

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	1A
0	1	0	0	3	5	67	5	<p>Single sample: Create Margin of Error using Descriptive Statistics command</p> <p>See www.StatLit.org/pdf/Create-Confidence-Intervals-Excel2013-1up.pdf Create-Confidence-Intervals-Excel2010.xlsx</p> <p>Step-by-step instructions</p> <p>1) From Data menu, select "Data Analysis". Select "Descriptive Statistics.;" Press OK. Select input range: A1:H241. Make sure to include row 1 with column headings. Check the check box: "Labels in first row" Under "Output Options", select radio button for "Output Range". Set range at J19 Check boxes for "Summary statistics" and "Confidence Level..." Press OK.</p> <p>2) Move Question IDs over the associated numeric results (one col to the right) Select and delete columns with repeated row descriptions: X, V, T, R, P, N and L. Tighten column width so it prints on single page (landscape). Format as shown. Confidence (bottom line) is margin of error. Upper-right Conf. Int for Q1 is 0.52: 0.46 + 0.06.</p>
0	1	0	1	4	1	62	4	
0	1	0	1	3	4	60	5	
0	1	1	0	4	5	60	4	
0	0	1	0	3	1	71	3	
0	0	0	0	5	2	76	6	
0	0	1	0	1	1	63	5	
1	0	0	0	4	3	65	5	
1	0	1	0	3	5	59	7	
0	1	1	1	2	1	67	6	
0	1	0	0	1	5	60	5	
1	0	1	0	3	2	68	5	
0	1	1	1	1	3	61	3	
0	0	1	0	4	2	67	6	
1	0	0	0	4	2	70	6	
1	0	0	1	5	1	54	5	
1	0	1	1	3	2	48	6	
1	0	1	1	4	1	64	6	
0	1	1	1	3	1	73	4	
1	0	0	0	5	1	66	7	
0	0	1	0	3	2	69	5	
0	0	1	0	2	3	76	4	
0	0	0	0	4	2	65	6	
0	0	1	0	3	4	62	4	
0	1	1	1	5	4	76	6	
0	0	1	0	4	4	73	6	
1	0	1	0	5	1	76	3	
0	0	0	0	1	4	67	6	
0	0	1	1	4	2	43	6	
1	0	1	1	4	2	73	6	
1	0	0	0	5	4	57	6	
0	0	0	0	2	4	66	7	
1	0	0	0	5	1	52	4	

Row	J	K	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
18										
19										
20										
	Mean		0.46	0.28	0.59	0.37	3.48	2.59	65.40	5.51
	Standard Error		0.03	0.03	0.03	0.03	0.08	0.09	0.76	0.08
	Median		0	0	1	0	4	2	65	6
	Mode		0	0	1	0	3	2	76	6
	Standard Deviation		0.50	0.45	0.49	0.48	1.21	1.42	11.79	1.16
	Sample Variance		0.25	0.20	0.24	0.23	1.46	2.03	139.08	1.36
	Kurtosis		-1.99	-1.03	-1.87	-1.70	-0.33	-1.22	0.39	0.21
	Skewness		0.17	0.99	-0.38	0.56	-0.57	0.43	0.34	0.15
	Range		1	1	1	1	4	4	66	6
	Minimum		0	0	0	0	1	1	34	3
	Maximum		1	1	1	1	5	5	100	9
	Sum		110	67	142	88	835	622	15697	1323
	Count		240	240	240	240	240	240	240	240
	Confidence Level(95%)		0.06	0.06	0.06	0.06	0.15	0.18	1.50	0.15

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	1B	Single sample: Create Confidence Intervals using CONFIDENCE.T										
0	1	0	0	3	5	67	5												
0	1	0	1	4	1	62	4	Step-by-step instructions											
0	1	0	1	3	4	60	5	1) R12: Input alpha (0.05): this is the amount of allowable sampling error.											
0	1	1	0	4	5	60	4	2) R13: Enter sample size formula.											
0	0	1	0	3	1	71	3	3) Enter formula in cell R16 and R17. Pull to the left to column K.											
0	0	0	0	5	2	76	6	4) Enter formula in cells R19, R20, and R21. Pull to the left to column K											
0	0	1	0	1	1	63	5	5) Format all decimal fractions as numeric with 2 digits after decimal											
1	0	0	0	4	3	65	5												
1	0	1	0	3	5	59	7												
0	1	1	1	2	1	67	6	Row	J	K	L	M	N	O	P	Q	R	Formula in col S is for col R	
0	1	0	0	1	5	60	5	12								Alpha	0.05	Manual Entry	
1	0	1	0	3	2	68	5	13								Sample size	240	=COUNTA(A2:A241)	
0	1	1	1	1	3	61	3	14											
0	0	1	0	4	2	67	6	15	Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Question	
1	0	0	0	4	2	70	6	16	Average	0.46	0.28	0.59	0.37	3.48	2.59	65.4	5.51	=AVERAGE(H2:H241)	
1	0	0	1	5	1	54	5	17	StDev Sample	0.50	0.45	0.49	0.48	1.21	1.42	11.79	1.16	=STDEV.S(H2:H241)	
1	0	1	1	3	2	48	6	18	Stdev.S and confidence.T is most conservative									Enter dollar signs (\$) as shown	
1	0	1	1	4	1	64	6	19	Margin Error	0.06	0.06	0.06	0.06	0.15	0.18	1.50	0.15	=CONFIDENCE.T(\$R12,R17,\$R13)	
0	1	1	1	3	1	73	4	20	Cnflnt: Up-Right	0.52	0.34	0.65	0.43	3.63	2.77	66.90	5.66	=R16+R19	
1	0	0	0	5	1	66	7	21	Cnflnt:Low-Left	0.39	0.22	0.53	0.31	3.33	2.41	63.90	5.36	=R16-R19	
0	0	1	0	3	2	69	5												
0	0	1	0	2	3	76	4												
0	0	0	0	4	2	65	6												
0	0	1	0	3	4	62	4												
0	1	1	1	5	4	76	6												
0	0	1	0	4	4	73	6												
1	0	1	0	5	1	76	3												
0	0	0	0	1	4	67	6												
0	0	1	1	4	2	43	6												
1	0	1	1	4	2	73	6												
1	0	0	0	5	4	57	6												
0	0	0	0	2	4	66	7												
1	0	0	0	5	1	52	4												

Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8

2A

Two subgroups: Create Confidence Intervals using a Pivot Table

0	1	0	0	3	5	67	5
0	1	0	1	4	1	62	4
0	1	0	1	3	4	60	5
0	1	1	0	4	5	60	4
0	0	1	0	3	1	71	3
0	0	0	0	5	2	76	6
0	0	1	0	1	1	63	5
1	0	0	0	4	3	65	5
1	0	1	0	3	5	59	7
0	1	1	1	2	1	67	6
0	1	0	0	1	5	60	5
1	0	1	0	3	2	68	5
0	1	1	1	1	3	61	3
0	0	1	0	4	2	67	6
1	0	0	0	4	2	70	6
1	0	0	1	5	1	54	5
1	0	1	1	3	2	48	6
1	0	1	1	4	1	64	6
0	1	1	1	3	1	73	4
1	0	0	0	5	1	66	7
0	0	1	0	3	2	69	5
0	0	1	0	2	3	76	4
0	0	0	0	4	2	65	6
0	0	1	0	3	4	62	4
0	1	1	1	5	4	76	6
0	0	1	0	4	4	73	6
1	0	1	0	5	1	76	3
0	0	0	0	1	4	67	6
0	0	1	1	4	2	43	6
1	0	1	1	4	2	73	6
1	0	0	0	5	4	57	6
0	0	0	0	2	4	66	7
1	0	0	0	5	1	52	4

- Can't use Confidence function in a pivot table. Must use Z, StDev and Count
- Insert Pivot table behaves like a command -- not a function! Data is not automatically updated
- 1 Enter confidence level
- 2 Select data in A1:B241. Insert pivot-table. **Output to existing sheet: K30.**
- 3 Use Q2 for column headings. Use Q1 for data values. Drag Q1 into values three times.
- 4 To get multiple data values to appear in same columns (to be in multiple rows), drag "Sum Values" from Columns area to Rows area.
- 5 For data values, change "summarize values by": 1st to Average; 2nd to Stdev, 3rd to Count
- 6 Create Margin of Error, difference in proportions and confidence intervals. Don't reference pivot table cells by pointing. Reference them using column and row. Use Confidence.T for Margin of Error if the data is quantitative
- 7 Do confidence intervals overlap? Is difference statistically significant?

Row

J	K	L	M	N	Formula for cell to the left
1	Go to Step 2	Confidence Level	0.95	Manual entry	
**	**	**	**	**	**
		Q1 if Q2=0	Q1 if Q2=1	Q1	
6	Margin of Error	7%	12%	6%	=CONFIDENCE.NORM(1-\$N17,N33,N34)
					Use Confidence.T if data is quantitative
	Difference in sample proportions.			3%	=ABS(M32-L32)
	CI-Upper-Right	53%	60%	52%	=N32+N20
	CI-Lower-Left	38%	36%	40%	=N32-N20
	Note: Formulas in columns L and M are determined by those in column N				
7	Confidence Intervals overlap/touch?			YES	Manual entry
	Is difference statistically significant?			NO	Manual entry. Use overlap test

28

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30

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	Column Labels		
Values	0	1	Grand Total
Average of Q1	0.45	0.48	0.46
StdDev of Q1_2	0.50	0.50	0.50
Count of Q1_3	173	67	240

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
0	1	0	0	3	5	67	5
0	1	0	1	4	1	62	4
0	1	0	1	3	4	60	5
0	1	1	0	4	5	60	4
0	0	1	0	3	1	71	3
0	0	0	0	5	2	76	6
0	0	1	0	1	1	63	5
1	0	0	0	4	3	65	5
1	0	1	0	3	5	59	7
0	1	1	1	2	1	67	6
0	1	0	0	1	5	60	5
1	0	1	0	3	2	68	5
0	1	1	1	1	3	61	3
0	0	1	0	4	2	67	6
1	0	0	0	4	2	70	6
1	0	0	1	5	1	54	5
1	0	1	1	3	2	48	6
1	0	1	1	4	1	64	6
0	1	1	1	3	1	73	4
1	0	0	0	5	1	66	7
0	0	1	0	3	2	69	5
0	0	1	0	2	3	76	4
0	0	0	0	4	2	65	6
0	0	1	0	3	4	62	4
0	1	1	1	5	4	76	6
0	0	1	0	4	4	73	6
1	0	1	0	5	1	76	3
0	0	0	0	1	4	67	6
0	0	1	1	4	2	43	6
1	0	1	1	4	2	73	6
1	0	0	0	5	4	57	6
0	0	0	0	2	4	66	7
1	0	0	0	5	1	52	4

2B Two sub-groups: Create Confidence Intervals using array functions

This approach uses only functions -- no commands. A pivot table behaves like a command.

Step-by-step instructions:

- 1 Enter confidence level in L15. Create Z-cutoff (2 tails) in cell N15.
- 2 M18: Enter AVERAGEIF function for Q1 when Q2=1. Drag left to L20. Replace =1 with =0.
- 3 M21: Enter STDEV of Q1 if Q2=1. Enter using CTRL-SHIFT-ENTER. Drag left. Change to =0.
- 4 M24: Enter COUNTIF of Q1 for Q2=1. Drag left. Replace =1 with =0.
- 5 M25: Enter Margin of Error for Q1 when Q2=1. Drag left.
- 6 M27: Enter upper right end of Q1 confidence interval for Q2=1. Drag left.
M28: Enter lower-left end of Q1 confidence interval for Q2=1. Drag left.
- 7 M29: Do confidence intervals overlap? M30: is difference statistically significant?

Row

	J	K	L	M	N	Formula for cell to the left
14						
15	1	Confidence Level	0.95	Z (2 tail)	1.96	=NORM.S.INV(0.5+L15/2)
17		L18: Change 1 to 0	Q2=0	Q2=1		Drag M19 to M18. Change =1 to =0
18	2	Q1 average	45%	48%		=AVERAGEIF(\$B2:\$B241,"=1",\$A2:\$A241)
20		L21: Change 1 to 0				Do not enter braces shown below!
21	3	Q1 Stdev	50%	50%		{=STDEV(IF(\$B2:\$B241=1,\$A2:\$A241))}
22						Use CTRL-SHIFT-ENTER to create braces!
23		L24: Change 1 to 0				
24	4	Q1 sample size	173	67		=COUNTIF(\$B2:\$B241,"=1")
25	5	Q1 Margin of Error	7%	12%		=\$N15*M21/SQRT(M24)
27	6	Q1 Cnf Int Up-Right	53%	60%		=M18+M25
28		Q1 Cnf Int Low-Left	38%	36%		=M18-M25
29	7	Overlap or touch?		YES		
30		Is difference stat. significant?		NO		Use overlap test

Change =1 to =0 in L19, L22 and L25.

Calculate Margin of Error using Confidence.T when data is quantitative