



# Excel 2016: Large Data 2 PivotTables





### Excel 2016: Large Data 2 - PivotTables 1.5 hours

PivotTables are very powerful summary reports created from an organized data set. In this workshop we will learn to plan and create PivotTables; work with grouping, filters, and summary options; create a PivotChart; and explore formatting options. This advanced workshop assumes prior experience with Microsoft Excel.

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#### **PivotTables**

PivotTables are summary reports. They give you the ability to take a large boring set of repetitive data and summarize it into a neat table that you can very easily rearrange, filter, format, and even chart.

1	A	В	С	D	E F	G		Н	1	J	K	L	M	Ν	0	Р	Q	R	S	T
1	Quarter	item	Size	Color	# Sold															
2	1st Quarter	Blouses	Large	Blue	88							Avg Sold								
3	1st Quarter	Blouses	Large	Red	10			Quarters	T,											
4	1st Quarter	Blouses	Large	White	92	Items	w	1st Quarter	2nd Quarte	r Grand Total										
5	1st Quarter	Blouses	Medium	Blue	23	Blouses		466	479	945					-					
6	1st Quarter	Blouses	Medium	Red	78	Pants		496	595	1091								_		
7	1st Quarter	Blouses	Medium	White	25	Socks		540	461	1001										Color =
8	1st Quarter	Blouses	Small	Blue	50	Grand T	otal	1502	1535	3037										
9	1st Quarter	Blouses	Small	Red	58															= Blue
10	1st Quarter	Blouses	Small	White	42	Avg Sole	d l													Red .
11	1st Quarter	Pants	Large	Blue	15			Blue	Red	White	Grand Total									White
12	1st Quarter	Pants	Large	Red	85	Blouses		47.9	60.8	44.5	51.1									
13	1st Quarter	Pants	Large	White	75	Pants		68.7	51.3	52.1	57.3									-
14	1st Quarter	Pants	Medium	Blue	63	Socks		53.2	59.4	58.7	57.1	_								-
15	1st Quarter	Pants	Medium	Red	17	Grand T	otal	56.6	57.2	51.8	55.2		BLOU	SES	PAI	NTS		5	OCKS	
16	1st Quarter	Pants	Medium	White	64							item w								
17	1st Quarter	Pants	Small	Blue	89							inerit -								
18	1st Quarter	Pants	Small	Red	27															
19	1st Quarter	Pants	Small	White	61	Sum of #	Sold													
20	1st Quarter	Socks	Large	Blue	83			Large			Large Total	Medium			Medium Total	Small			Small Total	Grand Total
21	1st Quarter	Socks	Large	Red	45			Blue	Red	White		Blue	Red	White		Blue	Red	White		
22	1st Quarter	Socks	Large	White	43	1st Quart	er	186	140	210	536	112	171	153	436	231	180	119	530	1502
23	1st Quarter	Socks	Medium	Blue	26	Blouses	5	88	10	92	190	23	78	25	126	50	58	42	150	466
24	1st Quarter	Socks	Medium	Red	76	Pants		15	85	75	175	63	17	64	144	89	27	61	177	496
25	1st Quarter	Socks	Medium	White	64	Socks		83	45	43	171	26	76	64	166	92	95	16	203	540
26	1st Quarter	Socks	Small	Blue	92	2nd Quar	ter	118	101	146	365	156	225	101	482	183	276	229	688	1535
27	1st Quarter	Socks	Small	Red	95	Blouses	5	12	40	35	87	41	96	34	171	53	82	86	221	479
28	1st Quarter	Socks	Small	White	16	Pants		73	25	16	114	97	81	24	202	91	96	92	279	595
29	2nd Quarter	Blouses	Large	Blue	12	Socks		33	36	95	164	18	48	43	109	39	98	51	188	461
30	2nd Quarter	Blouses	Large	Red	40	3rd Quart	er	217	135	174	526	178	112	181	471	188	251	97	536	1533
31	2nd Quarter	Blouses	L arne	White	35	Blourse		73	75	23	171	94	56	84	234	47	91	19	157	562
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32	2nd Quarter	Blouses	Medium	Blue	41	Pants		82	44	81	207	48	31	76	155	85	95	13	193	555
32 33	2nd Quarter 2nd Quarter 2nd Quarter	Blouses Blouses	Medium Medium	Blue Red	41 96	Pants Socks		82 62	44	81 70	207 148	48 36	31 25	76 21	155 82	85 56	95 65	13 65	193 186	555 416
32 33 34	2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter	Blouses Blouses Blouses	Medium Medium Medium	Blue Red White	41 96 34	Pants Socks 4th Quart	ter	82 62 150	44 16 159	81 70 130	207 148 <b>439</b>	48 36 <b>145</b>	31 25 <b>121</b>	76 21 <b>146</b>	155 82 <b>412</b>	85 56 173	95 65 <b>187</b>	13 65 177	193 186 537	555 416 1388
32 33 34 35	2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter	Blouses Blouses Blouses Blouses	Medium Medium Medium Small	Blue Red White Blue	41 96 34 53	Pants Socks 4th Quart Blouses	ter	82 62 <b>150</b> 20	44 16 <b>159</b> 46	81 70 130 12	207 148 439 78	48 36 145 36	31 25 <b>121</b> 19	76 21 <b>146</b> 35	155 82 412 90	85 56 173 38	95 65 <b>187</b> 79	13 65 <b>177</b> 47	193 186 537 164	555 416 1388 332
32 33 34 35 36	2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter 2nd Quarter	Blouses Blouses Blouses Blouses Blouses	Medium Medium Medium Small Small	Blue Red White Blue Red	41 96 34 53 82	Pants Socks 4th Quart Blouses Pants	ter 5	82 62 <b>150</b> 20 82	44 16 <b>159</b> 46 40	81 70 130 12 49	207 148 439 78 171	48 36 145 36 19	31 25 <b>121</b> 19 25	76 21 146 35 16	155 82 412 90 60	85 56 173 38 80	95 65 <b>187</b> 79 49	13 65 <b>177</b> 47 58	193 186 537 164 187	555 416 1388 332 418
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Here's an example of a repetitive raw data set, three PivotTables, and a PivotChart.

#### Planning

The most important part of building a PivotTable is planning. You have to remove yourself from the raw data and think about the final result. There's a learning curve, have patience with yourself and with Excel and you'll get there.

#### <u>The Data</u>

**The data has to be repetitive**. It looks wrong at first, but the more boring and repetitive your data, the more you can do with it. In the Large Data 1 class we learn about sorting and filtering in Excel. We don't need to keep each quarter, each department, each person on a different sheet. If we keep all of the data in the same place, we can look at each category, one at a time, using the filter, and beautifully because it is all in the same place, we can look across categories and quickly summarize with a PivotTable.

**The data has to be consistent**. We don't want to see entries like: 4th Qtr, 4th Quarter, Qtr 4. In the Large Data 3 (vLookups) class we'll learn about validation rules, and in Large Data 4 (report) we'll see how to use vLookups to help us cleanup inconsistent data entry.

The definition of a database is a structured collection of related data. Rows of a data table are <u>records</u>. When we filter in Excel, the Status Bar tells us how many Records were found.

Columns of a data table are <u>fields</u>. The column titles of your original dataset will appear in the PivotTable Field List. You'll use these titles to control the structure of the PivotTable. If possible, **use clear, concise, and unique column titles**. If you use the same column title more than once, Excel will add a number after the subsequent titles. Example: *Home Address, City, State, Zip, Work Address, City, State, Zip* becomes *Home Address, City, State, Zip, Work Address, City(2), State(2), Zip(2).* 

#### The Result

By all means, jump in and play with the tools, get comfortable with how to make a PivotTable. But when it comes down to needing a specific report, you have to "show your work". Think about what it is you actually want to see.

"I want to know how many items we ordered." Okay. Do you care what the items were? Do you care about the data across the year, or do you only want the total? What about the other details? Each versus boxes? Would you like to compare your orders to another departments?

"I want to know how many patients were admitted last month." Okay. Do you want to see the break down by time, perhaps by morning and afternoon? By shift? By Department? Or would you like to have the flexibility to change (filter) the shifts and departments?

The more you think about what you want out of the glorious summary report known as a PivotTable, the better it will come together for you.

#### Building

Quarter

The PivotTable field list shows the column titles of our original dataset, these are our **Fields**. If you rename, add, or delete columns in the dataset you will not see the change here until you refresh the data. The **Refresh** button is on the Analyze tab of the PivotTable Tools, and can be found on the shortcut menu if you right-click inside the table.

- Fields in the Filters will appear above the table.
- Fields in the **Columns** will appear at the top of each column of the PivotTable.
- Fields in the **Rows** will appear at the left of each row of the PivotTable.
- Fields in the **Values** will be summarized. By default, text and date fields will be counted, number fields will be summed.

1st Quarter 📲

Sum of # Sold				
Blue		Red	White	Grand Total
Blouses	161	146	159	466
Large	88	10	92	190
Medium	23	78	25	126
Small	50	58	42	150
🗏 Pants	167	129	200	496
Large	15	85	75	175
Medium	63	17	64	144
Small	89	27	61	177
Socks	201	216	123	540
Large	83	45	43	171
Medium	26	76	64	166
Small	92	95	16	203
Grand Total	529	491	482	1502

Choose fields to add to report:							
Search		5					
Quarter		3					
✓ item							
✓ Size							
✓ Color							
✓ # Sold							
✓ # Sold MORE TABLES							
✓ # Sold MORE TABLES							
✓ # Sold MORE TABLES Drag fields betweer	areas below:						
✓ # Sold MORE TABLES Drag fields betweer ▼ FILTERS	areas below:						
<ul> <li># Sold</li> <li>MORE TABLES</li> <li>Drag fields betweer</li> <li>FILTERS</li> <li>Quarter</li> </ul>	areas below: COLUMNS Color	Ţ					
# Sold MORE TABLES Drag fields betweer FILTERS Quarter ROWS	areas below:  Columns  Color  Σ VALUES	•					
<ul> <li># Sold</li> <li>MORE TABLES</li> <li>Drag fields betweer</li> <li>T FILTERS</li> <li>Quarter</li> <li>ROWS</li> <li>item</li> </ul>	areas below:	-					

#### Arranging Fields

#### Adding

- Click the check box in front of the field name
  - Text fields will go into the Rows showing each unique value from the dataset
  - Date fields will go into the Rows grouping the values across time
  - Number fields will go into the Value as a sum
- Drag fieldname from the field list to an area
  - You will *have* to drag to add a field to the value area multiple times
- Right-click on the fieldname in the field list and choose an area

#### Moving

- Drag fieldname from an area to a new area
- Right-click on the fieldname in the field list and choose a new area
- Left-click on a field in an area and choose a new area

#### **Deleting**

- Drag fieldname out of the area section
- Left-click on a field in the area and choose Remove Field

#### Value Field Settings

Fields added to the value section are summarized within the grouping of the row and column headings set in the PivotTable. Numbers will sum, other values will be counted. To change how the data is summarized, left-click on the fieldname in the Values area and choose **Value Field Settings**.

You can reformat your numbers with the Excel formatting tools, but if you reformat from the Value Field Settings window you'll format the Table, this means if you change the structure of your table by adding fields you won't have to reformat any new cells occupied by the table.

#### Page 7 of this handout discusses the Show Values As options.

stom Name: Sum of	# Sold	
Summarize Values By	Show Values As	
Summarize value field	i by	
data from the selected	field	
Count	200	
Average		
May		
Max Min		
Max Min Product		

It is possible to create other summary options, but it's beyond the scope of this class. If you would like to explore, look at the **Fields**, **Items, & Sets** option on the Analyze tab.

Field	$\int x$	f <sub>x</sub>	Relationships	Pi					
& Sets -		Tools -							
	Calculat	ted <u>F</u> ielo	d						
	Calculat	ted <u>I</u> tem	1						
	<u>S</u> olve O	rder							
Ξ <i>f</i> <sub>x</sub>	<u>L</u> ist Formulas								
	Create Set Based on <u>R</u> ow Items								
	Create S	Set Base	ed on <u>C</u> olumn It	ten					
	<u>M</u> anage	e Sets							

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