature of Excel is the Filter function. This temporarily hides any records that do not meet specified criteria so that you only see that data that matches some criteria. After filtering the data, it can also be:

- Sorted
- Copied
- Formatted
- Charted
- Printed

See Module 5 for details on the filtering operations on data in Excel

- Filtering Using One Column
- Filtering Using Multiple Columns
- Clearing Filters
- Selecting Multiple Filter Items
- Creating Criteria Filters to Specify More Complex Criteria

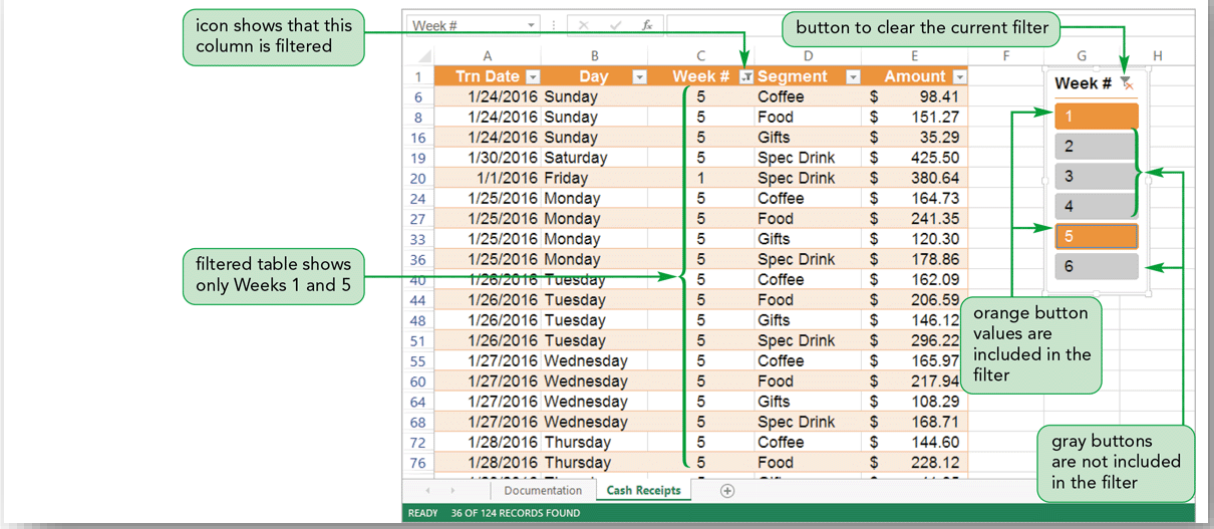
A **Criteria filter** is another useful feature of Excel. It enables you to specify various conditions in addition to those that are based on an “equals” criterion. The types of criteria filters available change depending on whether the data in a column contains text, numbers, or dates. The following figure shows the types of criteria that can be used.

Figure 5-18 Options for text, number, and date criteria filters

Filter	Criteria	Records Displayed
Text	Equals	Exactly match the specified text
	Does Not Equal	Do not exactly match the specified text
	Begins With	Begin with the specified text
	Ends With	End with the specified text
	Contains	Have the specified text anywhere
	Does Not Contain	Do not have the specified text anywhere
Number	Equals	Exactly match the specified number
	Greater Than or Equal to	Are greater than or equal to the specified number
	Less Than	Are less than the specified number
	Between	Are greater than or equal to *and* less than or equal to the specified numbers
	Top 10	Are the top or bottom 10 (or the specified number)
	Above Average	Are greater than the average
Date	Today	Have the current date
	Last Week	Are in the prior week
	Next Month	Are in the month following the current month
	Last Quarter	Are in the previous quarter of the year (quarters defined as Jan, Feb, Mar; Apr, May, June; and so on)
	Year to Date	Are since January 1 of the current year to the current date
	Last Year	Are in the previous year (based on the current date)

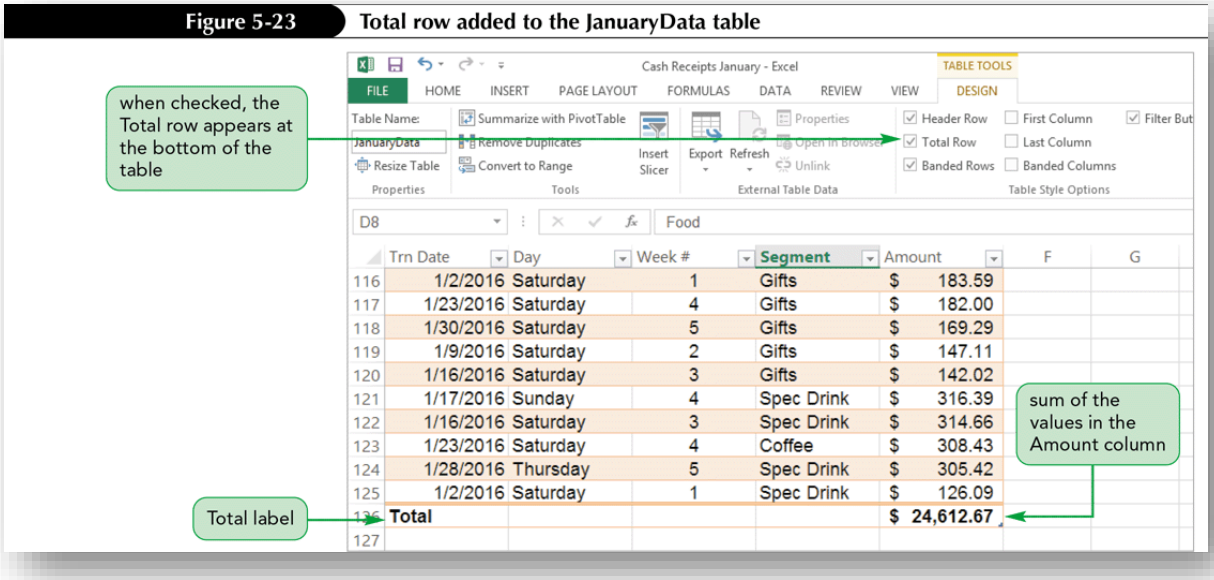
Another way to filter data is to use a slicer for any field in the Excel table. You can create one or more slicers to filter a table. Every slicer consists of an object that contains a button for each unique value in that field. An advantage of a slicer is that it clearly shows what filters are currently applied. However, it can take up a lot of space or hide data if there isn't a big enough blank area near the table. You can format the slicer and its buttons by changing its style, height, and width. An example of a slicer is given below:

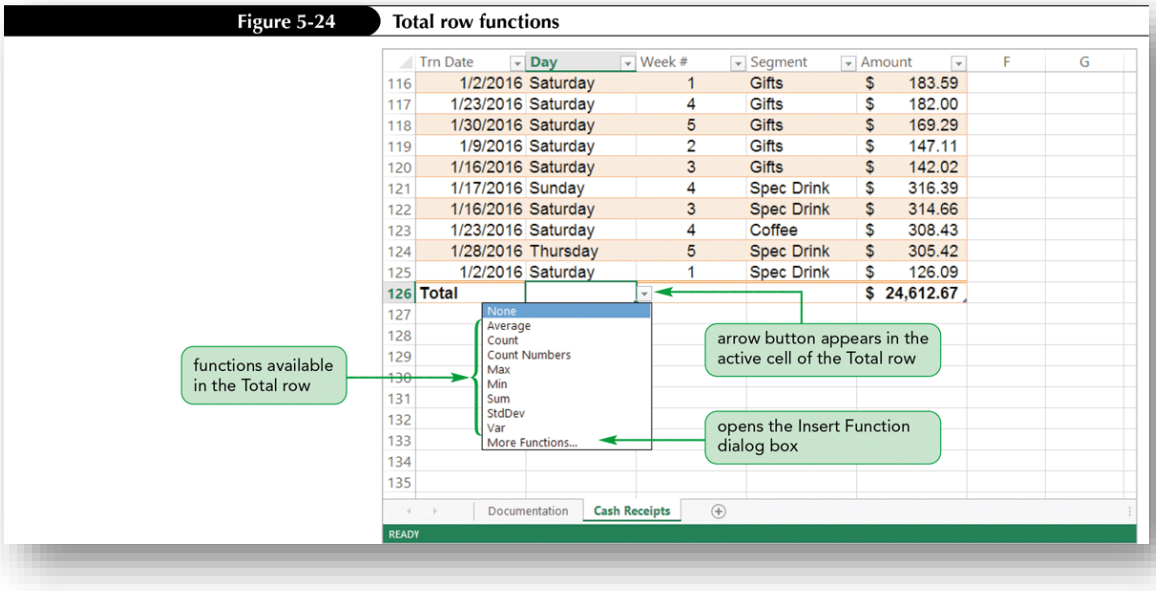
Figure 5-22 JanuaryData table filtered to show Weeks 1 and 5



You can calculate summary statistics such as the sum, average, count, maximum, and minimum values for any column in a table. Some examples are shown below:

Figure 5-23 Total row added to the JanuaryData table





Inserting Subtotals

The subtotal command offers many kinds of summary information (counts, sums, averages, minimums, maximums). For instance you might want to Inserts a subtotal row into range for each group of data and/or adds a grand total row below last row of the data. However subtotals cannot be used in an Excel table. Instead you must first convert the Excel table to a normal range. You also need to sort the data so that records with the same value in a specified field are grouped together *before* using Subtotal command. See Page 292 Module 5 of textbook.

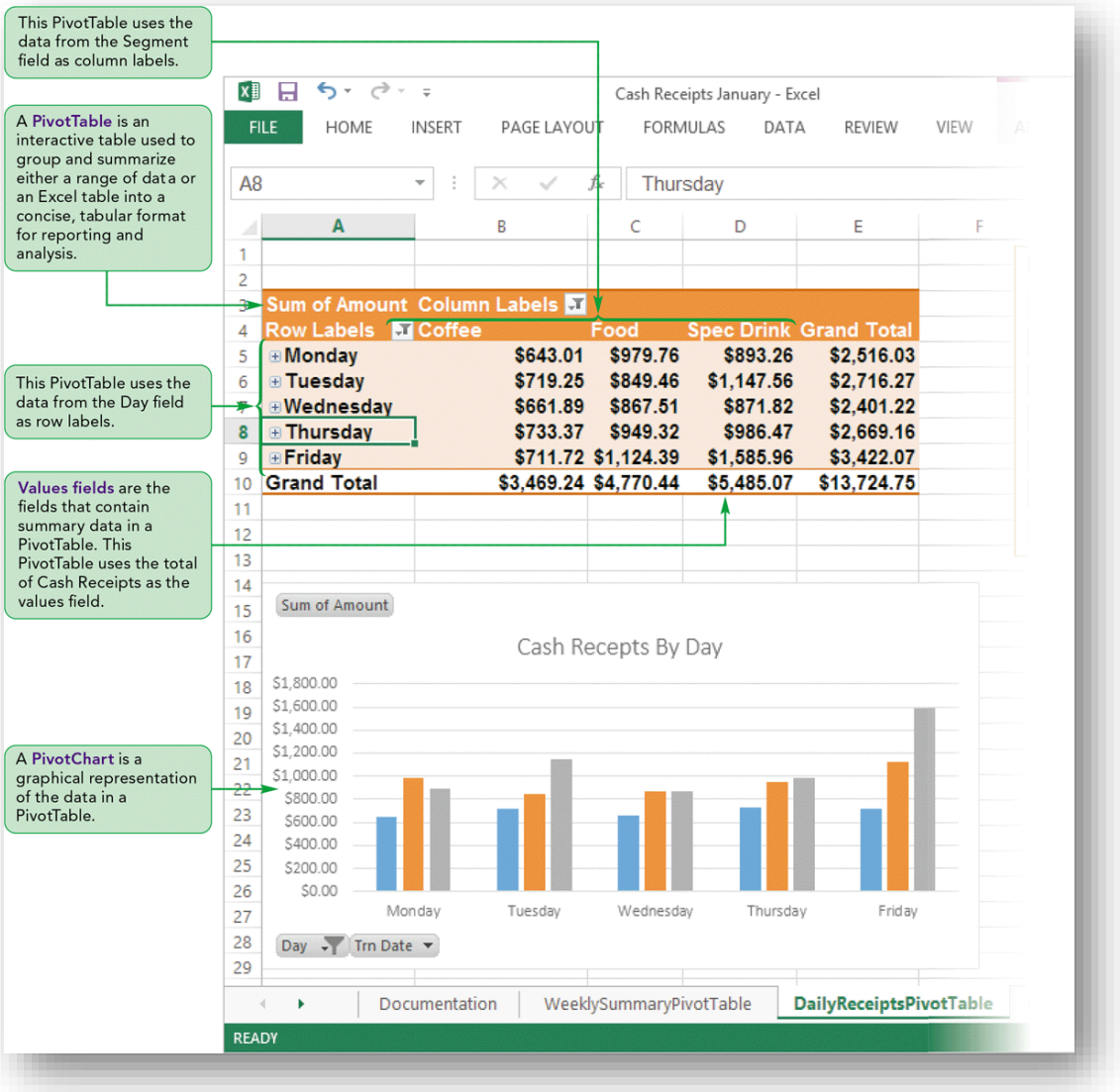
For more on Excel Tables see link:

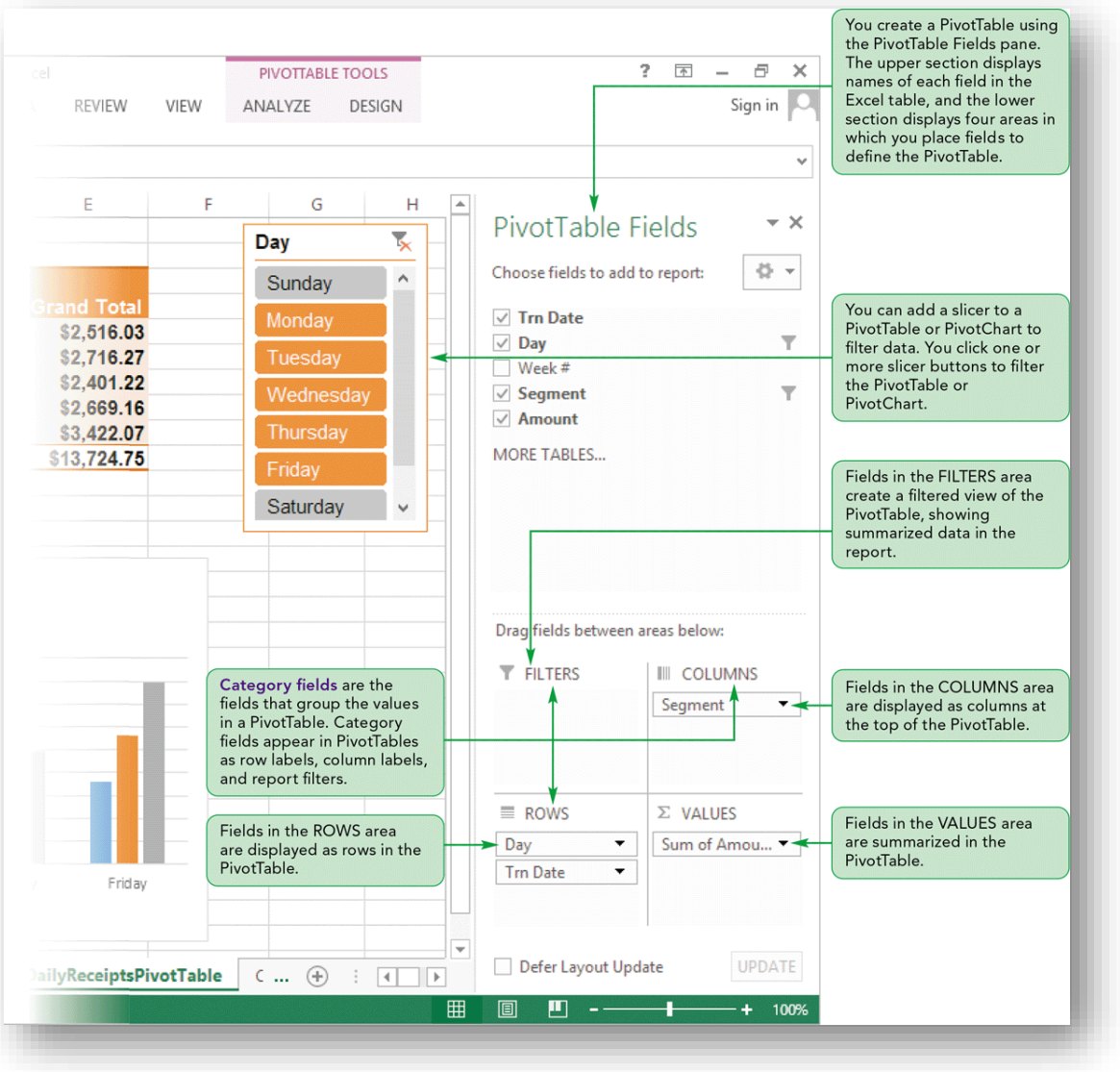
https://support.office.com/en-us/article/overview-of-excel-tables-7ab0bb7d-3a9e-4b56-a3c9-6c94334e492c

3. Create and modify a PivotTable

When a table contains large amounts of data, it often becomes difficult to obtain a clear view of that information. A pivot table is another way to summarise and analyse data. It can be quickly adjusted to display data in different ways. It groups data into categories, uses functions such as COUNT, SUM, AVERAGE, MAX, MIN to summarise data. It provides the ability to "pivot" the table i.e. rearrange, hide, and display different category fields to provide alternative views of the data.

Example of a PivotTable

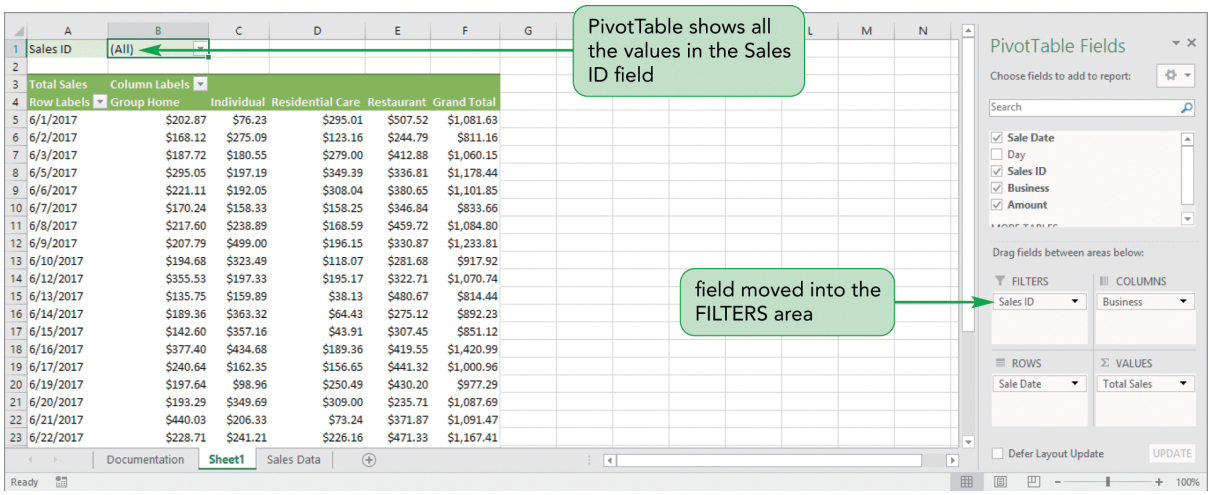




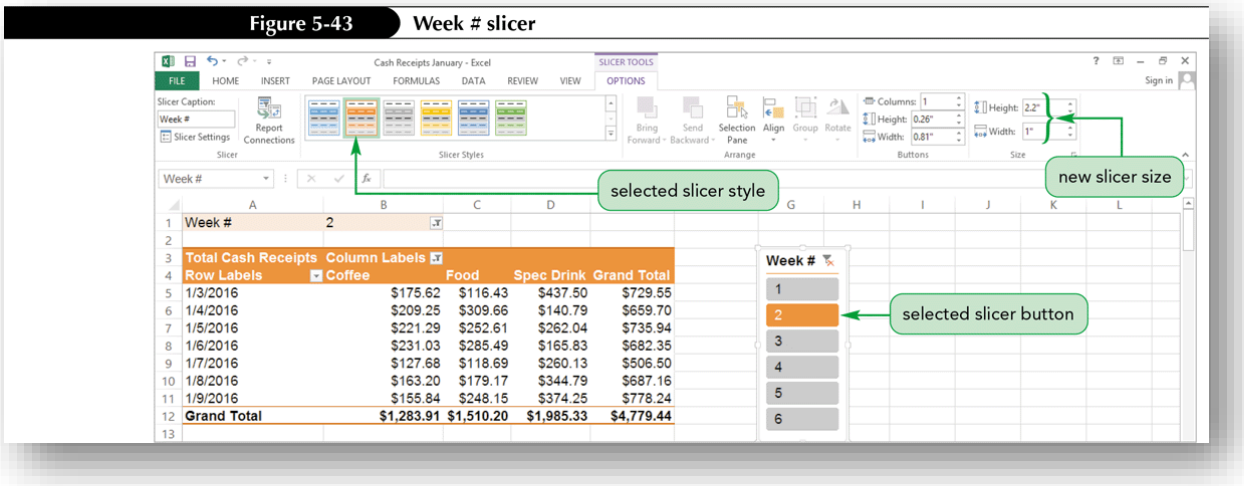
Before you create a PivotTable, you should plan its layout. An example is given below:

Sales ID	XXXX					
Total Sales						
Sale Date		Group Home	Individual	Residential Care	Restaurant	Total
Total						

See Ex300, Module 5 of the textbook on how to create a PivotTable. Like the Excel Table, you can also filter data in the PivotTable. See Figure below for the FILTERS area:



Similarly, you can create a slicer to filter data in a PivotTable. Figure below shows a PivotTable with a slicer.

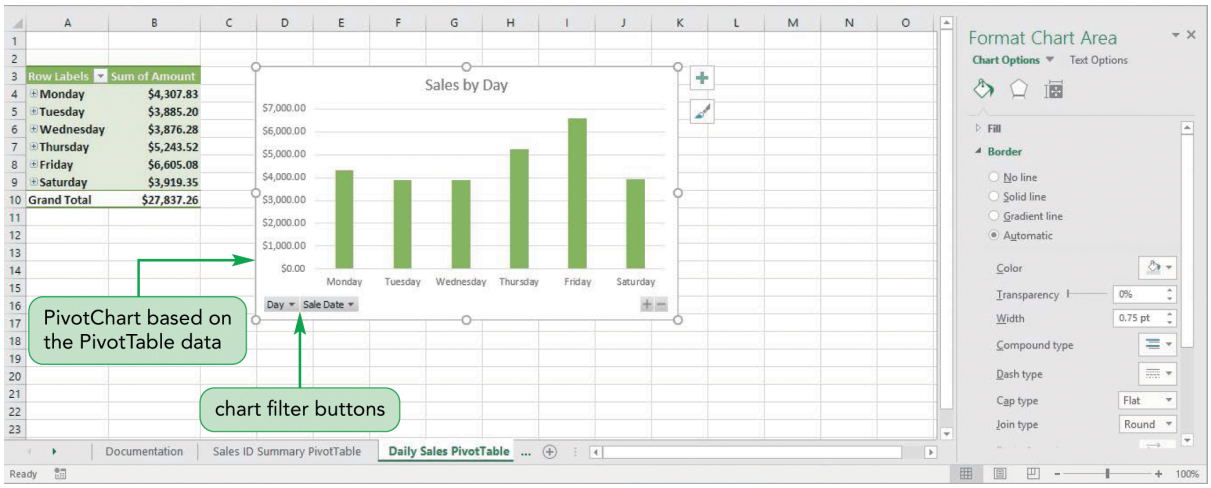


As the data in a PivotTable is only a temporary view of your data, you cannot change data directly in a PivotTable. Instead you must edit the data source on which the PivotTable is created. PivotTables are not updated automatically when the source data for the PivotTable is updated. After you edit the underlying data, you must refresh, or update, the PivotTable report to reflect the revised calculations.

4. Creating a PivotChart

A PivotChart is a graphical representation of the data in a PivotTable. It allows you to interactively add, remove, filter, and refresh data fields. PivotCharts can have all the same formatting as other charts, including layouts and styles. You can also move and resize chart elements, or change formatting of individual data points. A PivotChart and its associated PivotTable are linked; when you modify one, the other also changes. You can also quickly display different views of the PivotChart by using the chart filter buttons on the PivotChart to filter the data.

Example of a PivotChart



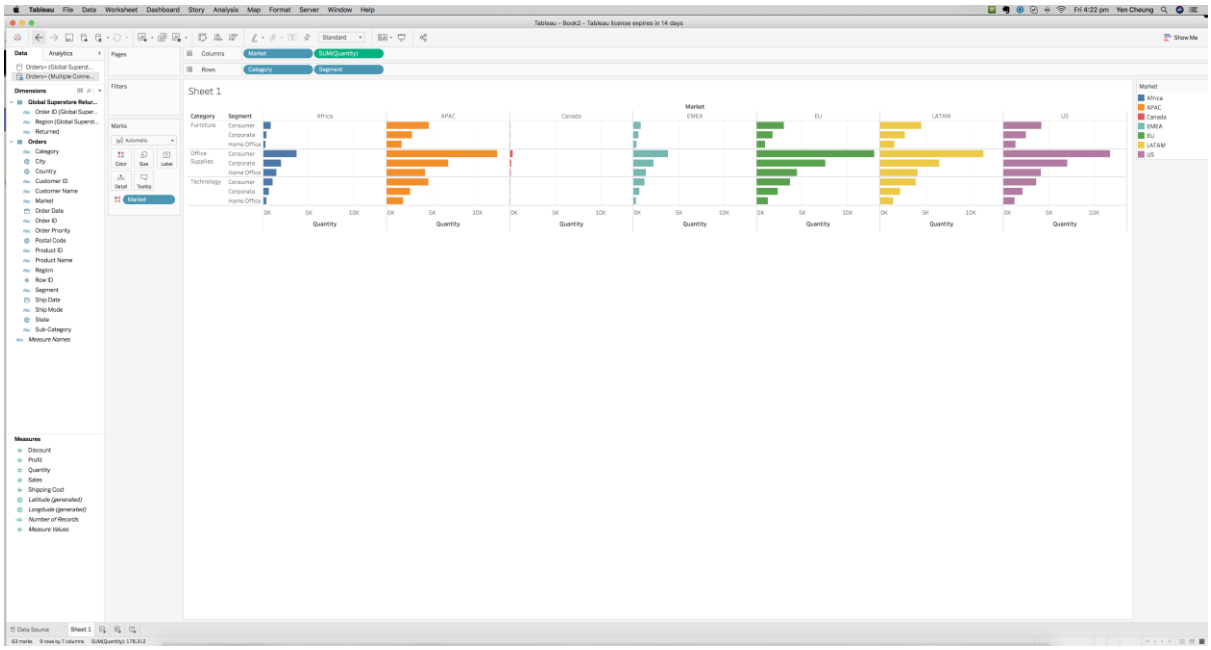
For more on Pivot Tables, see link:

https://support.office.com/en-us/article/create-a-pivottable-to-analyze-worksheet-data-a9a84538-bfe9-40a9-a8e9-f99134456576

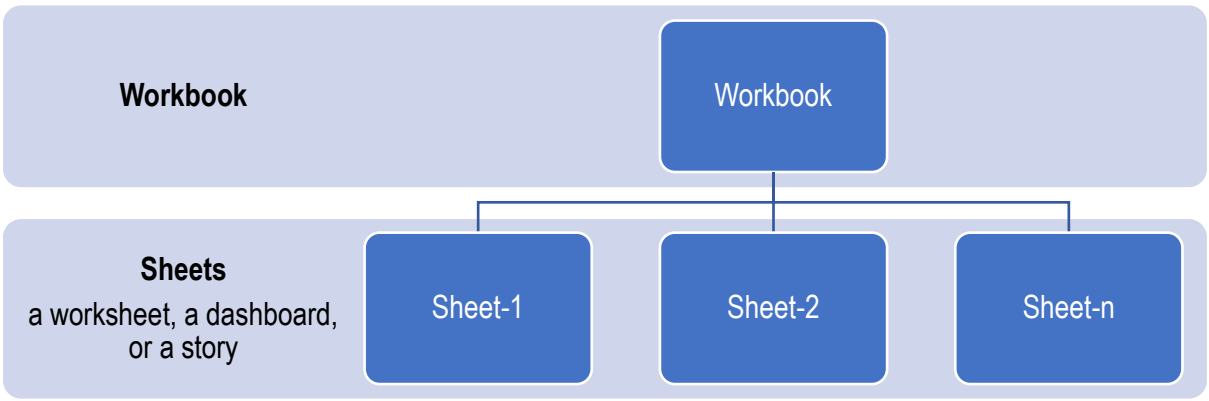
5. Data Visualization using Tableau

https://www.tableau.com/

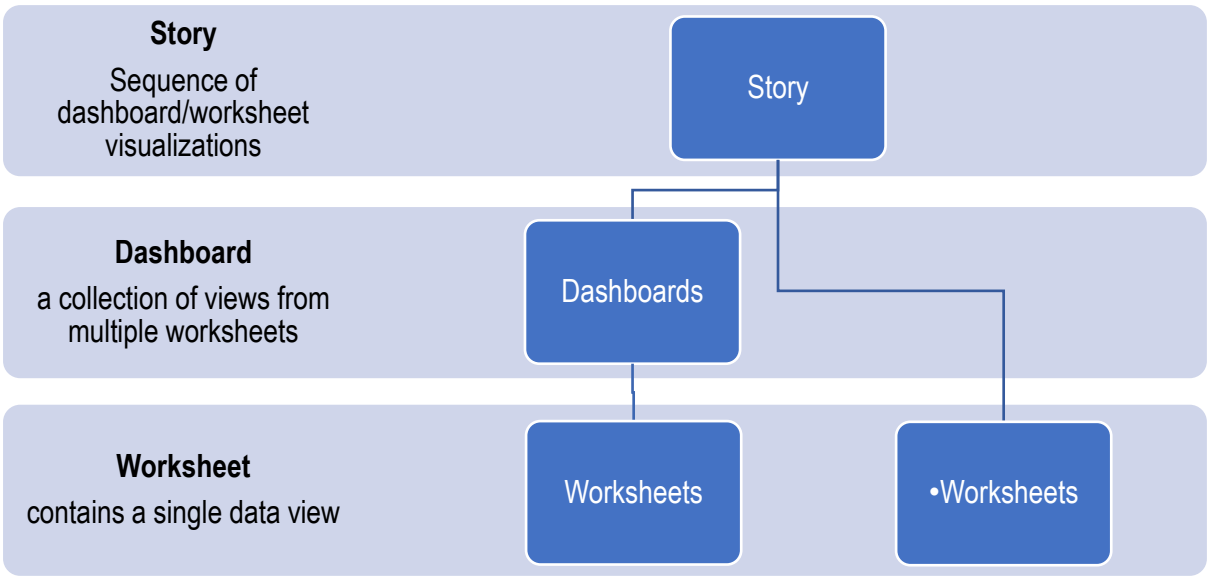
Using excel files, you can use the Tableau software to manipulate your data like the PivotTable in Excel. A data analytics platform, it allows much more data manipulation than Excel, online collaboration with live data and sophisticated dashboard and so on. The figure bellows shows the interface of the Tableau software.



Overview of Tableau workbook and sheets



Summary of Tableau core presentation components



For more on Tableau, see following links:

- Workbooks and sheets
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/environ_workbooksandsheets.html
- Getting started – Build a basic view to explore your data
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/gettingstarted_overview.html
- Building common chart types
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/dataview_examples.html
- Presentation in Dashboard and story
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/present.html
- Connecting Tableau to Excel
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/examples_excel.html
- Complete Tableau desktop help
  - https://onlinehelp.tableau.com/v2018.1/pro/desktop/en-us/default.html

6. Practice and Apply

1. Understanding how to create and modify an Excel Table
2. Understanding how to create and modify a PivotTable
3. Understanding how to apply PivotTable styles and formatting
4. Understanding how to filter in PivotTable
5. Understanding how to create a PivotChart
6. Discover how Tableau works
7. Complete all exercises in Tutorial 2