

Dixon's Q-test

A statistically valid method for eliminating an outlier

Sample of the Excel Spreadsheet with 15 data points

Q_test_worksheet - Excel (Product Activation Failed)

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Font Alignment Number Styles Cells Editing

1	Measurements	Outlier	Gap	Range	Q	Confidence	Critical Value	Outlier Y/N
2	1.369311	1.369311	0.54122722	1.36197	0.397385	95%	0.466	N
3	0.828084							
4	0.725857							
5	0.674847							
6	0.647857							
7	0.540258							
8	0.467764							
9	0.420341							
10	0.245519							
11	0.22575							
12	0.11529							
13	0.112528							
14	0.063716							
15	0.007341							

Sort & Filter

Organize your data so it's easier to analyze.

You can sort the selected data from smallest to largest, largest to smallest, or filter out specific values.

Sample Size

3	
4	
5	
6	0.025
7	0.568
8	0.526
9	0.493
10	0.466

Sheet1

Average: 0.460318785 Count: 14 Sum: 6.444462994

Change the number of data points in accord with data

Q_test_worksheet - Excel (Product Activation Failed)

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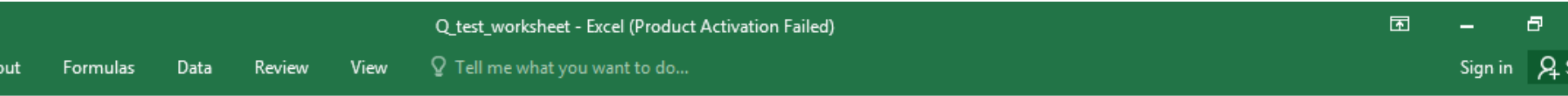
=MAX(\$A\$2:\$A\$15)-MIN(\$A\$2:\$A\$15)

A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Measurements		Outlier	Gap	Range	Q	Confidence	Critical Value	Outlier Y/N				
2	1.369311		0.369311	0.54122722	=MAX(\$A\$2:\$A\$15)-MIN(\$A\$2:\$A\$15)	0.397385	95%	0.466	N				
3	0.828084										Sample Size	95% Conf.	
4	0.725857										3	0.97	
5	0.674847										4	0.829	
6	0.647857										5	0.71	
7	0.540258										6	0.625	
8	0.467764										7	0.568	
9	0.420341										8	0.526	
10	0.245519										9	0.493	
11	0.22575										10	0.466	
12	0.11529												
13	0.112528												
14	0.063716												
15	0.007341												

In cell F2 change MAX and MIN so that \$A\$15 corresponds to the number of points

Sheet1

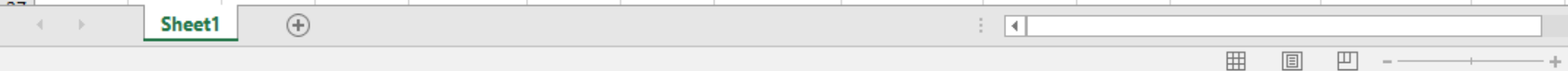
Change the critical value in accord with data



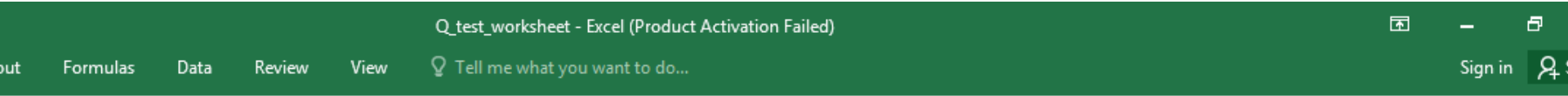
=MAX(\$A\$2:\$A\$15)-MIN(\$A\$2:\$A\$15)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Measurements			Outlier	Gap	Range	Q	Confidence	Critical Value	Outlier Y/N				
2	1.369311			1.369311	0.54122722	=MAX(\$A\$	0.397385	95%	0.466	N				
3	0.828084											Sample Size	95% Conf.	
4	0.725857											3	0.97	
5	0.674847											4	0.829	
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9	0.420341											8	0.526	
10	0.245519											9	0.493	
11	0.22575											10	0.466	
12	0.11529													
13	0.112528													
14	0.063716													
15	0.007341													

In cell I2 change the value in accord with the table. Like the t-test value the critical value reaches a limiting value as the number of points increases. To be safe I recommend 0.466 for any data set with greater than 10 points.



The result is given in J2



=MAX(\$A\$2:\$A\$15)-MIN(\$A\$2:\$A\$15)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Measurements			Outlier	Gap	Range	Q	Confidence	Critical Value	Outlier Y/N				
2	1.369311			1.369311	0.54122722	=MAX(\$A\$2:\$A\$15)-MIN(\$A\$2:\$A\$15)	0.397385	95%	0.466	N				
3	0.828084											Sample Size	95% Conf.	
4	0.725857											3	0.97	
5	0.674847											4	0.829	
6	0.647857											5	0.71	
7	0.540258											6	0.625	
8	0.467764											7	0.568	
9	0.420341											8	0.526	
10	0.245519											9	0.493	
11	0.22575											10	0.466	
12	0.11529													
13	0.112528													
14	0.063716													
15	0.007341													

After making the changes in F2 and I2
The result is given in J2. Obviously,
N means that the point is not an outlier
Y means that the point is an outlier.
Apply the Q-test to a data set only once.
Either there is one outlier or zero.

