	A	B	C	D	E	F	G	H	I	J	K	L
1	UCL Statistics for Uncensored Full Data Sets											
2												
3	User Selected Options											
4	Date/Time of Computation			2/18/2015 1:41:58 PM								
5	From File			EPC_015Sub_EU08.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												

	A	B	C	D	E	F	G	H	I	J	K	L
11	Antimony											
12												
13					General Statistics							
14					Total Number of Observations	12			Number of Distinct Observations			12
15									Number of Missing Observations			0
16					Minimum	55.87			Mean			87.57
17					Maximum	123.8			Median			85.18
18					SD	22.7			Std. Error of Mean			6.553
19					Coefficient of Variation	0.259			Skewness			0.0733
20												
21					Normal GOF Test							
22					Shapiro Wilk Test Statistic	0.948			Shapiro Wilk GOF Test			
23					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
24					Lilliefors Test Statistic	0.137			Lilliefors GOF Test			
25					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
26					Data appear Normal at 5% Significance Level							
27												
28					Assuming Normal Distribution							
29					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
30					95% Student's-t UCL	99.34			95% Adjusted-CLT UCL (Chen-1995)			98.49
31									95% Modified-t UCL (Johnson-1978)			99.36
32												
33					Gamma GOF Test							
34					A-D Test Statistic	0.299			Anderson-Darling Gamma GOF Test			
35					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
36					K-S Test Statistic	0.16			Kolmogrov-Smirnoff Gamma GOF Test			
37					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
38					Detected data appear Gamma Distributed at 5% Significance Level							
39												
40					Gamma Statistics							
41					k hat (MLE)	15.67			k star (bias corrected MLE)			11.81
42					Theta hat (MLE)	5.589			Theta star (bias corrected MLE)			7.417
43					nu hat (MLE)	376			nu star (bias corrected)			283.4
44					MLE Mean (bias corrected)	87.57			MLE Sd (bias corrected)			25.48
45									Approximate Chi Square Value (0.05)			245.4
46					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			240
47												
48					Assuming Gamma Distribution							
49					95% Approximate Gamma UCL (use when n>=50))	101.1			95% Adjusted Gamma UCL (use when n<50)			103.4
50												
51					Lognormal GOF Test							
52					Shapiro Wilk Test Statistic	0.94			Shapiro Wilk Lognormal GOF Test			
53					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
54					Lilliefors Test Statistic	0.157			Lilliefors Lognormal GOF Test			
55					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
56					Data appear Lognormal at 5% Significance Level							
57												
58					Lognormal Statistics							
59					Minimum of Logged Data	4.023			Mean of logged Data			4.44
60					Maximum of Logged Data	4.819			SD of logged Data			0.269
61												

	A	B	C	D	E	F	G	H	I	J	K	L
62	Assuming Lognormal Distribution											
63					95% H-UCL	102.5				90% Chebyshev (MVUE) UCL		108.2
64				95% Chebyshev (MVUE) UCL		117.5				97.5% Chebyshev (MVUE) UCL		130.4
65				99% Chebyshev (MVUE) UCL		155.8						
66												
67	Nonparametric Distribution Free UCL Statistics											
68	Data appear to follow a Discernible Distribution at 5% Significance Level											
69												
70	Nonparametric Distribution Free UCLs											
71					95% CLT UCL	98.35				95% Jackknife UCL		99.34
72				95% Standard Bootstrap UCL		97.85				95% Bootstrap-t UCL		100.2
73				95% Hall's Bootstrap UCL		97.76				95% Percentile Bootstrap UCL		98.02
74				95% BCA Bootstrap UCL		97.7						
75				90% Chebyshev(Mean, Sd) UCL		107.2				95% Chebyshev(Mean, Sd) UCL		116.1
76				97.5% Chebyshev(Mean, Sd) UCL		128.5				99% Chebyshev(Mean, Sd) UCL		152.8
77												
78	Suggested UCL to Use											
79					95% Student's-t UCL	99.34						
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
83	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
84	For additional insight the user may want to consult a statistician.											
85												
86												

	A	B	C	D	E	F	G	H	I	J	K	L
87	Arsenic											
88												
89					General Statistics							
90					Total Number of Observations	12			Number of Distinct Observations			11
91									Number of Missing Observations			0
92					Minimum	4.7			Mean			10.09
93					Maximum	13.83			Median			10.74
94					SD	2.563			Std. Error of Mean			0.74
95					Coefficient of Variation	0.254			Skewness			-0.928
96												
97					Normal GOF Test							
98					Shapiro Wilk Test Statistic	0.926			Shapiro Wilk GOF Test			
99					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
100					Lilliefors Test Statistic	0.153			Lilliefors GOF Test			
101					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
102					Data appear Normal at 5% Significance Level							
103												
104					Assuming Normal Distribution							
105					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
106					95% Student's-t UCL	11.42			95% Adjusted-CLT UCL (Chen-1995)			11.1
107									95% Modified-t UCL (Johnson-1978)			11.39
108												
109					Gamma GOF Test							
110					A-D Test Statistic	0.682			Anderson-Darling Gamma GOF Test			
111					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
112					K-S Test Statistic	0.191			Kolmogrov-Smirnoff Gamma GOF Test			
113					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
114					Detected data appear Gamma Distributed at 5% Significance Level							
115												
116					Gamma Statistics							
117					k hat (MLE)	13.5			k star (bias corrected MLE)			10.18
118					Theta hat (MLE)	0.748			Theta star (bias corrected MLE)			0.991
119					nu hat (MLE)	324			nu star (bias corrected)			244.3
120					MLE Mean (bias corrected)	10.09			MLE Sd (bias corrected)			3.163
121									Approximate Chi Square Value (0.05)			209.1
122					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			204.2
123												
124					Assuming Gamma Distribution							
125					95% Approximate Gamma UCL (use when n>=50))	11.79			95% Adjusted Gamma UCL (use when n<50)			12.08
126												
127					Lognormal GOF Test							
128					Shapiro Wilk Test Statistic	0.844			Shapiro Wilk Lognormal GOF Test			
129					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
130					Lilliefors Test Statistic	0.218			Lilliefors Lognormal GOF Test			
131					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
132					Data appear Approximate Lognormal at 5% Significance Level							
133												
134					Lognormal Statistics							
135					Minimum of Logged Data	1.548			Mean of logged Data			2.274
136					Maximum of Logged Data	2.627			SD of logged Data			0.305
137												

	A	B	C	D	E	F	G	H	I	J	K	L
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	12.16				90% Chebyshev (MVUE) UCL		12.85
140				95% Chebyshev (MVUE) UCL		14.07				97.5% Chebyshev (MVUE) UCL		15.77
141				99% Chebyshev (MVUE) UCL		19.12						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
145												
146	**Nonparametric Distribution Free UCLs**											
147					95% CLT UCL	11.31				95% Jackknife UCL		11.42
148				95% Standard Bootstrap UCL		11.24				95% Bootstrap-t UCL		11.18
149				95% Hall's Bootstrap UCL		11.13				95% Percentile Bootstrap UCL		11.22
150				95% BCA Bootstrap UCL		11.14						
151				90% Chebyshev(Mean, Sd) UCL		12.31				95% Chebyshev(Mean, Sd) UCL		13.32
152				97.5% Chebyshev(Mean, Sd) UCL		14.71				99% Chebyshev(Mean, Sd) UCL		17.45
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL		11.42						
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
159	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
160	For additional insight the user may want to consult a statistician.											
161												
162	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
163	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
164												
165												

	A	B	C	D	E	F	G	H	I	J	K	L
166	Cadmium											
167												
168					General Statistics							
169					Total Number of Observations	12			Number of Distinct Observations			4
170									Number of Missing Observations			0
171					Minimum	0.74			Mean			11.85
172					Maximum	16.9			Median			12
173					SD	3.95			Std. Error of Mean			1.14
174					Coefficient of Variation	0.333			Skewness			-2.014
175												
176					Normal GOF Test							
177					Shapiro Wilk Test Statistic	0.627			Shapiro Wilk GOF Test			
178					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
179					Lilliefors Test Statistic	0.432			Lilliefors GOF Test			
180					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
181					Data Not Normal at 5% Significance Level							
182												
183					Assuming Normal Distribution							
184					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
185					95% Student's-t UCL	13.9			95% Adjusted-CLT UCL (Chen-1995)			13.02
186									95% Modified-t UCL (Johnson-1978)			13.79
187												
188					Gamma GOF Test							
189					A-D Test Statistic	2.946			Anderson-Darling Gamma GOF Test			
190					5% A-D Critical Value	0.738			Data Not Gamma Distributed at 5% Significance Level			
191					K-S Test Statistic	0.5			Kolmogrov-Smirnoff Gamma GOF Test			
192					5% K-S Critical Value	0.247			Data Not Gamma Distributed at 5% Significance Level			
193					Data Not Gamma Distributed at 5% Significance Level							
194												
195					Gamma Statistics							
196					k hat (MLE)	3.201			k star (bias corrected MLE)			2.456
197					Theta hat (MLE)	3.703			Theta star (bias corrected MLE)			4.826
198					nu hat (MLE)	76.82			nu star (bias corrected)			58.95
199					MLE Mean (bias corrected)	11.85			MLE Sd (bias corrected)			7.563
200									Approximate Chi Square Value (0.05)			42.29
201					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			40.15
202												
203					Assuming Gamma Distribution							
204					95% Approximate Gamma UCL (use when n>=50))	16.52			95% Adjusted Gamma UCL (use when n<50)			17.4
205												
206					Lognormal GOF Test							
207					Shapiro Wilk Test Statistic	0.436			Shapiro Wilk Lognormal GOF Test			
208					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
209					Lilliefors Test Statistic	0.501			Lilliefors Lognormal GOF Test			
210					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
211					Data Not Lognormal at 5% Significance Level							
212												
213					Lognormal Statistics							
214					Minimum of Logged Data	-0.301			Mean of logged Data			2.308
215					Maximum of Logged Data	2.827			SD of logged Data			0.832
216												

	A	B	C	D	E	F	G	H	I	J	K	L
217	Assuming Lognormal Distribution											
218					95% H-UCL	27.43				90% Chebyshev (MVUE) UCL		24.12
219				95% Chebyshev (MVUE) UCL		28.84				97.5% Chebyshev (MVUE) UCL		35.38
220				99% Chebyshev (MVUE) UCL		48.24						
221												
222	Nonparametric Distribution Free UCL Statistics											
223	Data do not follow a Discernible Distribution (0.05)											
224												
225	Nonparametric Distribution Free UCLs											
226					95% CLT UCL	13.73				95% Jackknife UCL		13.9
227				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
228				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
229				95% BCA Bootstrap UCL		N/A						
230				90% Chebyshev(Mean, Sd) UCL		15.27				95% Chebyshev(Mean, Sd) UCL		16.82
231				97.5% Chebyshev(Mean, Sd) UCL		18.97				99% Chebyshev(Mean, Sd) UCL		23.2
232												
233	Suggested UCL to Use											
234				95% Chebyshev (Mean, Sd) UCL		16.82						
235												
236	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
237	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
238	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
239	For additional insight the user may want to consult a statistician.											
240												
241	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
242	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
243												
244												

	A	B	C	D	E	F	G	H	I	J	K	L
245	Chromium											
246												
247					General Statistics							
248					Total Number of Observations	12			Number of Distinct Observations			9
249									Number of Missing Observations			0
250					Minimum	37.97			Mean			63.86
251					Maximum	97.61			Median			56.75
252					SD	22.13			Std. Error of Mean			6.389
253					Coefficient of Variation	0.347			Skewness			0.227
254												
255					Normal GOF Test							
256					Shapiro Wilk Test Statistic	0.852			Shapiro Wilk GOF Test			
257					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
258					Lilliefors Test Statistic	0.247			Lilliefors GOF Test			
259					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
260					Data appear Approximate Normal at 5% Significance Level							
261												
262					Assuming Normal Distribution							
263					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
264					95% Student's-t UCL	75.33			95% Adjusted-CLT UCL (Chen-1995)			74.81
265									95% Modified-t UCL (Johnson-1978)			75.4
266												
267					Gamma GOF Test							
268					A-D Test Statistic	0.818			Anderson-Darling Gamma GOF Test			
269					5% A-D Critical Value	0.731			Data Not Gamma Distributed at 5% Significance Level			
270					K-S Test Statistic	0.26			Kolmogrov-Smirnoff Gamma GOF Test			
271					5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level			
272					Data Not Gamma Distributed at 5% Significance Level							
273												
274					Gamma Statistics							
275					k hat (MLE)	8.972			k star (bias corrected MLE)			6.784
276					Theta hat (MLE)	7.118			Theta star (bias corrected MLE)			9.413
277					nu hat (MLE)	215.3			nu star (bias corrected)			162.8
278					MLE Mean (bias corrected)	63.86			MLE Sd (bias corrected)			24.52
279									Approximate Chi Square Value (0.05)			134.3
280					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			130.4
281												
282					Assuming Gamma Distribution							
283					95% Approximate Gamma UCL (use when n>=50))	77.41			95% Adjusted Gamma UCL (use when n<50)			79.75
284												
285					Lognormal GOF Test							
286					Shapiro Wilk Test Statistic	0.865			Shapiro Wilk Lognormal GOF Test			
287					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
288					Lilliefors Test Statistic	0.25			Lilliefors Lognormal GOF Test			
289					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
290					Data appear Lognormal at 5% Significance Level							
291												
292					Lognormal Statistics							
293					Minimum of Logged Data	3.637			Mean of logged Data			4.1
294					Maximum of Logged Data	4.581			SD of logged Data			0.354
295												

	A	B	C	D	E	F	G	H	I	J	K	L
296	Assuming Lognormal Distribution											
297					95% H-UCL	79.35				90% Chebyshev (MVUE) UCL		83.72
298				95% Chebyshev (MVUE) UCL		92.71				97.5% Chebyshev (MVUE) UCL		105.2
299				99% Chebyshev (MVUE) UCL		129.7						
300												
301	Nonparametric Distribution Free UCL Statistics											
302	Data appear to follow a Discernible Distribution at 5% Significance Level											
303												
304	Nonparametric Distribution Free UCLs											
305					95% CLT UCL	74.37				95% Jackknife UCL		75.33
306				95% Standard Bootstrap UCL		73.85				95% Bootstrap-t UCL		76.09
307				95% Hall's Bootstrap UCL		73.04				95% Percentile Bootstrap UCL		74.49
308				95% BCA Bootstrap UCL		74.64						
309				90% Chebyshev(Mean, Sd) UCL		83.03				95% Chebyshev(Mean, Sd) UCL		91.71
310				97.5% Chebyshev(Mean, Sd) UCL		103.8				99% Chebyshev(Mean, Sd) UCL		127.4
311												
312	Suggested UCL to Use											
313					95% Student's-t UCL	75.33						
314												
315	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
316	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
317	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
318	For additional insight the user may want to consult a statistician.											
319												
320												

	A	B	C	D	E	F	G	H	I	J	K	L
321	Iron											
322												
323					General Statistics							
324					Total Number of Observations	12			Number of Distinct Observations			12
325									Number of Missing Observations			0
326					Minimum	12854			Mean			24363
327					Maximum	39125			Median			23028
328					SD	7514			Std. Error of Mean			2169
329					Coefficient of Variation	0.308			Skewness			0.459
330												
331					Normal GOF Test							
332					Shapiro Wilk Test Statistic	0.965			Shapiro Wilk GOF Test			
333					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
334					Lilliefors Test Statistic	0.171			Lilliefors GOF Test			
335					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
336					Data appear Normal at 5% Significance Level							
337												
338					Assuming Normal Distribution							
339					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
340					95% Student's-t UCL	28258			95% Adjusted-CLT UCL (Chen-1995)			28238
341									95% Modified-t UCL (Johnson-1978)			28306
342												
343					Gamma GOF Test							
344					A-D Test Statistic	0.229			Anderson-Darling Gamma GOF Test			
345					5% A-D Critical Value	0.731			Detected data appear Gamma Distributed at 5% Significance Level			
346					K-S Test Statistic	0.166			Kolmogrov-Smirnoff Gamma GOF Test			
347					5% K-S Critical Value	0.245			Detected data appear Gamma Distributed at 5% Significance Level			
348					Detected data appear Gamma Distributed at 5% Significance Level							
349												
350					Gamma Statistics							
351					k hat (MLE)	11.32			k star (bias corrected MLE)			8.543
352					Theta hat (MLE)	2153			Theta star (bias corrected MLE)			2852
353					nu hat (MLE)	271.6			nu star (bias corrected)			205
354					MLE Mean (bias corrected)	24363			MLE Sd (bias corrected)			8335
355									Approximate Chi Square Value (0.05)			172.9
356					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			168.4
357												
358					Assuming Gamma Distribution							
359					95% Approximate Gamma UCL (use when n>=50))	28890			95% Adjusted Gamma UCL (use when n<50)			29663
360												
361					Lognormal GOF Test							
362					Shapiro Wilk Test Statistic	0.972			Shapiro Wilk Lognormal GOF Test			
363					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
364					Lilliefors Test Statistic	0.188			Lilliefors Lognormal GOF Test			
365					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
366					Data appear Lognormal at 5% Significance Level							
367												
368					Lognormal Statistics							
369					Minimum of Logged Data	9.461			Mean of logged Data			10.06
370					Maximum of Logged Data	10.57			SD of logged Data			0.317
371												

	A	B	C	D	E	F	G	H	I	J	K	L
372	Assuming Lognormal Distribution											
373					95% H-UCL	29498				90% Chebyshev (MVUE) UCL		31158
374					95% Chebyshev (MVUE) UCL	34223				97.5% Chebyshev (MVUE) UCL		38478
375					99% Chebyshev (MVUE) UCL	46836						
376												
377	Nonparametric Distribution Free UCL Statistics											
378	Data appear to follow a Discernible Distribution at 5% Significance Level											
379												
380	Nonparametric Distribution Free UCLs											
381					95% CLT UCL	27931				95% Jackknife UCL		28258
382					95% Standard Bootstrap UCL	27836				95% Bootstrap-t UCL		28903
383					95% Hall's Bootstrap UCL	28715				95% Percentile Bootstrap UCL		27700
384					95% BCA Bootstrap UCL	28161						
385					90% Chebyshev(Mean, Sd) UCL	30870				95% Chebyshev(Mean, Sd) UCL		33818
386					97.5% Chebyshev(Mean, Sd) UCL	37909				99% Chebyshev(Mean, Sd) UCL		45945
387												
388	Suggested UCL to Use											
389					95% Student's-t UCL	28258						
390												
391	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
392	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
393	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
394	For additional insight the user may want to consult a statistician.											
395												
396												

	A	B	C	D	E	F	G	H	I	J	K	L
397	Manganese											
398												
399					General Statistics							
400					Total Number of Observations	12	Number of Distinct Observations					12
401							Number of Missing Observations					0
402					Minimum	259	Mean					491.3
403					Maximum	934.6	Median					416.1
404					SD	215.1	Std. Error of Mean					62.09
405					Coefficient of Variation	0.438	Skewness					1.378
406												
407					Normal GOF Test							
408					Shapiro Wilk Test Statistic	0.823	**Shapiro Wilk GOF Test**					
409					5% Shapiro Wilk Critical Value	0.859	Data Not Normal at 5% Significance Level					
410					Lilliefors Test Statistic	0.245	**Lilliefors GOF Test**					
411					5% Lilliefors Critical Value	0.256	Data appear Normal at 5% Significance Level					
412					**Data appear Approximate Normal at 5% Significance Level**							
413												
414					Assuming Normal Distribution							
415					**95% Normal UCL**		**95% UCLs (Adjusted for Skewness)**					
416					95% Student's-t UCL	602.8	95% Adjusted-CLT UCL (Chen-1995)					619.8
417							95% Modified-t UCL (Johnson-1978)					606.9
418												
419					Gamma GOF Test							
420					A-D Test Statistic	0.586	**Anderson-Darling Gamma GOF Test**					
421					5% A-D Critical Value	0.731	Detected data appear Gamma Distributed at 5% Significance Level					
422					K-S Test Statistic	0.208	**Kolmogrov-Smirnoff Gamma GOF Test**					
423					5% K-S Critical Value	0.246	Detected data appear Gamma Distributed at 5% Significance Level					
424					**Detected data appear Gamma Distributed at 5% Significance Level**							
425												
426					Gamma Statistics							
427					k hat (MLE)	6.855	k star (bias corrected MLE)					5.197
428					Theta hat (MLE)	71.66	Theta star (bias corrected MLE)					94.53
429					nu hat (MLE)	164.5	nu star (bias corrected)					124.7
430					MLE Mean (bias corrected)	491.3	MLE Sd (bias corrected)					215.5
431							Approximate Chi Square Value (0.05)					99.93
432					Adjusted Level of Significance	0.029	Adjusted Chi Square Value					96.55
433												
434					Assuming Gamma Distribution							
435					95% Approximate Gamma UCL (use when n>=50))	613.1	95% Adjusted Gamma UCL (use when n<50)					634.6
436												
437					Lognormal GOF Test							
438					Shapiro Wilk Test Statistic	0.925	**Shapiro Wilk Lognormal GOF Test**					
439					5% Shapiro Wilk Critical Value	0.859	Data appear Lognormal at 5% Significance Level					
440					Lilliefors Test Statistic	0.182	**Lilliefors Lognormal GOF Test**					
441					5% Lilliefors Critical Value	0.256	Data appear Lognormal at 5% Significance Level					
442					**Data appear Lognormal at 5% Significance Level**							
443												
444					Lognormal Statistics							
445					Minimum of Logged Data	5.557	Mean of logged Data					6.122
446					Maximum of Logged Data	6.84	SD of logged Data					0.39
447												

	A	B	C	D	E	F	G	H	I	J	K	L
448					Assuming Lognormal Distribution							
449					95% H-UCL	623.3				90% Chebyshev (MVUE) UCL		656
450				95% Chebyshev (MVUE) UCL		731.8				97.5% Chebyshev (MVUE) UCL		837
451				99% Chebyshev (MVUE) UCL		1044						
452												
453					Nonparametric Distribution Free UCL Statistics							
454					Data appear to follow a Discernible Distribution at 5% Significance Level							
455												
456					Nonparametric Distribution Free UCLs							
457					95% CLT UCL	593.4				95% Jackknife UCL		602.8
458				95% Standard Bootstrap UCL		588.4				95% Bootstrap-t UCL		703.7
459				95% Hall's Bootstrap UCL		1193				95% Percentile Bootstrap UCL		598.8
460				95% BCA Bootstrap UCL		612.2						
461				90% Chebyshev(Mean, Sd) UCL		677.5				95% Chebyshev(Mean, Sd) UCL		761.9
462				97.5% Chebyshev(Mean, Sd) UCL		879				99% Chebyshev(Mean, Sd) UCL		1109
463												
464					Suggested UCL to Use							
465					95% Student's-t UCL	602.8						
466												
467					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
468					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
469					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
470					For additional insight the user may want to consult a statistician.							
471												
472												

	A	B	C	D	E	F	G	H	I	J	K	L
473	Mercury											
474												
475					General Statistics							
476					Total Number of Observations	12			Number of Distinct Observations			4
477									Number of Missing Observations			0
478					Minimum	0.021			Mean			9.091
479					Maximum	10.04			Median			10
480					SD	2.87			Std. Error of Mean			0.828
481					Coefficient of Variation	0.316			Skewness			-3.408
482												
483					Normal GOF Test							
484					Shapiro Wilk Test Statistic	0.372			Shapiro Wilk GOF Test			
485					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
486					Lilliefors Test Statistic	0.458			Lilliefors GOF Test			
487					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
488					Data Not Normal at 5% Significance Level							
489												
490					Assuming Normal Distribution							
491					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
492					95% Student's-t UCL	10.58			95% Adjusted-CLT UCL (Chen-1995)			9.583
493									95% Modified-t UCL (Johnson-1978)			10.44
494												
495					Gamma GOF Test							
496					A-D Test Statistic	4.242			Anderson-Darling Gamma GOF Test			
497					5% A-D Critical Value	0.75			Data Not Gamma Distributed at 5% Significance Level			
498					K-S Test Statistic	0.529			Kolmogrov-Smirnoff Gamma GOF Test			
499					5% K-S Critical Value	0.251			Data Not Gamma Distributed at 5% Significance Level			
500					Data Not Gamma Distributed at 5% Significance Level							
501												
502					Gamma Statistics							
503					k hat (MLE)	1.314			k star (bias corrected MLE)			1.041
504					Theta hat (MLE)	6.921			Theta star (bias corrected MLE)			8.735
505					nu hat (MLE)	31.52			nu star (bias corrected)			24.98
506					MLE Mean (bias corrected)	9.091			MLE Sd (bias corrected)			8.911
507									Approximate Chi Square Value (0.05)			14.59
508					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			13.4
509												
510					Assuming Gamma Distribution							
511					95% Approximate Gamma UCL (use when n>=50))	15.56			95% Adjusted Gamma UCL (use when n<50)			16.95
512												
513					Lognormal GOF Test							
514					Shapiro Wilk Test Statistic	0.335			Shapiro Wilk Lognormal GOF Test			
515					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
516					Lilliefors Test Statistic	0.51			Lilliefors Lognormal GOF Test			
517					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
518					Data Not Lognormal at 5% Significance Level							
519												
520					Lognormal Statistics							
521					Minimum of Logged Data	-3.863			Mean of logged Data			1.781
522					Maximum of Logged Data	2.307			SD of logged Data			1.778
523												

	A	B	C	D	E	F	G	H	I	J	K	L
524	Assuming Lognormal Distribution											
525					95% H-UCL	318				90% Chebyshev (MVUE) UCL		59.5
526				95% Chebyshev (MVUE) UCL		76.4				97.5% Chebyshev (MVUE) UCL		99.87
527				99% Chebyshev (MVUE) UCL		146						
528												
529	Nonparametric Distribution Free UCL Statistics											
530	Data do not follow a Discernible Distribution (0.05)											
531												
532	Nonparametric Distribution Free UCLs											
533					95% CLT UCL	10.45				95% Jackknife UCL		10.58
534				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
535				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
536				95% BCA Bootstrap UCL		N/A						
537				90% Chebyshev(Mean, Sd) UCL		11.58				95% Chebyshev(Mean, Sd) UCL		12.7
538				97.5% Chebyshev(Mean, Sd) UCL		14.26				99% Chebyshev(Mean, Sd) UCL		17.33
539												
540	Suggested UCL to Use											
541				99% Chebyshev (Mean, Sd) UCL		17.33						
542												
543	Recommended UCL exceeds the maximum observation											
544												
545	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
546	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
547	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
548	For additional insight the user may want to consult a statistician.											
549												
550	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
551	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
552												
553												

	A	B	C	D	E	F	G	H	I	J	K	L
554	Neptunium-237											
555												
556						General Statistics						
557					Total Number of Observations	12				Number of Distinct Observations		3
558										Number of Missing Observations		0
559					Minimum	0.013				Mean		0.189
560					Maximum	0.365				Median		0.189
561					SD	0.075				Std. Error of Mean		0.0217
562					Coefficient of Variation	0.397				Skewness		-1.34E-15
563												
564						Normal GOF Test						
565					Shapiro Wilk Test Statistic	0.6				Shapiro Wilk GOF Test		
566					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
567					Lilliefors Test Statistic	0.417				Lilliefors GOF Test		
568					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
569						Data Not Normal at 5% Significance Level						
570												
571						Assuming Normal Distribution						
572					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
573					95% Student's-t UCL	0.228				95% Adjusted-CLT UCL (Chen-1995)		0.225
574										95% Modified-t UCL (Johnson-1978)		0.228
575												
576						Gamma GOF Test						
577					A-D Test Statistic	3.03				Anderson-Darling Gamma GOF Test		
578					5% A-D Critical Value	0.739				Data Not Gamma Distributed at 5% Significance Level		
579					K-S Test Statistic	0.492				Kolmogrov-Smirnoff Gamma GOF Test		
580					5% K-S Critical Value	0.247				Data Not Gamma Distributed at 5% Significance Level		
581						Data Not Gamma Distributed at 5% Significance Level						
582												
583						Gamma Statistics						
584					k hat (MLE)	3.129				k star (bias corrected MLE)		2.402
585					Theta hat (MLE)	0.0604				Theta star (bias corrected MLE)		0.0787
586					nu hat (MLE)	75.1				nu star (bias corrected)		57.66
587					MLE Mean (bias corrected)	0.189				MLE Sd (bias corrected)		0.122
588										Approximate Chi Square Value (0.05)		41.2
589					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		39.09
590												
591						Assuming Gamma Distribution						
592					95% Approximate Gamma UCL (use when n>=50))	0.264				95% Adjusted Gamma UCL (use when n<50)		0.279
593												
594						Lognormal GOF Test						
595					Shapiro Wilk Test Statistic	0.459				Shapiro Wilk Lognormal GOF Test		
596					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
597					Lilliefors Test Statistic	0.499				Lilliefors Lognormal GOF Test		
598					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
599						Data Not Lognormal at 5% Significance Level						
600												
601						Lognormal Statistics						
602					Minimum of Logged Data	-4.343				Mean of logged Data		-1.834
603					Maximum of Logged Data	-1.008				SD of logged Data		0.812
604												

	A	B	C	D	E	F	G	H	I	J	K	L
605					Assuming Lognormal Distribution							
606					95% H-UCL	0.419				90% Chebyshev (MVUE) UCL		0.374
607				95% Chebyshev (MVUE) UCL		0.446				97.5% Chebyshev (MVUE) UCL		0.546
608				99% Chebyshev (MVUE) UCL		0.742						
609												
610					Nonparametric Distribution Free UCL Statistics							
611					Data do not follow a Discernible Distribution (0.05)							
612												
613					Nonparametric Distribution Free UCLs							
614					95% CLT UCL	0.225				95% Jackknife UCL		0.228
615				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
616				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
617				95% BCA Bootstrap UCL		N/A						
618				90% Chebyshev(Mean, Sd) UCL		0.254				95% Chebyshev(Mean, Sd) UCL		0.283
619				97.5% Chebyshev(Mean, Sd) UCL		0.324				99% Chebyshev(Mean, Sd) UCL		0.405
620												
621					Suggested UCL to Use							
622				95% Chebyshev (Mean, Sd) UCL		0.283						
623												
624	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
625	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
626	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
627	For additional insight the user may want to consult a statistician.											
628												
629	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
630	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
631												
632												

	A	B	C	D	E	F	G	H	I	J	K	L
633	Nickel											
634												
635					General Statistics							
636					Total Number of Observations	12			Number of Distinct Observations			11
637									Number of Missing Observations			0
638					Minimum	65			Mean			142.6
639					Maximum	318.1			Median			127.8
640					SD	76.52			Std. Error of Mean			22.09
641					Coefficient of Variation	0.537			Skewness			1.221
642												
643					Normal GOF Test							
644					Shapiro Wilk Test Statistic	0.888			Shapiro Wilk GOF Test			
645					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
646					Lilliefors Test Statistic	0.183			Lilliefors GOF Test			
647					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
648					Data appear Normal at 5% Significance Level							
649												
650					Assuming Normal Distribution							
651					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
652					95% Student's-t UCL	182.3			95% Adjusted-CLT UCL (Chen-1995)			187.2
653									95% Modified-t UCL (Johnson-1978)			183.6
654												
655					Gamma GOF Test							
656					A-D Test Statistic	0.255			Anderson-Darling Gamma GOF Test			
657					5% A-D Critical Value	0.735			Detected data appear Gamma Distributed at 5% Significance Level			
658					K-S Test Statistic	0.135			Kolmogrov-Smirnoff Gamma GOF Test			
659					5% K-S Critical Value	0.246			Detected data appear Gamma Distributed at 5% Significance Level			
660					Detected data appear Gamma Distributed at 5% Significance Level							
661												
662					Gamma Statistics							
663					k hat (MLE)	4.327			k star (bias corrected MLE)			3.301
664					Theta hat (MLE)	32.95			Theta star (bias corrected MLE)			43.2
665					nu hat (MLE)	103.8			nu star (bias corrected)			79.22
666					MLE Mean (bias corrected)	142.6			MLE Sd (bias corrected)			78.48
667									Approximate Chi Square Value (0.05)			59.71
668					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			57.14
669												
670					Assuming Gamma Distribution							
671					95% Approximate Gamma UCL (use when n>=50))	189.2			95% Adjusted Gamma UCL (use when n<50)			197.7
672												
673					Lognormal GOF Test							
674					Shapiro Wilk Test Statistic	0.961			Shapiro Wilk Lognormal GOF Test			
675					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
676					Lilliefors Test Statistic	0.114			Lilliefors Lognormal GOF Test			
677					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
678					Data appear Lognormal at 5% Significance Level							
679												
680					Lognormal Statistics							
681					Minimum of Logged Data	4.174			Mean of logged Data			4.84
682					Maximum of Logged Data	5.762			SD of logged Data			0.504
683												

	A	B	C	D	E	F	G	H	I	J	K	L
684					Assuming Lognormal Distribution							
685					95% H-UCL	199.1				90% Chebyshev (MVUE) UCL		205.5
686				95% Chebyshev (MVUE) UCL		234.2				97.5% Chebyshev (MVUE) UCL		274.2
687				99% Chebyshev (MVUE) UCL		352.6						
688												
689					Nonparametric Distribution Free UCL Statistics							
690					Data appear to follow a Discernible Distribution at 5% Significance Level							
691												
692					Nonparametric Distribution Free UCLs							
693					95% CLT UCL	178.9				95% Jackknife UCL		182.3
694				95% Standard Bootstrap UCL		177.6				95% Bootstrap-t UCL		198.8
695				95% Hall's Bootstrap UCL		207.9				95% Percentile Bootstrap UCL		176.6
696				95% BCA Bootstrap UCL		187.2						
697				90% Chebyshev(Mean, Sd) UCL		208.9				95% Chebyshev(Mean, Sd) UCL		238.9
698				97.5% Chebyshev(Mean, Sd) UCL		280.5				99% Chebyshev(Mean, Sd) UCL		362.4
699												
700					Suggested UCL to Use							
701					95% Student's-t UCL	182.3						
702												
703	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
704	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
705	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
706	For additional insight the user may want to consult a statistician.											
707												
708												

	A	B	C	D	E	F	G	H	I	J	K	L
709	PAH, Total											
710												
711						General Statistics						
712					Total Number of Observations	12				Number of Distinct Observations		3
713										Number of Missing Observations		0
714					Minimum	0.018				Mean		0.188
715					Maximum	0.359				Median		0.188
716					SD	0.0727				Std. Error of Mean		0.021
717					Coefficient of Variation	0.386				Skewness		-4.93E-16
718												
719						Normal GOF Test						
720					Shapiro Wilk Test Statistic	0.6				Shapiro Wilk GOF Test		
721					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
722					Lilliefors Test Statistic	0.417				Lilliefors GOF Test		
723					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
724						Data Not Normal at 5% Significance Level						
725												
726						Assuming Normal Distribution						
727					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
728					95% Student's-t UCL	0.226				95% Adjusted-CLT UCL (Chen-1995)		0.223
729										95% Modified-t UCL (Johnson-1978)		0.226
730												
731						Gamma GOF Test						
732					A-D Test Statistic	2.982				Anderson-Darling Gamma GOF Test		
733					5% A-D Critical Value	0.737				Data Not Gamma Distributed at 5% Significance Level		
734					K-S Test Statistic	0.486				Kolmogrov-Smirnoff Gamma GOF Test		
735					5% K-S Critical Value	0.247				Data Not Gamma Distributed at 5% Significance Level		
736						Data Not Gamma Distributed at 5% Significance Level						
737												
738						Gamma Statistics						
739					k hat (MLE)	3.68				k star (bias corrected MLE)		2.815
740					Theta hat (MLE)	0.0512				Theta star (bias corrected MLE)		0.0669
741					nu hat (MLE)	88.31				nu star (bias corrected)		67.57
742					MLE Mean (bias corrected)	0.188				MLE Sd (bias corrected)		0.112
743										Approximate Chi Square Value (0.05)		49.65
744					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		47.31
745												
746						Assuming Gamma Distribution						
747					95% Approximate Gamma UCL (use when n>=50))	0.256				95% Adjusted Gamma UCL (use when n<50)		0.269
748												
749						Lognormal GOF Test						
750					Shapiro Wilk Test Statistic	0.472				Shapiro Wilk Lognormal GOF Test		
751					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
752					Lilliefors Test Statistic	0.495				Lilliefors Lognormal GOF Test		
753					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
754						Data Not Lognormal at 5% Significance Level						
755												
756						Lognormal Statistics						
757					Minimum of Logged Data	-4.017				Mean of logged Data		-1.811
758					Maximum of Logged Data	-1.025				SD of logged Data		0.719
759												

	A	B	C	D	E	F	G	H	I	J	K	L
760					Assuming Lognormal Distribution							
761					95% H-UCL	0.359				90% Chebyshev (MVUE) UCL		0.34
762				95% Chebyshev (MVUE) UCL		0.401				97.5% Chebyshev (MVUE) UCL		0.485
763				99% Chebyshev (MVUE) UCL		0.651						
764												
765					Nonparametric Distribution Free UCL Statistics							
766					Data do not follow a Discernible Distribution (0.05)							
767												
768					Nonparametric Distribution Free UCLs							
769					95% CLT UCL	0.223				95% Jackknife UCL		0.226
770				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
771				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
772				95% BCA Bootstrap UCL		N/A						
773				90% Chebyshev(Mean, Sd) UCL		0.251				95% Chebyshev(Mean, Sd) UCL		0.28
774				97.5% Chebyshev(Mean, Sd) UCL		0.319				99% Chebyshev(Mean, Sd) UCL		0.397
775												
776					Suggested UCL to Use							
777				95% Chebyshev (Mean, Sd) UCL		0.28						
778												
779	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
780	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
781	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
782	For additional insight the user may want to consult a statistician.											
783												
784	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
785	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
786												

	A	B	C	D	E	F	G	H	I	J	K	L
787	PCB, Total											
788												
789						General Statistics						
790					Total Number of Observations	12				Number of Distinct Observations		3
791										Number of Missing Observations		0
792					Minimum	0.36				Mean		4.605
793					Maximum	5				Median		5
794					SD	1.337				Std. Error of Mean		0.386
795					Coefficient of Variation	0.29				Skewness		-3.461
796												
797						Normal GOF Test						
798					Shapiro Wilk Test Statistic	0.337				Shapiro Wilk GOF Test		
799					5% Shapiro Wilk Critical Value	0.859				Data Not Normal at 5% Significance Level		
800					Lilliefors Test Statistic	0.504				Lilliefors GOF Test		
801					5% Lilliefors Critical Value	0.256				Data Not Normal at 5% Significance Level		
802						Data Not Normal at 5% Significance Level						
803												
804						Assuming Normal Distribution						
805					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
806					95% Student's-t UCL	5.298				95% Adjusted-CLT UCL (Chen-1995)		4.828
807										95% Modified-t UCL (Johnson-1978)		5.234
808												
809						Gamma GOF Test						
810					A-D Test Statistic	4.112				Anderson-Darling Gamma GOF Test		
811					5% A-D Critical Value	0.737				Data Not Gamma Distributed at 5% Significance Level		
812					K-S Test Statistic	0.532				Kolmogrov-Smirnoff Gamma GOF Test		
813					5% K-S Critical Value	0.247				Data Not Gamma Distributed at 5% Significance Level		
814						Data Not Gamma Distributed at 5% Significance Level						
815												
816						Gamma Statistics						
817					k hat (MLE)	3.765				k star (bias corrected MLE)		2.879
818					Theta hat (MLE)	1.223				Theta star (bias corrected MLE)		1.599
819					nu hat (MLE)	90.36				nu star (bias corrected)		69.1
820					MLE Mean (bias corrected)	4.605				MLE Sd (bias corrected)		2.714
821										Approximate Chi Square Value (0.05)		50.97
822					Adjusted Level of Significance	0.029				Adjusted Chi Square Value		48.6
823												
824						Assuming Gamma Distribution						
825					95% Approximate Gamma UCL (use when n>=50))	6.244				95% Adjusted Gamma UCL (use when n<50)		6.548
826												
827						Lognormal GOF Test						
828					Shapiro Wilk Test Statistic	0.331				Shapiro Wilk Lognormal GOF Test		
829					5% Shapiro Wilk Critical Value	0.859				Data Not Lognormal at 5% Significance Level		
830					Lilliefors Test Statistic	0.521				Lilliefors Lognormal GOF Test		
831					5% Lilliefors Critical Value	0.256				Data Not Lognormal at 5% Significance Level		
832						Data Not Lognormal at 5% Significance Level						
833												
834						Lognormal Statistics						
835					Minimum of Logged Data	-1.022				Mean of logged Data		1.388
836					Maximum of Logged Data	1.609				SD of logged Data		0.759
837												

	A	B	C	D	E	F	G	H	I	J	K	L
838						Assuming Lognormal Distribution						
839					95% H-UCL	9.485				90% Chebyshev (MVUE) UCL		8.77
840				95% Chebyshev (MVUE) UCL		10.39				97.5% Chebyshev (MVUE) UCL		12.64
841				99% Chebyshev (MVUE) UCL		17.05						
842												
843						Nonparametric Distribution Free UCL Statistics						
844						Data do not follow a Discernible Distribution (0.05)						
845												
846						Nonparametric Distribution Free UCLs						
847					95% CLT UCL	5.24				95% Jackknife UCL		5.298
848				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
849				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
850				95% BCA Bootstrap UCL		N/A						
851				90% Chebyshev(Mean, Sd) UCL		5.763				95% Chebyshev(Mean, Sd) UCL		6.288
852				97.5% Chebyshev(Mean, Sd) UCL		7.016				99% Chebyshev(Mean, Sd) UCL		8.446
853												
854						Suggested UCL to Use						
855				95% Chebyshev (Mean, Sd) UCL		6.288						
856												
857						Recommended UCL exceeds the maximum observation						
858												
859						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
860						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
861						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
862						For additional insight the user may want to consult a statistician.						
863												
864						Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be						
865						reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.						
866												
867												

	A	B	C	D	E	F	G	H	I	J	K	L
868	Uranium											
869												
870					General Statistics							
871					Total Number of Observations	12			Number of Distinct Observations			12
872									Number of Missing Observations			0
873					Minimum	7.69			Mean			33.27
874					Maximum	81.68			Median			28.85
875					SD	21.75			Std. Error of Mean			6.279
876					Coefficient of Variation	0.654			Skewness			0.994
877												
878					Normal GOF Test							
879					Shapiro Wilk Test Statistic	0.921			Shapiro Wilk GOF Test			
880					5% Shapiro Wilk Critical Value	0.859			Data appear Normal at 5% Significance Level			
881					Lilliefors Test Statistic	0.162			Lilliefors GOF Test			
882					5% Lilliefors Critical Value	0.256			Data appear Normal at 5% Significance Level			
883					Data appear Normal at 5% Significance Level							
884												
885					Assuming Normal Distribution							
886					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
887					95% Student's-t UCL	44.55			95% Adjusted-CLT UCL (Chen-1995)			45.52
888									95% Modified-t UCL (Johnson-1978)			44.85
889												
890					Gamma GOF Test							
891					A-D Test Statistic	0.176			Anderson-Darling Gamma GOF Test			
892					5% A-D Critical Value	0.74			Detected data appear Gamma Distributed at 5% Significance Level			
893					K-S Test Statistic	0.114			Kolmogrov-Smirnoff Gamma GOF Test			
894					5% K-S Critical Value	0.248			Detected data appear Gamma Distributed at 5% Significance Level			
895					Detected data appear Gamma Distributed at 5% Significance Level							
896												
897					Gamma Statistics							
898					k hat (MLE)	2.517			k star (bias corrected MLE)			1.944
899					Theta hat (MLE)	13.22			Theta star (bias corrected MLE)			17.12
900					nu hat (MLE)	60.42			nu star (bias corrected)			46.65
901					MLE Mean (bias corrected)	33.27			MLE Sd (bias corrected)			23.86
902									Approximate Chi Square Value (0.05)			31.98
903					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			30.13
904												
905					Assuming Gamma Distribution							
906					95% Approximate Gamma UCL (use when n>=50))	48.53			95% Adjusted Gamma UCL (use when n<50)			51.51
907												
908					Lognormal GOF Test							
909					Shapiro Wilk Test Statistic	0.972			Shapiro Wilk Lognormal GOF Test			
910					5% Shapiro Wilk Critical Value	0.859			Data appear Lognormal at 5% Significance Level			
911					Lilliefors Test Statistic	0.13			Lilliefors Lognormal GOF Test			
912					5% Lilliefors Critical Value	0.256			Data appear Lognormal at 5% Significance Level			
913					Data appear Lognormal at 5% Significance Level							
914												
915					Lognormal Statistics							
916					Minimum of Logged Data	2.04			Mean of logged Data			3.293
917					Maximum of Logged Data	4.403			SD of logged Data			0.709
918												

	A	B	C	D	E	F	G	H	I	J	K	L
919	Assuming Lognormal Distribution											
920					95% H-UCL	58.18				90% Chebyshev (MVUE) UCL		55.4
921				95% Chebyshev (MVUE) UCL		65.19				97.5% Chebyshev (MVUE) UCL		78.79
922				99% Chebyshev (MVUE) UCL		105.5						
923												
924	Nonparametric Distribution Free UCL Statistics											
925	Data appear to follow a Discernible Distribution at 5% Significance Level											
926												
927	Nonparametric Distribution Free UCLs											
928					95% CLT UCL	43.6				95% Jackknife UCL		44.55
929				95% Standard Bootstrap UCL		42.91				95% Bootstrap-t UCL		48
930				95% Hall's Bootstrap UCL		50.73				95% Percentile Bootstrap UCL		43.53
931				95% BCA Bootstrap UCL		44.92						
932				90% Chebyshev(Mean, Sd) UCL		52.11				95% Chebyshev(Mean, Sd) UCL		60.64
933				97.5% Chebyshev(Mean, Sd) UCL		72.48				99% Chebyshev(Mean, Sd) UCL		95.75
934												
935	Suggested UCL to Use											
936				95% Student's-t UCL		44.55						
937												
938	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
939	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
940	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
941	For additional insight the user may want to consult a statistician.											
942												
943												

	A	B	C	D	E	F	G	H	I	J	K	L
944	Uranium-238											
945												
946					General Statistics							
947					Total Number of Observations	12			Number of Distinct Observations			3
948									Number of Missing Observations			0
949					Minimum	1.2			Mean			3.92
950					Maximum	6.64			Median			3.92
951					SD	1.16			Std. Error of Mean			0.335
952					Coefficient of Variation	0.296			Skewness			-1.99E-15
953												
954					Normal GOF Test							
955					Shapiro Wilk Test Statistic	0.6			Shapiro Wilk GOF Test			
956					5% Shapiro Wilk Critical Value	0.859			Data Not Normal at 5% Significance Level			
957					Lilliefors Test Statistic	0.417			Lilliefors GOF Test			
958					5% Lilliefors Critical Value	0.256			Data Not Normal at 5% Significance Level			
959					Data Not Normal at 5% Significance Level							
960												
961					Assuming Normal Distribution							
962					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
963					95% Student's-t UCL	4.521			95% Adjusted-CLT UCL (Chen-1995)			4.471
964									95% Modified-t UCL (Johnson-1978)			4.521
965												
966					Gamma GOF Test							
967					A-D Test Statistic	2.817			Anderson-Darling Gamma GOF Test			
968					5% A-D Critical Value	0.731			Data Not Gamma Distributed at 5% Significance Level			
969					K-S Test Statistic	0.46			Kolmogrov-Smirnoff Gamma GOF Test			
970					5% K-S Critical Value	0.245			Data Not Gamma Distributed at 5% Significance Level			
971					Data Not Gamma Distributed at 5% Significance Level							
972												
973					Gamma Statistics							
974					k hat (MLE)	9.299			k star (bias corrected MLE)			7.03
975					Theta hat (MLE)	0.422			Theta star (bias corrected MLE)			0.558
976					nu hat (MLE)	223.2			nu star (bias corrected)			168.7
977					MLE Mean (bias corrected)	3.92			MLE Sd (bias corrected)			1.478
978									Approximate Chi Square Value (0.05)			139.7
979					Adjusted Level of Significance	0.029			Adjusted Chi Square Value			135.7
980												
981					Assuming Gamma Distribution							
982					95% Approximate Gamma UCL (use when n>=50))	4.735			95% Adjusted Gamma UCL (use when n<50)			4.875
983												
984					Lognormal GOF Test							
985					Shapiro Wilk Test Statistic	0.534			Shapiro Wilk Lognormal GOF Test			
986					5% Shapiro Wilk Critical Value	0.859			Data Not Lognormal at 5% Significance Level			
987					Lilliefors Test Statistic	0.473			Lilliefors Lognormal GOF Test			
988					5% Lilliefors Critical Value	0.256			Data Not Lognormal at 5% Significance Level			
989					Data Not Lognormal at 5% Significance Level							
990												
991					Lognormal Statistics							
992					Minimum of Logged Data	0.182			Mean of logged Data			1.311
993					Maximum of Logged Data	1.893			SD of logged Data			0.386
994												

	A	B	C	D	E	F	G	H	I	J	K	L
995					Assuming Lognormal Distribution							
996					95% H-UCL	5.056				90% Chebyshev (MVUE) UCL		5.322
997				95% Chebyshev (MVUE) UCL		5.933				97.5% Chebyshev (MVUE) UCL		6.782
998				99% Chebyshev (MVUE) UCL		8.448						
999												
1000					Nonparametric Distribution Free UCL Statistics							
1001					Data do not follow a Discernible Distribution (0.05)							
1002												
1003					Nonparametric Distribution Free UCLs							
1004					95% CLT UCL	4.471				95% Jackknife UCL		4.521
1005				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
1006				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
1007				95% BCA Bootstrap UCL		N/A						
1008				90% Chebyshev(Mean, Sd) UCL		4.924				95% Chebyshev(Mean, Sd) UCL		5.379
1009				97.5% Chebyshev(Mean, Sd) UCL		6.011				99% Chebyshev(Mean, Sd) UCL		7.251
1010												
1011					Suggested UCL to Use							
1012					95% Student's-t UCL	4.521				or 95% Modified-t UCL		4.521
1013												
1014					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1015					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1016					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1017					For additional insight the user may want to consult a statistician.							
1018												
1019					Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be							
1020					reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.							
1021												