

X1D: VIN Create Pivot Tables using Excel 2013 1

## Creating Pivot Tables Using Excel 2013

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by  
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*Slides and Demo output at: [www.StatLit.org/pdf/Excel2013-Create-Pivot-Tables-Slides.pdf](http://www.StatLit.org/pdf/Excel2013-Create-Pivot-Tables-Slides.pdf)  
[pdf/Excel2103-Create-Pivot-Tables-Demo.pdf](http://www.StatLit.org/pdf/Excel2103-Create-Pivot-Tables-Demo.pdf)*

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## The Goal

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

Creating each of the six tables starts with steps B and C (slides 3 thru 6). Step D (slide 7) is basis for each table

Table 1: Two-way count table (slides 8-10)  
 Table 2: Two-way table of averages (slides 11-12)  
 Table 3: Two-group table of statistics (slides 13-16)  
 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

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Excel data at:  
[www.statlit.org/XLS/Excel2013-Create-Pivot-Tables-Data.xlsx](http://www.statlit.org/XLS/Excel2013-Create-Pivot-Tables-Data.xlsx)

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## Create Excel Pivot Tables from this data: A1:H241

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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).

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Row	K	L	M
0	1	0	0	3	5	67	5	2	Table 1: Insert pivot table at L6 (Not K6).		
0	1	0	1	4	1	62	4	3	Use Q1 for Values. Show Q1 values		
0	1	0	1	3	4	60	5	4	Optional: If headings not shown: Pivot Table To		
0	1	1	0	4	5	60	4	5			
0	0	1	0	3	1	71	3	6			

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

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## C: Select/Enter Range as A1:H241 Set 'Location' for each graph.

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Row	K	L	M	N	O
2	Table 1: Insert pivot table at L6 (Not K6). Use Q1 for rows, Q2 for Columns				
3	Use Q1 for Values. Show Q1 values				
4	Optional: If headings not shown: P				
5	Create PivotTable				
6	Choose the data that you want to analyze				
7	<input checked="" type="radio"/> Select a table or range				
8	Table/Range: Data!\$A\$1:\$H\$241				
9	<input type="radio"/> Use an external data source				
10	Choose Connection...				
11	Connection name:				
12	Choose where you want the PivotTable report				
13	<input type="radio"/> New Worksheet				
14	<input checked="" type="radio"/> Existing Worksheet				
15	Location: Data!\$L\$6				

**D: Table Layout w Field List: Build each table from this.**

**1a: Insert@L6. Use Q1 for Rows, Q2 for columns, Q1 for Values**

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

**1b: Right-mouse on Data Change "Sum" to "Count"**

**1c. Table 1 Final Result Coding: 0=No; 1=Yes**

Count of Q1	Q2	0	1	Grand Total
Q1	0	95	35	130
1	78	32	110	
Grand Total	173	67	240	

Any field in the dataset can be used in the body. 32 subjects answer "yes" (1) to Q1 and Q2.

**2a: Insert@L19. Q1 Row; Q2 Col Q7 Values. Change Sum to Ave.**

**2b. Table2 (Final Result) Coding: 0=No; 1=Yes**

Average of Q7	Q2	0	1	Grand Total
Q1	0	66.03	67.31	66.38
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" (1) to Q2.  
62.84 is the average of Q7 answers for those who said "Yes" to both Q1 and Q2..

**3a: Insert@L33. Q1 Row; Q2 Col  
Drag Q7 to Values three times !**

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.

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

If problem dragging Q7 3<sup>rd</sup> time to same place, drag to different place

**3b: If data spreads horizontally,  
move "Sigma Values" to Rows**

**FILTERS**

**COLUMNS**

Q2

Σ Values

**ROWS**

Q1

**VALUES**

Σ Values

Sum of Q7

Sum of Q7\_2

Sum of Q7\_3

**3c: 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.

Q1	Data	0	1	Grand Total
0	Average of Q7	66.03157895	67.31428571	
	Count of Q7_2			
	Sum of Q7_3			
1	Average of Q7	64.83	62.84	64.25
	Count of Q7	78.00	32.00	110.00
	StdDev of Q7_2	12.48	11.62	12.21
Total	Average of Q7	65.49	65.18	65.40
Total	Count of Q7	173.00	67.00	240.00
Total	StdDev of Q7_2	12.12	10.98	11.79

**3d. Table 3 (Final Result)  
Coding: 0=No; 1=Yes**

Q1	Data	0	1	Grand Total
0	Average of Q7	66.03	67.31	66.38
	Count of Q7	95.00	35.00	130.00
	StdDev of Q7_2	11.86	10.05	11.38
1	Average of Q7	64.83	62.84	64.25
	Count of Q7	78.00	32.00	110.00
	StdDev of Q7_2	12.48	11.62	12.21
Total	Average of Q7	65.49	65.18	65.40
Total	Count of Q7	173.00	67.00	240.00
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.

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

Drop Report Filter Fields Here

Sum of Q2

Q1

0

1

Grand Total

0.00

0.00

0.00

67

Insert Table at R6  
Q1 Rows  
Q2 Cols  
Q2 Values

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

Drop Report Filter Fields Here

Count of Q2

Q1

0

1

Grand Total

0.00

1.71

1.71

17

Count of Q2

0

1

Grand Total

0.00

1.71

1.71

17

**4c. Table 4 (Final Result)  
Create 100% Column Table**

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.

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

Copy Table 4 or  
Insert table:  
At R19.  
Q1 Rows  
Q2 Cols  
Q2 Value/Body

**5b. Table 5 (Final Result)  
Create 100% Row Table;**

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.

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

Insert Table  
at R33

Q1 Rows; Q2 Cols;  
Q3 Values (Body)

Leave “Show Values” as “No Calculation”

**6b. Table 6 (Final Result)  
Create two-way half table of Q3**

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.

**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*.

# **Creating Pivot Tables Using Excel 2013**

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# The Goal

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

Creating each of the six tables starts with steps B and C (slides 3 thru 6). Step D (slide 7) is basis for each table

Table 1: Two-way count table (slides 8-10)

Table 2: Two-way table of averages (slides 11-12)

Table 3: Two-group table of statistics (slides 13-16)

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)





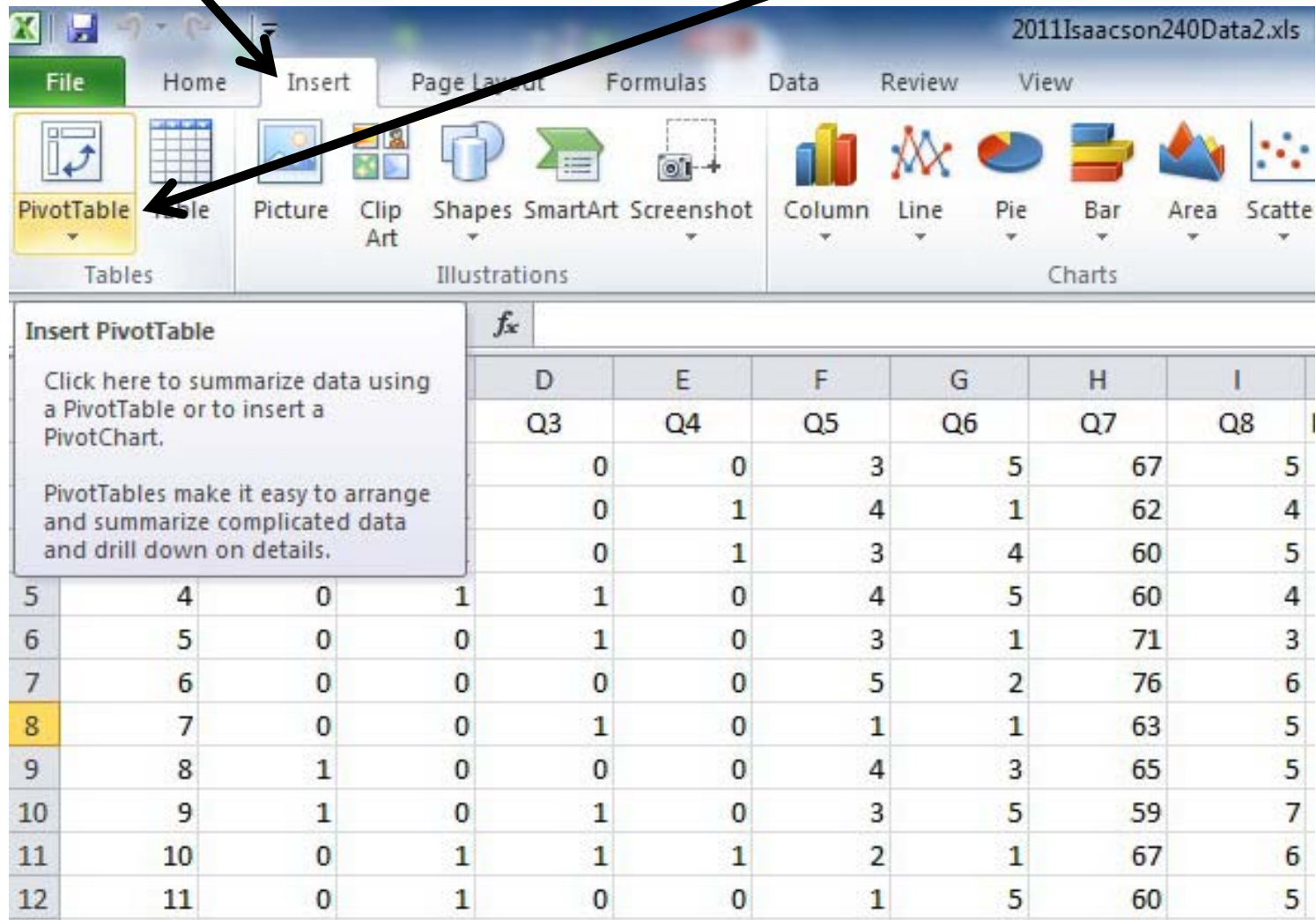
## Create Excel Pivot Tables from this data: A1:H241

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).

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Row	K	L	M
0	1	0	0	3	5	67	5	2	Table 1: Insert pivot table at L6 (Not K6).		
0	1	0	1	4	1	62	4	3	Use Q1 for Values. Show Q1 value:		
0	1	0	1	3	4	60	5	4	Optional: If headings not shown: Pivot Table To		
0	1	1	0	4	5	60	4	5			
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	60	5
8	7	0	0	1	0	4	3	60	4
9	8	1	0	0	0	5	2	76	6
10	9	1	0	1	0	3	5	63	5
11	10	0	1	1	1	2	1	65	5
12	11	0	1	0	0	3	5	59	7

## C: Select/Enter Range as A1:H241 Set 'Location' for each graph.

Row	K	L	M	N	O
2	Table 1: Insert pivot table at L6 (Not K6). Use Q1 for rows, Q2 for Columns.				
3	Use Q1 for Values. Show				
4	Optional: If headings not shown: P				
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

**Create PivotTable**

Choose the data that you want to analyze

Select a table or range

Table/Range:

Use an external data source

Connection name:

Choose where you want the PivotTable report

New Worksheet

Existing Worksheet

Location:

# D: Table Layout w Field List: Build each table from this.

The screenshot shows an Excel spreadsheet with columns L through R. A PivotTable is structured with four distinct areas:

- Drop Report Filter Fields Here:** A horizontal box at the top of the table 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 table area.
- Drop Value Fields Here:** A large central box for the data values.

To the right, the **PivotTable Field List** task pane is open. It contains the following elements:

- Choose fields to add to report:** A list of fields Q1 through Q8, each with an unchecked checkbox.
- 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 of the task pane.
- Update:** A button at the bottom right of the task pane.

# 1a: Insert@L6. Use Q1 for Rows, Q2 for columns, Q1 for Values

The screenshot displays an Excel spreadsheet with columns L through R. A PivotTable layout is shown with four distinct areas: 'Drop Report Filter Fields Here' at the top, 'Drop Column Fields Here' on the right, 'Drop Row Fields Here' on the left, and 'Drop Value Fields Here' in the center. To the right, the 'PivotTable Field List' task pane is open, showing a list of fields from Q1 to Q8. Fields Q1, Q2, and Q3 are checked. Below the list, there are four target areas: 'Report Filter', 'Column Labels', 'Row Labels', and 'Values'. Arrows point from the checked fields to these areas: Q1 to 'Row Labels', Q2 to 'Column Labels', and Q3 to 'Values'. At the bottom of the task pane, there are checkboxes for 'Defer Layout Update' and an 'Update' button.

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

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

The image shows an Excel PivotTable with a right-click context menu open. The PivotTable has a 'Sum of Q1' label circled in black. The context menu is open, and the 'Summarize Values By' option is selected, with 'Count' highlighted as the new aggregation function.

Q1	Q2
0	
1	
Grand Total	

Context Menu Options:

- Copy
- Format Cells...
- Number Format...
- Refresh
- Sort
- Remove "Sum of Q1"
- Summarize Values By
  - Sum
  - Count
- Show Values As

## 1c. Table 1 Final Result

**Coding: 0=No; 1=Yes**

Table 1

Count of Q1	Q2	0	1	Grand Total
Q1	0	95	35	130
1	1	78	32	110
Grand Total	0	173	67	240

Any field in the dataset can be used in the body.  
32 subjects answer “yes” (1) to Q1 and Q2.

## 2a: Insert@L19. Q1 Row; Q2 Col Q7 Values. Change Sum to Ave.

The screenshot shows an Excel PivotTable with the following data:

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

The **Value Field Settings** dialog box is open, showing the following configuration:

- Source Name: Q7
- Custom Name: Average of Q7
- Summarize Values By: Show Values As
- Summarize value field by: Average

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

- Report Filter: (empty)
- Column Labels: Q2
- Row Labels: Q1
- Values: Sum of Q7

The **Value Field Settings** dialog box is open, showing the following configuration:

- Source Name: Q7
- Custom Name: Average of Q7
- Summarize Values By: Show Values As
- Summarize value field by: Average



## 2b. Table2 (Final Result)

**Coding: 0=No; 1=Yes**

Table 2

Average of Q7		Q2		
Q1		0	1	Grand Total
	0	66.03	67.31	66.38
	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” (1) to Q2.

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

## 3a: Insert@L33. Q1 Row; Q2 Col Drag Q7 to Values *three times* !

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**  
Q1

**VALUES**  
Σ Sum of Q7  
Σ Sum of Q7\_2  
Σ Sum of Q7\_3

If problem dragging Q7 3<sup>rd</sup> time to same place, drag to different place

## 3b: If data spreads horizontally, move “Sigma Values” to Rows

The screenshot shows the PivotTable task pane with four sections: FILTERS, COLUMNS, ROWS, and VALUES. A black arrow points from the 'Σ Values' dropdown in the COLUMNS section to the 'Q1' dropdown in the ROWS section, indicating the instruction to move sigma values to rows.

Section	Item
FILTERS	(Empty)
COLUMNS	Q2
COLUMNS	Σ Values
ROWS	Q1
VALUES	Σ VALUES
VALUES	Sum of Q7
VALUES	Sum of Q7_2
VALUES	Sum of Q7_3

## 3c: 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

## **3d. Table 3 (Final Result)**

### **Coding: 0=No; 1=Yes**

		Q2 <input type="text" value="0"/>		
Q1 <input type="text" value="0"/>	Data	0	1	Grand Total
0	Average of Q7	66.03	67.31	66.38
	Count of Q7	95.00	35.00	130.00
	StdDev of Q7_2	11.86	10.05	11.38
1	Average of Q7	64.83	62.84	64.25
	Count of Q7	78.00	32.00	110.00
	StdDev of Q7_2	12.48	11.62	12.21
Total Average of Q7		65.49	65.18	65.40
Total Count of Q7		173.00	67.00	240.00
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.

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

Insert Table  
at R6  
Q1 Rows  
Q2 Cols  
Q2 Values

The screenshot shows an Excel 2013 interface with a PivotTable and the 'Summarize Values By' context menu open. The PivotTable is located in the range R6:C8. The 'Summarize Values By' menu is open, and the 'Count' option is selected. The PivotTable shows 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 'Summarize Values By' menu is open, and the 'Count' option is selected. The PivotTable shows the following data:

Report Filter	Column Labels
	Q2
Row Labels	Σ Values
Q1	Sum of Q2

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



## 4b: Select “Show Values as” Select “% of Column Total”

The screenshot displays an Excel PivotTable with the following data:

Q1	Q2	Q3	Q4
0	95.00	25.00	130.00
1	78.00	12.00	110.00
<b>Grand Total</b>	<b>173.00</b>	<b>37.00</b>	<b>240.00</b>

The PivotTable is set to show values as a percentage of the column total. The 'Show Values As' menu is open, and the 'Show Values As' option is selected. The 'Value Field Settings' task pane is also visible, showing the 'Count of Q2' field in the 'Values' area.

The 'Show Values As' 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...
- Rank Smallest to Largest...
- Rank Largest to Smallest...
- Index
- More Options...

The 'Value Field Settings' task pane shows the following configuration:

- Report Filter: (empty)
- Column Labels: Q2
- Row Labels: Q1
- Values: Count of Q2
- Defer Layout Update:
- Update: [Update]



## 4c. Table 4 (Final Result)

### Create 100% Column Table

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.

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

Count of Q2	Q2	Grand Total
Q1	0	100.00%
	1	54.91%
	2	45.09%
Grand Total		100.00%

Copy Table 4 or  
Insert table:  
At R19.  
Q1 Rows  
Q2 Cols  
Q2 Value/Body

## **5b. Table 5 (Final Result)**

### **Create 100% Row Table;**

**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.

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

Insert Table  
at R33

Drop Report Filter Fields Here

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

Q1 Rows; Q2 Cols;  
Q3 Values (Body)

The screenshot shows the PivotTable Field List on the left and the Value Field Settings dialog box on the right. The Value Field Settings dialog box is open for the 'Q3' source. The 'Custom Name' is 'Average of Q3'. The 'Summarize value field by' dropdown is set to 'Average'. The 'Show Values As' tab is selected, and the 'Number Format' button is visible at the bottom.

Leave “Show Values” as “No Calculation”

## **6b. Table 6 (Final Result)**

### **Create two-way half table of Q3**

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.**

# Conclusion

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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*.