

# Data Analysis Tools: Format, Sorting, Sub-Totals and Pivot Tables

When working with these tools in Excel you refer to the data as a **Data Set**. The Data Set needs to be in a table.

A **Table** is defined by:

1. Field names at the top row (in each column).
2. Records - the data in each row, which describe one, item, person, etc.
3. There can be no blank rows or blank columns within the Data Set.
4. No alpha characters in the numbers area.
5. No adjacent data (there must be blank rows and columns bordering the Data Set).

**Table**

	A	B	C	D	E
1	Date	Company	Description	Amount	
2	1/4/2012	Costco	Micro SD	\$23.99	
3	1/10/2012	Costco	Turbo Tax	\$49.79	
4	1/19/2012	FedEx Office	Printing	\$100.66	
5	1/24/2012	Target	RCA dual DVD	\$59.00	
6	3/6/2012	Newegg	Hitachi Hard Drive	\$76.28	
7	4/1/2012	Sizzler	Dinner in Salem	\$11.99	
8	4/1/2012	Wilsonville Inn	Wilsonville Motel Rm	\$72.80	
9	4/2/2012	Chapala Mexican Restaurant	Lunch in Eugene	\$19.85	
10	5/4/2012	Costco	Ink jet refills	\$11.98	
11	7/20/2012	Costco	External HD	\$114.99	
12	8/23/2012	Costco	Batteries	\$15.49	
13	9/14/2012	Best Buy	Bluetooth Micro Adapter	\$19.99	
14	9/14/2012	Costco	Calendar Notebook	\$11.99	
15	9/14/2012	JK Computer Parts	Acer Aspire D150 Motherboard	\$37.00	
16	10/19/2012	Costco	Batteries	\$24.68	
17	12/5/2012	Costco	Lenswipes	\$11.18	
18	12/8/2012	Costco	Lenswipes	\$11.18	
19	12/9/2012	Amazon.com	MacBook Fan	\$8.28	
20	12/14/2012	Costco	Jabra Tour	\$69.99	
21	12/14/2012	Costco	USB flash drives	\$59.98	
22	12/17/2012	Best Buy	Mouse	\$24.95	
23	12/19/2012	Costco	Samsung Tab 7"	\$239.99	
24	12/23/2012	Home Depo		\$8.00	
25					

## Excel Table

You can convert a table (correct structure applied as above) to the Excel Table feature through the **Insert** tab and then **Table**. This feature includes a number of things.

- Dynamic Ranges – The range will automatically update when adding new records
- Automatic Sorting and Filtering – From the drop down arrows
- Automatic Formatting – Banding and colors
- Table Formula Nomenclature – Table Names and Field Names that insert into Formulas

## Formatting

What is seen in a cell is not necessarily, what Excel sees in the cell. This is known as the façade. As an example, Currency may be shown in the cell but it isn't in the formula bar.

### Numbers

An example of numbers formatted as currency but excel seeing them as just numbers (as shown in the formula bar) would be... \$660.00 would be 660 in the formula bar.

### Dates

Dates are shown in both the cell and the formula bar, but in the Excel background, they are really a number. That number is the number of days since 1/1/1900. You can see this by changing the date format to General format.

**Note:** the reason you may find this important is that you can use this to calculate things like past due date or maybe a loan term where the loan began on 1/1/10 and was to go for 45 days.

Date Format		General Format
1/1/1900	=	1
1/2/1900	=	2
10/9/2013	=	41556
12/8/2013	=	41616

### Time

Type the time 6:00 (space) am and it will change to 6:00 AM. Time is based on the percentage of a 24-hour day so 6:00 AM is actually .25. Also remember that to determine how many hours are worked... as an example use; (.675-.25)\*24=time worked

Description	Time		% Day
Time In	9:00 AM	=	.25
Time Out	4:30 PM	=	.6875
Proportion of Day Worked	10:30 AM	=	.4375 (.6875-.25)
Hours Worked	10.5		=(4:30 PM -9:00 AM)*24)

### Percentages

Be sure you use .04 (as an example) before choosing format %; not 4. Otherwise, you will get 400% (4\*100)

### Data Alignment

Knowing this will help to determine why sorting isn't working. As an example; Watch for numbers that are left aligned... they are actually text and formulas/functions will not see them as numbers, creating errors.

**Text** – Left

**Numbers** – Right

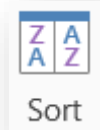
**True/False** - Center

## Sorting

The **Data** tab is one of the first places to look when attempting Data Analysis. Here you can easily begin with the sort function.

### Remember:

- Select only **one** cell in the Data Set; not multiple (a common mistake with users). Then click on Sort **A-Z** or **Z to A** and all cells in the table will be sorted by the **major sort field** (The field you selected the cell in.)
- If you want to sort multiple fields or sub-levels, remember that when you are using the click cell and sort method that the last field chosen must be the major sort field.
- If you want to use the Sort Wizard (shown right), then you must place the major sort field first and other levels underneath.
- The only time you want to highlight the whole column is if you are trying to remove records with blank cells. This will sort the blank ones to the bottom allowing you to remove those records.



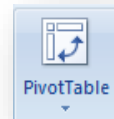
## Pivot Tables

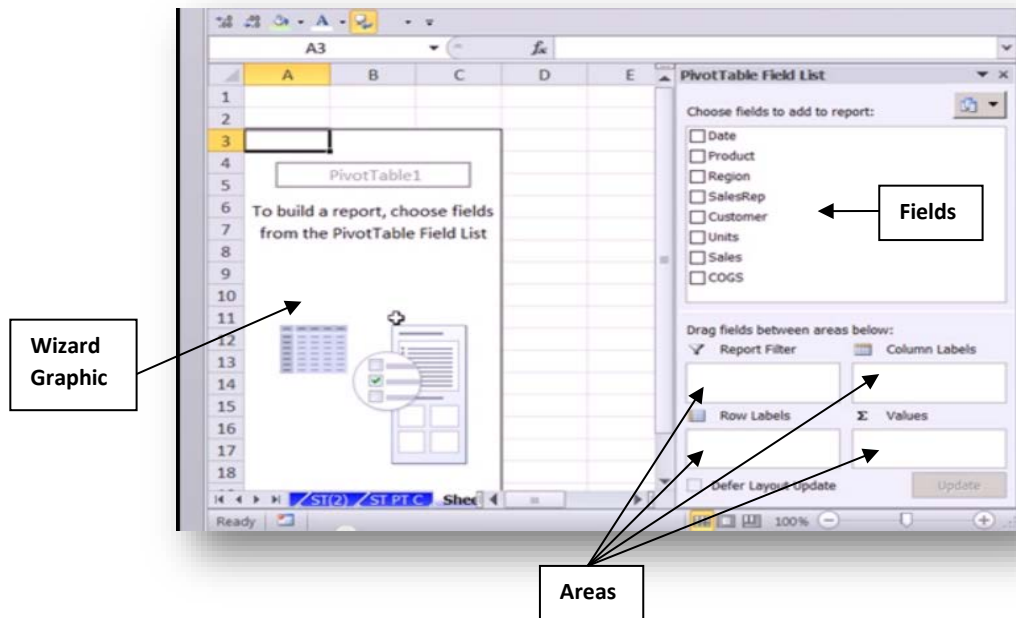
Pivot Tables are used to summarize and analyze vast amounts of data. Present data in easy to read tables and charts.

### Creation

Contrary to popular belief Pivot Tables are easy and can be quickly created by following the procedure below.

1. Visualize what you are trying to accomplish. It's all about Column Labels, Row Labels and Values.
2. Make sure your Data Set is in the right format as described on the first page of this document.
3. Click in only **one** cell of the Table
4. On the **Insert** Tab choose **Pivot Table** (icon shown right)
5. Then make sure the correct table area is chosen and select "Current Worksheet or "New worksheet for the location you want it to be created.
6. In the resulting screen, you can see the **Field List** that can be used to manipulate the data in the Pivot Table.





7. Drag and drop is the best way to move Fields to their appropriate areas. You can “pivot” any of these fields from one area to another simply by drag and drop, instantly updating your pivot table with new views.

Sum of Sales	Region	MidWest	South	West	Grand Total
SalesRep	East				
Denny		3721	1285	2040	4374
Hill		3693	3313	5766	2826
Simons		6818	2095	3029	1608
Stevenson		4943	3198	1953	9788
Thompson		1329	2303	4787	4166
Whipp		4397	3494	2227	2004
<b>Grand Total</b>		<b>24901</b>	<b>15688</b>	<b>19802</b>	<b>24766</b>

8. Your resulting pivot table (example above), will display the data with the “row labels” and “column labels” you chose. The values are displayed and can be re-formatted using a right-click and selecting “value field settings”. This allows you to add more cells to the table and have the value area automatically apply formatting.
9. From Contextual Tab – **PivotTable Tools**
  - a. Change the default format for the Field Names to “Show in Tabular Form”. Choose **Design** then **Report Layout / “Show in Tabular Form”**.
  - b. Totals and Sub-totals may be removed or added, using **Design / Subtotals** or **Grand Totals** Icons.
10. **Filtering** is easy using the dropdown arrows.

**Remember...** there is a reason they call these Pivot Tables. You can easily pivot your fields from one label or area to another, extracting a different summary of information.

## Pivot Table Tips and Tricks

- Grouping Dates** – Move your dates Field to the Row Label area and it will place the dates vertically. By using a right-click, you can choose **Group** and determine how you want the data to be grouped (by day, month, year or multiples of those).

The image shows two screenshots from an Excel PivotTable. The first screenshot shows the 'Grouping' dialog box with 'By' set to 'Days' and 'Starting at' and 'Ending at' dates. The second screenshot shows the resulting PivotTable with dates grouped into weekly intervals.

Row Labels	Keyboard	Laptop
1/1/13	432	
1/2/13	810	
1/3/13	460	722 483
1/4/13		
1/5/13		
1/6/13		
1/7/13		
1/8/13		
1/9/13		
1/10/13		
1/11/13		
1/12/13		
1/13/13		
1/14/13		
1/15/13		
1/16/13		
1/17/13		
1/18/13		
1/19/13		
1/20/13		
1/21/13		
1/22/13	667	

Sum of Sales	Column Labels	Keyboard	Laptop
1/1/2013 - 1/7/2013	2530	47	
1/8/2013 - 1/14/2013	4301	43	
1/15/2013 - 1/21/2013	4642	118	
1/22/2013 - 1/28/2013	2998	73	
1/29/2013 - 1/31/2013		9	
<b>Grand Total</b>	<b>14471</b>	<b>291</b>	

In the following example, I have chosen 7 days and the result is in the second capture indicating weekly spans. You can use a variety of groupings as shown in fig. 1.

- **Blank Cells in your Data Set** – If you have blank cells in your data and pull it to the Values area the resulting pivot table will change the formatting from SUM to COUNT. If this happens, you should know that you have a problem. If you still want the SUM just change it by going to “**value field settings**” and change it to **SUM**.
- **Report Filter** – You can add a field to the **Filter** Area and it will provide an easy way to look at one or multiple views of your data as shown below. It shows up above the table with a drop down for choosing your view.

Filter on the Product

	A	B	C	D	E	F
1	Product	(All)				
2						
3	Sum of Sales	Region				
4	SalesRep	East	MidWest	South	West	Grand Total
5	Denny	\$3,721.00	\$1,285.00	\$2,040.00	\$4,374.00	\$11,420.00
6	Hill	\$3,693.00	\$3,313.00	\$5,766.00	\$3,345.00	\$16,117.00
7	Simons	\$6,818.00	\$2,095.00	\$3,029.00	\$1,608.00	\$13,550.00
8	Stevenson	\$4,943.00	\$3,198.00	\$1,953.00	\$9,788.00	\$19,882.00
9	Thompson	\$1,329.00	\$1,808.00	\$4,787.00	\$4,166.00	\$12,090.00
10	Whipp	\$4,397.00	\$3,494.00	\$2,227.00	\$2,004.00	\$12,122.00
11	Grand Total	\$24,901.00	\$15,193.00	\$19,802.00	\$25,285.00	\$85,181.00
12						

- **Make Pages from the Report Filter** – Instantaneously create pages with your report filter. Choose Options from the contextual tab and then “**Show Report Filter Pages**”. It will create one page for each of the products in this case.
- **Using the Show Values As Tab** – This tab is part of the Value Field Settings Dialog box and can provide great analytical features to your pivot table. In the example below, I dragged the Sales total to the Value area twice, generating a Sum of Sales and Sum of Sales2. I then used the Show Values As by using the dropdown (highlighted in blue) to give % of column totals for each salesman’s sales.

I could also have used it to rank them, get counts or totals, etc.

Row Labels	Sum of Sales	Sum of Sales2
Denny	11420	13.41%
Hill	15598	18.32%
Simons	13550	15.91%
Stevenson	19882	23.35%
Thompson	12585	14.78%
Whipp		
Grand Total		

Value Field Settings ? x

Source Name: Sales

Custom Name: Sum of Sales2

Summarize Values By: Show Values As

**Show values as**

% of Column Total

Base field: Date, Product, Region, SalesRep, Customer, Units

Base item:

Number Format OK Cancel



