

VIIH Create Pivot Tables using Excel 2008 1

Creating Pivot Tables Using Excel 2008, 2010 or 2013

by
Milo Schield

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*Slides and Demo output at: www.StatLit.org/pdf/Create-Pivot-Tables-Excel-2008-6up.pdf
[pdf/Create-Pivot-Tables-using-Excel-Demo.pdf](http://www.StatLit.org/pdf/Create-Pivot-Tables-using-Excel-Demo.pdf)*

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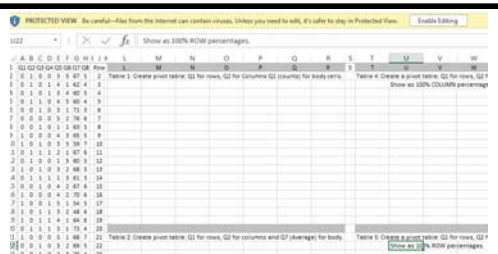
The Goal

Goal: to show the steps involved in creating six different kinds of pivot tables from the same data set. Creating each of the tables starts with steps A-D (shown on the following slides).

Table 1: Two-way count table (slides 9-11)
 Table 2: Two-way table of averages (slides 12-13)
 Table 3: Two-group table of statistics (slides 14-16)
 Table 4: 100% Column Table (slides 17-19)
 Table 5: 100% Row Table (slides 20-21)
 Table 6: Two-way table of percentages (slides 22-23)

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A: Open/Download Data File; Press 'Enable Editing' button



Excel data at:
www.statlit.org/XLS/Create-Pivot-Tables-using-Excel-Data.xls

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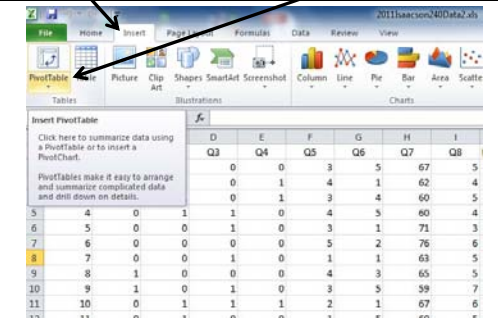
Create Excel Pivot Tables from this data: A1:H241

Data for Q1-Q4 (A-D) is Binary: 0=No, 1=Yes.
 Data for Q5-Q6 (E-F) is Ordinal (discrete): 1-5.
 Data for Q7-Q8 (G-H) is Quantitative (ratio).

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Row			L	M
2	0	1	0	0	3	5	67	5	2	Table 1: Create pivot table			
3	0	1	0	1	4	1	62	4	3				
4	0	1	0	1	3	4	60	5	4				
5	0	1	1	0	4	5	60	4	5				
6	0	0	1	0	3	1	71	3	6				

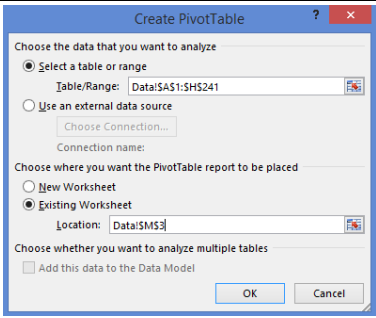
VIIH Create Pivot Tables using Excel 2008 5

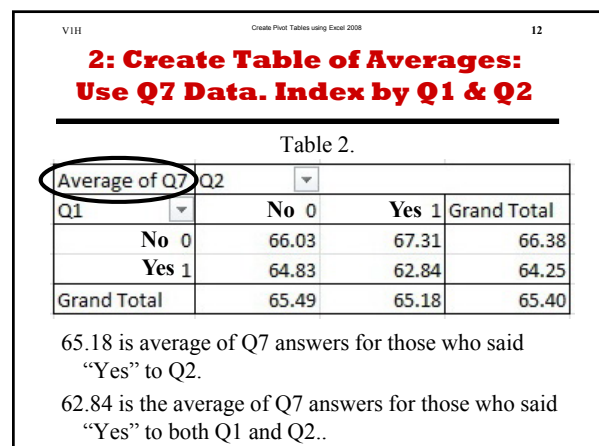
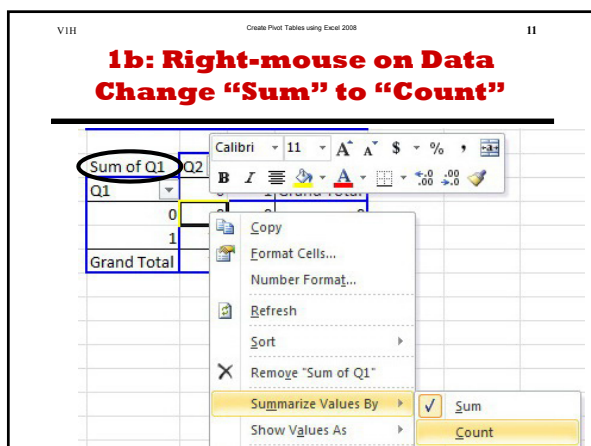
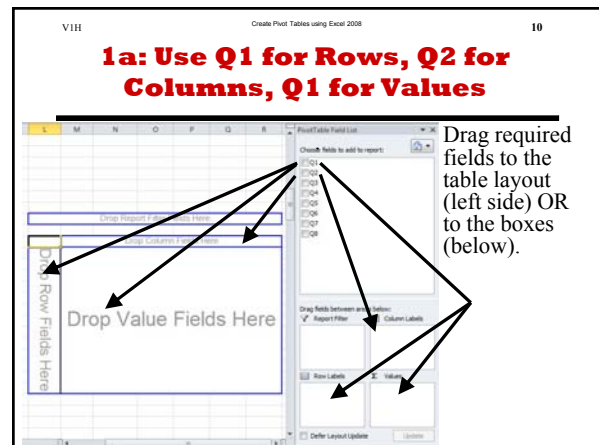
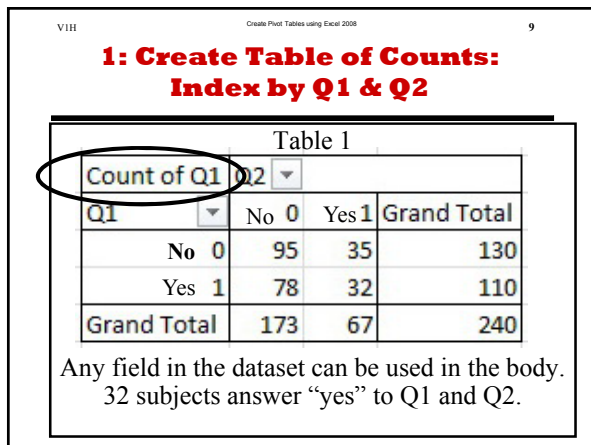
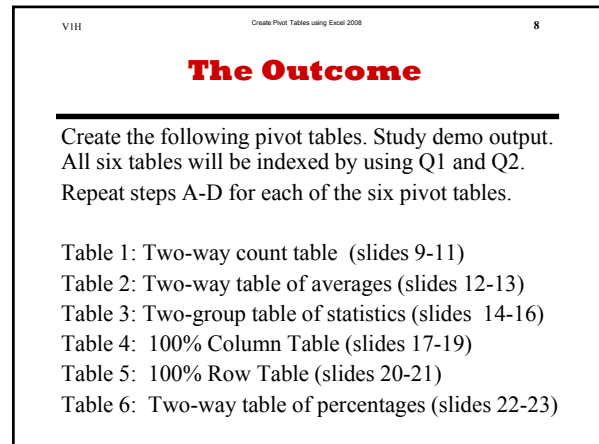
B: From the Insert ribbon, Select "Pivot Table"



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C: In Wizard, Select 'Table/Range' and 'Location'





2a: Drag data fields as needed; Change "Sum" to "Average"

3: Create 3 Statistics for Q7; Index by Q1 & Q2

Q1	Q2		Grand Total
	0	1	
Data	66.03	67.31	66.38
Average of Q7	95.00	35.00	130.00
Count of Q7	11.86	10.05	11.38
StdDev of Q7	64.83	62.84	64.25
1 Average of Q7	78.00	32.00	110.00
Count of Q7	12.48	11.62	12.21
StdDev of Q7	65.49	65.18	65.40
Total Average of Q7	173.00	67.00	240.00
Total Count of Q7	12.12	10.98	11.79
Total StdDev of Q7			

65.40 is average of Q7 for all respondents.
64.25 is average of Q7 for those who said Yes to Q1.

3a: Drag Q1 to Rows; Q2 to Cols. Drag Q7 three times to Values

Q1	Q2		Grand Total
	0	1	
Sum of Q7	6273	2356	8629
Sum of Q7_2	6273	2356	8629
Sum of Q7_3	6273	2356	8629
1 Sum of Q7	5057	2011	7068
Sum of Q7_2	5057	2011	7068
Sum of Q7_3	5057	2011	7068
Total Sum of Q7	11330	4367	15697
Total Sum of Q7_2	11330	4367	15697
Total Sum of Q7_3	11330	4367	15697

If problem dragging Q7 third time to same place, drag to different place Values may stack horizontally. Cause unknown. Acceptable.

3b: Change Show Values to Average, Count and StdDev.

Q1	Q2	
	0	1
Average of Q7	66.03157895	67.31428571
Count of Q7_2		
Sum of Q7_3		
1 Average of Q7		
Count of Q7_2		
Sum of Q7_3		
Total Average of Q7		
Total Count of Q7_2		
Total Sum of Q7_3		

Right-mouse Q7; change to Average.; Right-mouse Q7_2; change to Count. Right-mouse Q7_3; change to StdDev.

4: Create 100% Column Table; Index on Q1 and Q2.

Table 4.

Count of Q2	Q2		
Q1	No 0	Yes 1	Grand Total
No 0	54.91%	52.24%	54.17%
Yes 1	45.09%	47.76%	45.83%
Grand Total	100.00%	100.00%	

45.83% of all respondents said "Yes" to Q1.
47.76% of those who said Yes to Q2 said Yes to Q1.

4a: Double-click on Data Field; Select Count in 'Summarize by'

4b: Select "Show Values as" Select "% of Column Total"

The screenshot shows a PivotTable with 'Count of Q2' as the value field. The 'Show Values As' menu is open, and '% of Column Total' is selected. The PivotTable shows counts for 'No' (0) and 'Yes' (1) across 'Q1' categories (0 and 1).

5: Create 100% Row Table; Index on Q1 and Q2.

Table 5.

Count of Q2	Q2			
Q1	No	Yes	Grand Total	
No	0	73.08%	26.92%	100.00%
Yes	1	70.91%	29.09%	100.00%
Grand Total		72.08%	27.92%	100.00%

27.92% of all respondents said "yes" to Q2.
 29.09% of those saying yes to Q1 said Yes to Q1.
 The first step for Table 5 is the same as 4a for Table 4.

5a: Select "Show Values as"; Select "% of Row Total"

The screenshot shows the same PivotTable as in slide 4b, but with '% of Row Total' selected in the 'Show Values As' menu. The values in the table are percentages.

6: Create two-way table of Q3; Index by Q1 and Q2.

Table 6.

Average of Q3	Q2			
Q1	No	Yes	Grand Total	
No	0	81%	71%	78%
Yes	1	37%	34%	36%
Grand Total		61%	54%	59%

59% of respondents said Yes to Q3.
 36% of those who said Yes to Q1 said Yes to Q3.
 Of those who said Yes to Q1, 36% said Yes to Q3.

6a: Change Sum to Average; Format data as Percentages

The screenshot shows the 'Value Field Settings' dialog box for 'Sum of Q3'. The 'Source Name' is 'Q3', the 'Custom Name' is 'Average of Q3', and 'Show Values As' is set to 'Percentages of Row Total'. The 'Summarize value field by' is set to 'Average'.

Conclusion

Pivot tables are one of the more powerful features of Excel.
 Knowing how to create pivot tables is a *valuable skill*.
 Knowing which is the better table is a *more valuable skill*.
 Knowing how to read, interpret and communicate the data summarized in pivot tables is a *most valuable skill*.

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The Goal

Goal: to show the steps involved in creating six different kinds of pivot tables from the same data set.

Creating each of the tables starts with steps A-D (shown on the following slides).

Table 1: Two-way count table (slides 9-11)

Table 2: Two-way table of averages (slides 12-13)

Table 3: Two-group table of statistics (slides 14-16)

Table 4: 100% Column Table (slides 17-19)

Table 5: 100% Row Table (slides 20-21)

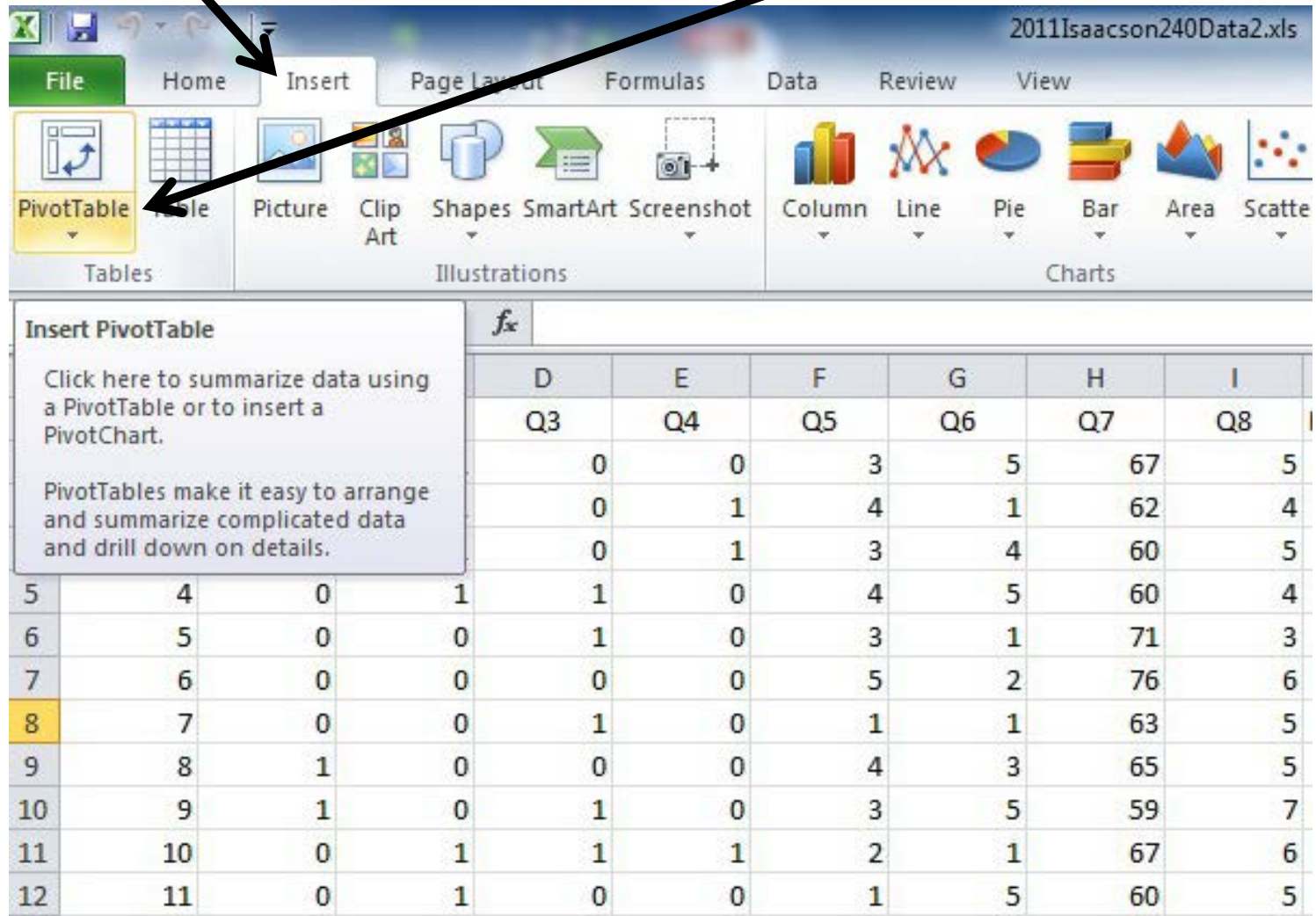
Table 6: Two-way table of percentages (slides 22-23)

Create Excel Pivot Tables from this data: A1:H241

Data for Q1-Q4 (A-D) is Binary: 0=No, 1=Yes.
 Data for Q5-Q6 (E-F) is Ordinal (discrete): 1-5.
 Data for Q7-Q8 (G-H) is Quantitative (ratio).

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Row			L	M
2	0	1	0	0	3	5	67	5	2	Table 1: Create pivot table			
3	0	1	0	1	4	1	62	4	3				
4	0	1	0	1	3	4	60	5	4				
5	0	1	1	0	4	5	60	4	5				
6	0	0	1	0	3	1	71	3	6				

B: From the Insert ribbon, Select “Pivot Table”



2011Isaacson240Data2.xls

File Home **Insert** Page Layout Formulas Data Review View

PivotTable Table Picture Clip Art Shapes SmartArt Screenshot Column Line Pie Bar Area Scatter

Tables Illustrations Charts

Insert PivotTable

Click here to summarize data using a PivotTable or to insert a PivotChart.

PivotTables make it easy to arrange and summarize complicated data and drill down on details.

	D	E	F	G	H	I			
	Q3	Q4	Q5	Q6	Q7	Q8			
5	4	0	1	1	0	4	5	67	5
6	5	0	0	1	0	3	1	62	4
7	6	0	0	0	0	5	2	76	6
8	7	0	0	1	0	1	1	63	5
9	8	1	0	0	0	4	3	65	5
10	9	1	0	1	0	3	5	59	7
11	10	0	1	1	1	2	1	67	6
12	11	0	1	0	0	1	5	60	5

C: In Wizard, Select 'Table/Range' and 'Location'

Choose the data that you want to analyze

Select a table or range

Table/Range: Data!\$A\$1:\$H\$241

Use an external data source

Choose Connection...

Connection name:

Choose where you want the PivotTable report to be placed

New Worksheet

Existing Worksheet

Location: Data!\$M\$3

Choose whether you want to analyze multiple tables

Add this data to the Data Model

OK Cancel

D: Table Layout shows Field List

The screenshot displays an Excel spreadsheet with columns L through R. A PivotTable layout is shown with four designated areas for field placement:

- Drop Report Filter Fields Here:** A horizontal box at the top of the PivotTable area.
- Drop Column Fields Here:** A horizontal box below the filter area.
- Drop Row Fields Here:** A vertical box on the left side of the PivotTable area.
- Drop Value Fields Here:** A large central box for the data values.

The PivotTable Field List task pane is open on the right side of the screen. It contains the following elements:

- PivotTable Field List** (Title bar)
- Choose fields to add to report:** A list of fields (Q1 through Q8) with checkboxes next to them.
- Drag fields between areas below:** Four designated areas for field placement:
 - Report Filter:** Represented by a funnel icon.
 - Column Labels:** Represented by a grid icon.
 - Row Labels:** Represented by a grid icon.
 - Values:** Represented by a sigma symbol (Σ).
- Defer Layout Update:** A checkbox at the bottom left.
- Update:** A button at the bottom right.

The Outcome

Create the following pivot tables. Study demo output. All six tables will be indexed by using Q1 and Q2. Repeat steps A-D for each of the six pivot tables.

Table 1: Two-way count table (slides 9-11)

Table 2: Two-way table of averages (slides 12-13)

Table 3: Two-group table of statistics (slides 14-16)

Table 4: 100% Column Table (slides 17-19)

Table 5: 100% Row Table (slides 20-21)

Table 6: Two-way table of percentages (slides 22-23)

1: Create Table of Counts: Index by Q1 & Q2

Table 1

Count of Q1		Q2		
Q1		No	Yes	Grand Total
No	0	95	35	130
Yes	1	78	32	110
Grand Total		173	67	240

Any field in the dataset can be used in the body.
32 subjects answer “yes” to Q1 and Q2.

1a: Use Q1 for Rows, Q2 for Columns, Q1 for Values

The screenshot shows the PivotTable Field List task pane on the right side of an Excel spreadsheet. The task pane has a list of fields (Q1 through Q8) with checkboxes. Below the list are four boxes for 'Report Filter', 'Column Labels', 'Row Labels', and 'Values'. At the bottom, there is a 'Defer Layout Update' checkbox and an 'Update' button. On the left side of the spreadsheet, there are four blue-outlined boxes: 'Drop Report Filter Fields Here' (top), 'Drop Column Fields Here' (second from top), 'Drop Row Fields Here' (third from top, oriented vertically), and 'Drop Value Fields Here' (bottom). Black arrows point from the 'Q1' checkbox in the task pane to the 'Drop Row Fields Here' box, from the 'Q2' checkbox to the 'Drop Column Fields Here' box, and from the 'Q1' checkbox to the 'Drop Value Fields Here' box. Another arrow points from the 'Report Filter' box in the task pane to the 'Drop Report Filter Fields Here' box.

Drag required fields to the table layout (left side) OR to the boxes (below).

1b: Right-mouse on Data Change “Sum” to “Count”

The screenshot shows an Excel PivotTable with the following data:

Q1	Q2
0	
1	
Grand Total	

The context menu is open over the 'Sum of Q1' cell. The menu items are:

- Copy
- Format Cells...
- Number Format...
- Refresh
- Sort
- Remove "Sum of Q1"
- Summarize Values By** (highlighted)
- Show Values As

The 'Summarize Values By' sub-menu is open, showing the following options:

- Sum
- Count** (highlighted)

2: Create Table of Averages: Use Q7 Data. Index by Q1 & Q2

Table 2.

Average of Q7		Q2		
Q1		No 0	Yes 1	Grand Total
No 0		66.03	67.31	66.38
Yes 1		64.83	62.84	64.25
Grand Total		65.49	65.18	65.40

65.18 is average of Q7 answers for those who said “Yes” to Q2.

62.84 is the average of Q7 answers for those who said “Yes” to both Q1 and Q2..

2a: Drag data fields as needed; Change “Sum” to “Average”

The screenshot shows an Excel PivotTable with a PivotTable Field List on the right. The PivotTable is set to show the sum of Q7, filtered by Q2, with Q1 as the row label. The Value Field Settings dialog box is open, showing the source name 'Q7' and a custom name 'Average of Q7'. The 'Summarize Values By' tab is selected, and the 'Average' option is chosen in the 'Summarize value field by' list.

Drop Report Filter Fields Here			
Sum of Q7	Q2		
Q1			Grand Total
0	6273	2356	8629
1	50		
Grand Total	113		

Value Field Settings

Source Name: Q7

Custom Name: Average of Q7

Summarize Values By: Show Values As

Summarize value field by

Choose the type of calculation that you want to use to summarize data from the selected field

- Sum
- Count
- Average
- Max
- Min
- Product

Number Format OK Cancel

PivotTable Field List:

- Report Filter: Q6, Q7, Q8
- Column Labels: Q2
- Row Labels: Q1
- Values: Sum of Q7

Defer Layout Update Update

3: Create 3 Statistics for Q7; Index by Q1 & Q2

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
40	0	1	0	1	2	1	74	6	40								
41	0	0	1	0	1	3	69	6	41	Table 3: Create pivot table: Q1 for rows, Q2 for columns and Q7 for data (body.)							
42	1	0	1	1	4	4	53	5	42	Show average, standard deviation and count for all cells.							
43	1	0	0	0	5	5	59	4	43	Horizontal or vertical layout is OK.							
44	1	1	1	1	3	2	66	6	44	Q2							
45	0	0	1	1	1	2	54	4	45	Q1	Data	No 0	Yes 1	Grand Total			
46	0	1	0	1	2	2	54	6	46	No	0	Average of Q7	66.03	67.31	66.38		
47	0	0	1	0	3	1	59	5	47		Count of Q7	95.00	35.00	130.00			
48	1	0	1	0	5	4	47	4	48		StdDev of Q7_2	11.86	10.05	11.38			
49	0	1	1	1	1	5	58	6	49	Yes	1	Average of Q7	64.83	62.84	64.25		
50	0	0	1	0	3	5	75	7	50		Count of Q7	78.00	32.00	110.00			
51	1	0	0	1	5	5	68	6	51		StdDev of Q7_2	12.48	11.62	12.21			
52	0	1	1	0	5	1	75	4	52	Total Average of Q7			65.49	65.18	65.40		
53	1	1	0	1	5	1	59	6	53	Total Count of Q7			173.00	67.00	240.00		
54	1	0	0	1	4	4	74	5	54	Total StdDev of Q7_2			12.12	10.98	11.79		

65.40 is average of Q7 for all respondents.

64.25 is average of Q7 for those who said Yes to Q1.

3a: Drag Q1 to Rows; Q2 to Cols. Drag Q7 *three times* to Values

Table 3: Create pivot table: Q1 for rows, Q2 for columns and Q7 for data (body.)					
Show average, standard deviation and count for all cells.					
Horizontal or vertical layout is OK.					
		Q2			
Q1	Data	0	1	Grand Total	
0	Sum of Q7	6273	2356	8629	
	Sum of Q7_2	6273	2356	8629	
	Sum of Q7_3	6273	2356	8629	
1	Sum of Q7	5057	2011	7068	
	Sum of Q7_2	5057	2011	7068	
	Sum of Q7_3	5057	2011	7068	
Total Sum of Q7		11330	4367	15697	
Total Sum of Q7_2		11330	4367	15697	
Total Sum of Q7_3		11330	4367	15697	

PivotTable Fields

Choose fields to add to report:

Q1
 Q2
 Q3
 Q4
 Q5
 Q6
 Q7
 Q8

Drag fields between areas below:

FILTERS **COLUMNS**

Q2

ROWS **VALUES**

Q1 Sum of Q7
Σ Values Sum of Q7_2
 Sum of Q7_3

If problem dragging Q7 third time to same place, drag to different place
 Values may stack horizontally. Cause unknown. Acceptable.

3b: Change Show Values to Average, Count and StdDev.

Right-mouse Q7; change to Average.; Right-mouse Q7_2; change to Count. Right-mouse Q7_3; change to StdDev.

		Q2	
Q1	Data	0	1
	0 Average of Q7	66.03157895	67.31428571
	Count of Q7_2		
	Sum of Q7_3		
	1 Average of Q7		
	Count of Q7_2		
	Sum of Q7_3		
Total Average of Q7			
Total Count of Q7_2			
Total Sum of Q7_3			

Value Field Settings

Source Name: Q7
 Custom Name: StdDev of Q7_3

Summarize Values By: Show Values As

Summarize value field by
 Choose the type of calculation that you want to use to summarize data from the selected field

- Product
- Count Numbers
- StdDev**
- StdDevp
- Var
- Varp

Number Format OK Cancel

Drag fields between areas below:

FILTERS	COLUMNS
	Q2
ROWS	VALUES
Q1	Average of Q7
Σ Values	Count of Q7_2
	Sum of Q7_3

4: Create 100% Column Table; Index on Q1 and Q2.

Table 4.

Count of Q2		Q2		
Q1		No 0	Yes 1	Grand Total
No 0		54.91%	52.24%	54.17%
Yes 1		45.09%	47.76%	45.83%
Grand Total		100.00%	100.00%	100.00%

45.83% of all respondents said “Yes” to Q1.

47.76% of those who said Yes to Q2 said Yes to Q1.

4a: Double-click on Data Field; Select Count in 'Summarize by'

The screenshot shows an Excel PivotTable with the following data:

Sum of Q2	Q2	
Q1	0	
0	0.00	35.00
1	0.00	32.00
Grand Total	0.00	67.00

The context menu for the data field is open, showing the following options:

- Copy
- Format Cells...
- Number Format...
- Refresh
- Sort
- Remove "Sum of Q2"
- Summarize Values By**
 - Sum
 - Count**
 - Average
 - Max
 - Min
 - Product
 - More Options...
- Show Values As
- Show Details
- Value Field Settings...
- PivotTable Options...
- Hide Field List

The PivotTable Field List on the right shows the following configuration:

- Report Filter: (empty)
- Column Labels: Q2
- Row Labels: Q1
- Values: Sum of Q2

The "Defer Layout Update" checkbox is unchecked, and the "Update" button is visible.

5: Create 100% Row Table; Index on Q1 and Q2.

Table 5.

Count of Q2		Q2		
Q1		No 0	Yes 1	Grand Total
	No 0	73.08%	26.92%	100.00%
	Yes 1	70.91%	29.09%	100.00%
	Grand Total	72.08%	27.92%	100.00%

27.92% of all respondents said “yes” to Q2.

29.09% of those saying yes to Q1 said Yes to Q1.

The first step for Table 5 is the same as 4a for Table 4.

5a: Select “Show Values as”; Select “% of Row Total”

Count of Q2	Q2	
Q1	0	54.91%
	1	45.09%
Grand Total		100.00%

The screenshot shows the 'Show Values As' context menu for a PivotTable. The menu options are:

- No Calculation
- % of Grand Total
- % of Column Total
- % of Row Total**
- % Of...
- % of Parent Row Total
- % of Parent Column Total
- % of Parent Total...
- Difference From...
- % Difference From...
- Running Total In...
- % Running Total In...

6: Create two-way table of Q3; Index by Q1 and Q2.

Table 6.

Average of Q3		Q2		
Q1		No 0	Yes 1	Grand Total
	No 0	81%	71%	78%
	Yes 1	37%	34%	36%
Grand Total		61%	54%	59%

59% of respondents said Yes to Q3.

36% of those who said Yes to Q1 said Yes to Q3.

Of those who said Yes to Q1, 36% said Yes to Q3.

6a: Change Sum to Average; Format data as Percentages

The screenshot shows an Excel PivotTable and the Value Field Settings dialog box. The PivotTable is located in columns K through N and rows 1 through 5. The dialog box is open over the PivotTable, showing the 'Value Field Settings' for the 'Q3' field. The 'Summarize value field by' dropdown is set to 'Average'. The 'Number Format' button is visible at the bottom of the dialog box.

Sum of Q3	Q2		
Q1	0	1	Grand Total
0	77	25	102
1	29	11	40
Grand Total	106	36	142

PivotTable Field List:

- Q1
- Q2
- Q3
- Q4
- Q5
- Q6
- Q7
- Q8

Value Field Settings:

Source Name: Q3
 Custom Name: Average of Q3

Summarize Values By: Show Values As

Summarize value field by

Choose the type of calculation that you want to use to summarize data from the selected field

- Sum
- Count
- Average**
- Max
- Min
- Product

Number Format OK Cancel

Conclusion

Pivot tables are one of the more powerful features of Excel.

Knowing how to create pivot tables is *a valuable skill*.

Knowing which is the better table is *a more valuable skill*

Knowing how to read, interpret and communicate the data summarized in pivot tables is *a most valuable skill*.