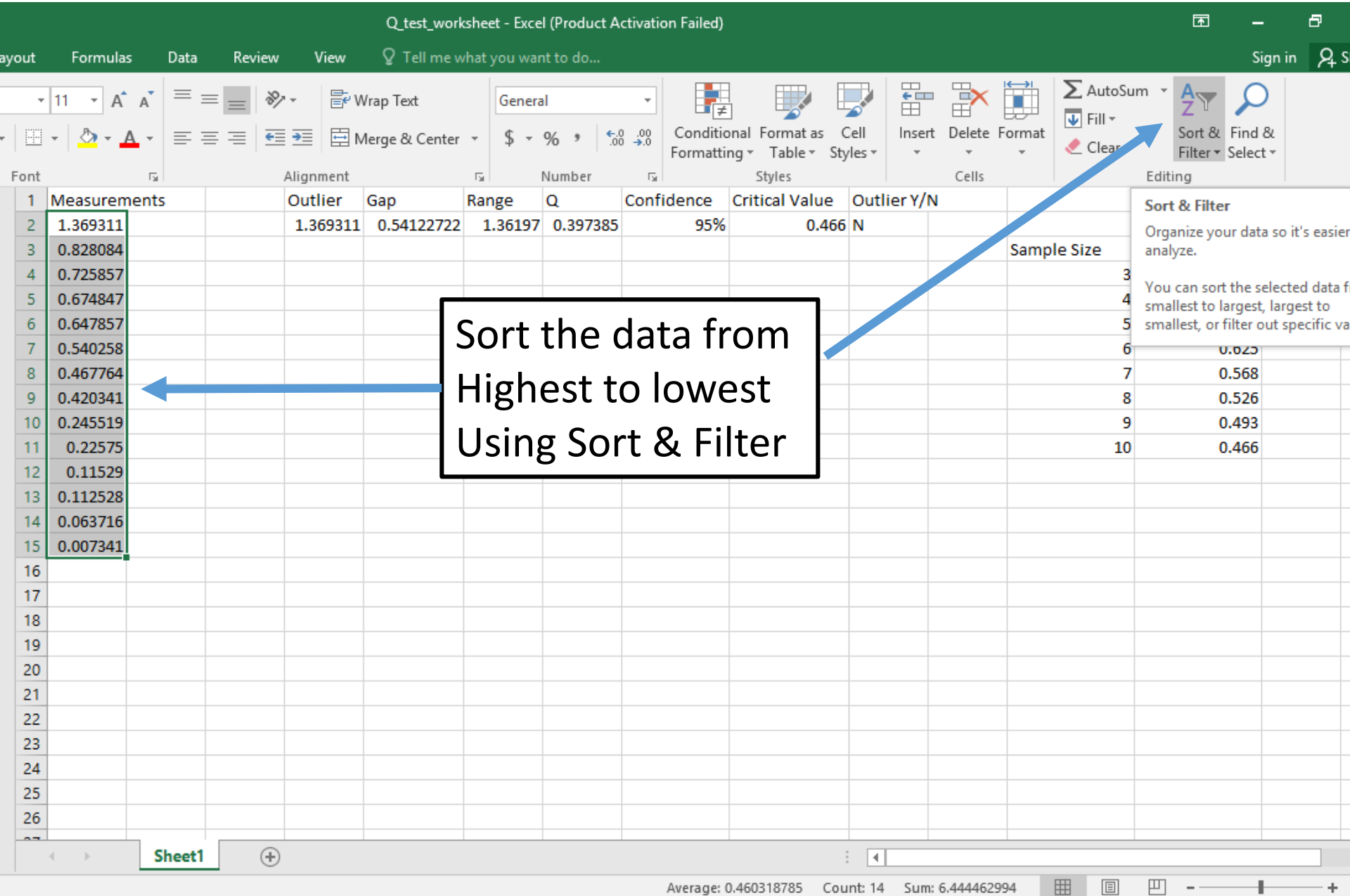
Dixon’s Q-test

A statistically valid method for eliminating an outlier

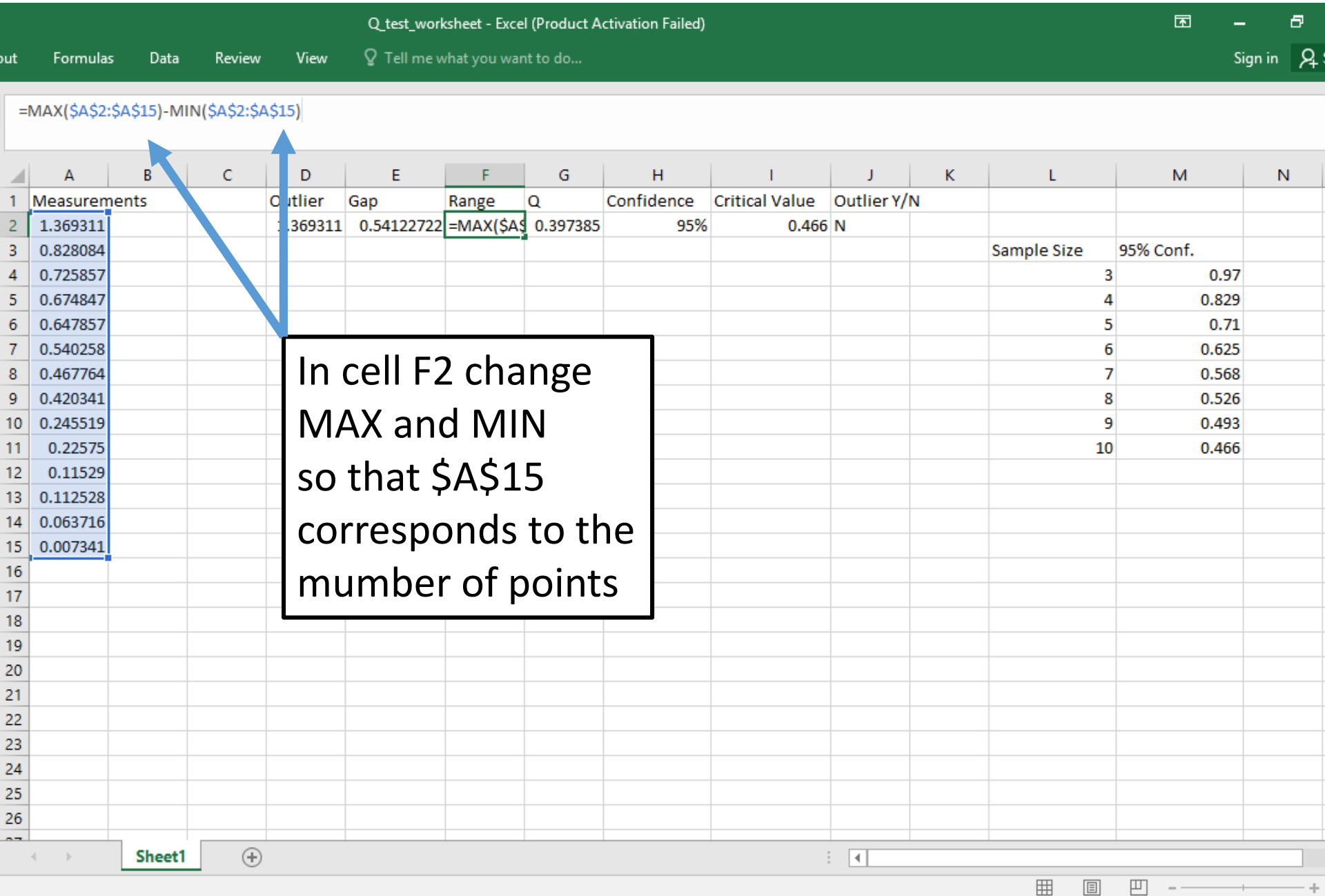
Sample of the Excel Spreadsheet with 15 data points



	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							
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								
26								

Sample Size	
3	
4	
5	
6	0.625
7	0.568
8	0.526
9	0.493
10	0.466

Change the number of data points in accord with data



	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	
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													
16														
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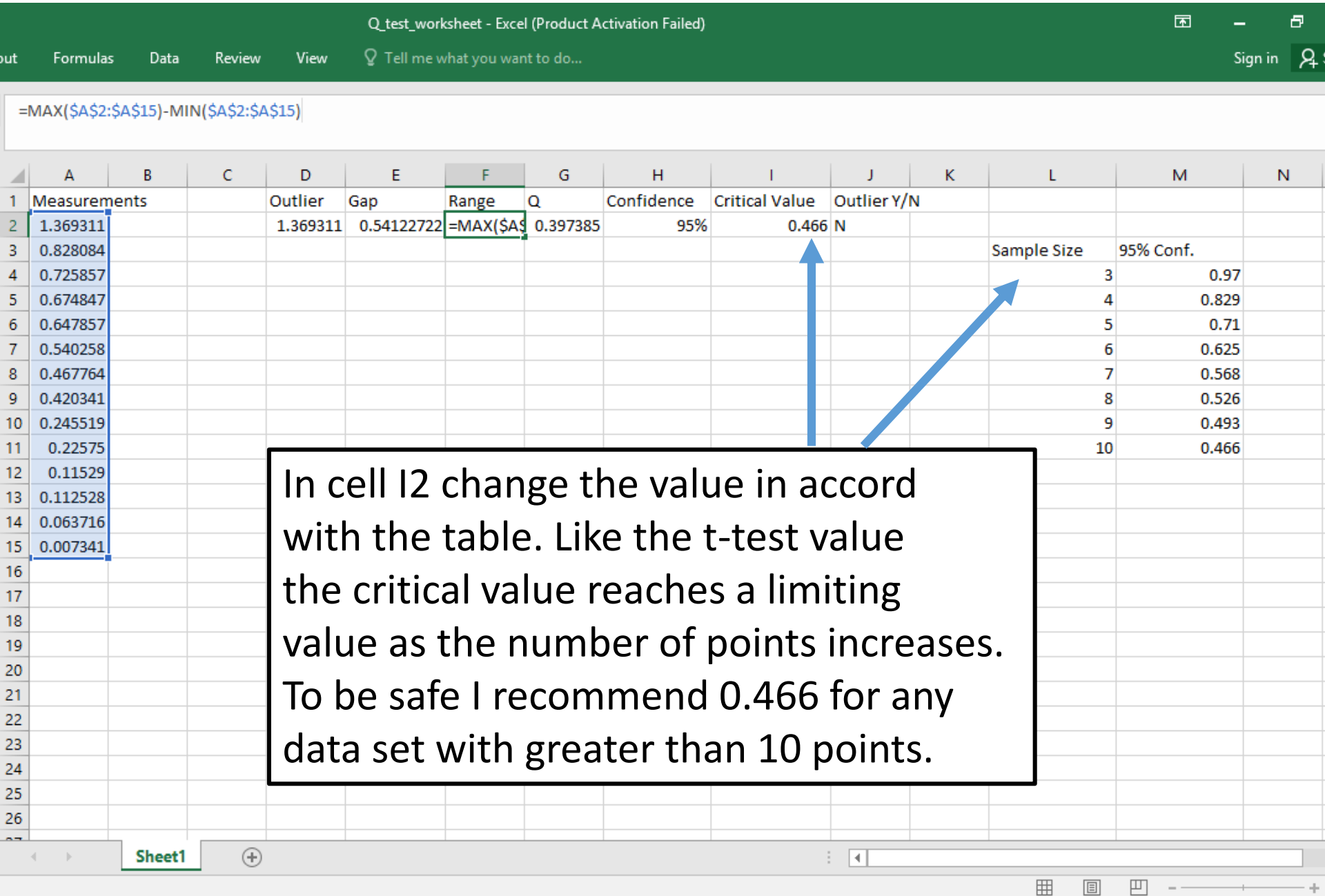
21														
22														
23														
24														
25														
26														

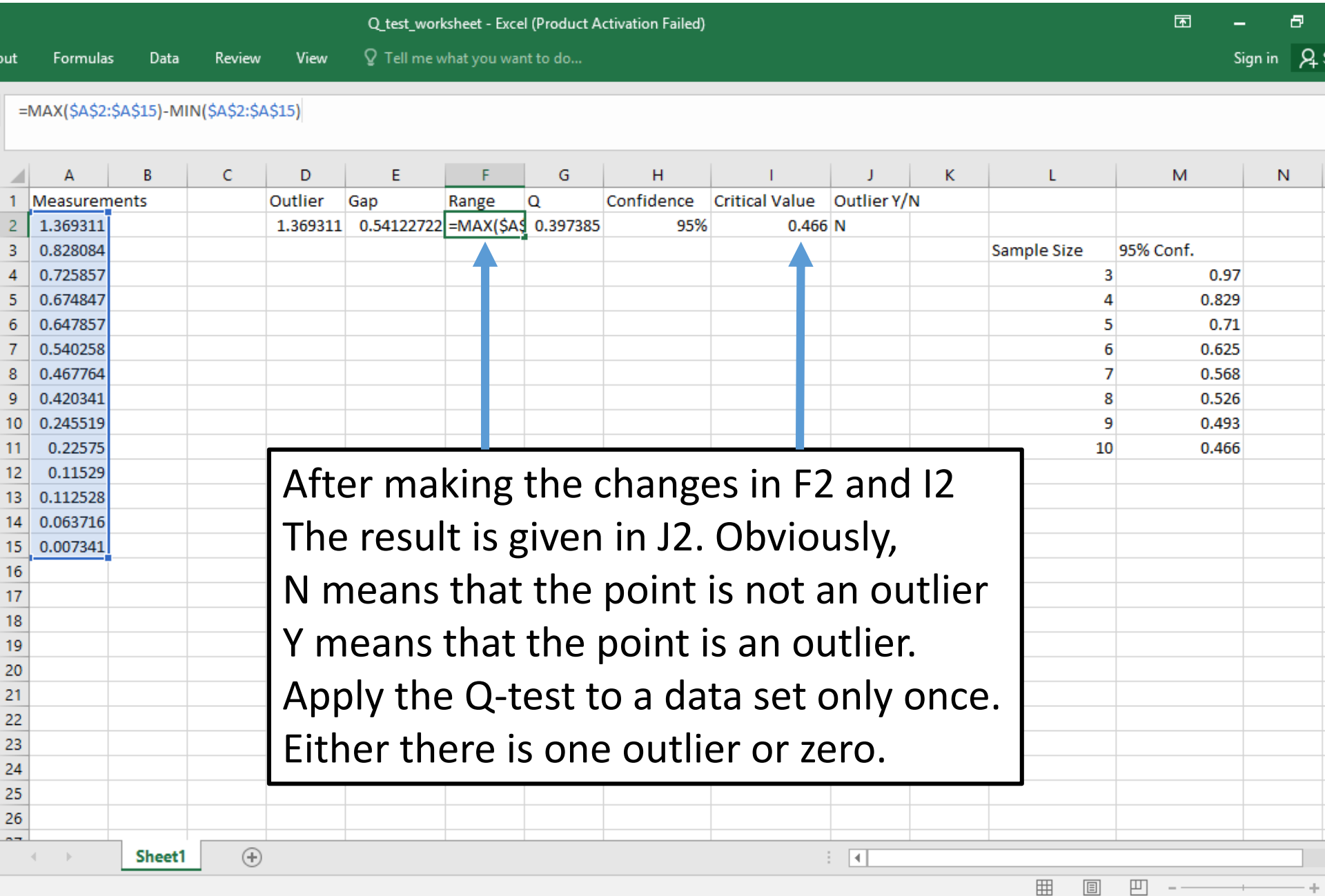
Change the critical value in accord with data



	A	D	E	F	G	H	I	J	L	M
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
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 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



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.