	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			2/20/2015 2:16:07 PM								
5	From File			EPC_026Sub_EU03.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	Aluminum											
12												
13						General Statistics						
14					Total Number of Observations	10				Number of Distinct Observations		6
15										Number of Missing Observations		0
16					Minimum	4140				Mean		7970
17					Maximum	13500				Median		7970
18					SD	2291				Std. Error of Mean		724.5
19					Coefficient of Variation	0.287				Skewness		1.281
20												
21						Normal GOF Test						
22					Shapiro Wilk Test Statistic	0.761				Shapiro Wilk GOF Test		
23					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
24					Lilliefors Test Statistic	0.36				Lilliefors GOF Test		
25					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
26						Data Not 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	9298				95% Adjusted-CLT UCL (Chen-1995)		9475
31										95% Modified-t UCL (Johnson-1978)		9347
32												
33						Gamma GOF Test						
34					A-D Test Statistic	1.18				Anderson-Darling Gamma GOF Test		
35					5% A-D Critical Value	0.725				Data Not Gamma Distributed at 5% Significance Level		
36					K-S Test Statistic	0.322				Kolmogrov-Smirnoff Gamma GOF Test		
37					5% K-S Critical Value	0.266				Data Not Gamma Distributed at 5% Significance Level		
38						Data Not Gamma Distributed at 5% Significance Level						
39												
40						Gamma Statistics						
41					k hat (MLE)	14.11				k star (bias corrected MLE)		9.947
42					Theta hat (MLE)	564.7				Theta star (bias corrected MLE)		801.3
43					nu hat (MLE)	282.3				nu star (bias corrected)		198.9
44					MLE Mean (bias corrected)	7970				MLE Sd (bias corrected)		2527
45										Approximate Chi Square Value (0.05)		167.3
46					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		162.3
47												
48						Assuming Gamma Distribution						
49					95% Approximate Gamma UCL (use when n>=50))	9477				95% Adjusted Gamma UCL (use when n<50)		9771
50												
51						Lognormal GOF Test						
52					Shapiro Wilk Test Statistic	0.794				Shapiro Wilk Lognormal GOF Test		
53					5% Shapiro Wilk Critical Value	0.842				Data Not Lognormal at 5% Significance Level		
54					Lilliefors Test Statistic	0.311				Lilliefors Lognormal GOF Test		
55					5% Lilliefors Critical Value	0.28				Data Not Lognormal at 5% Significance Level		
56						Data Not Lognormal at 5% Significance Level						
57												
58						Lognormal Statistics						
59					Minimum of Logged Data	8.328				Mean of logged Data		8.948
60					Maximum of Logged Data	9.51				SD of logged Data		0.285
61												

	A	B	C	D	E	F	G	H	I	J	K	L
62					Assuming Lognormal Distribution							
63					95% H-UCL	9646				90% Chebyshev (MVUE) UCL		10142
64					95% Chebyshev (MVUE) UCL	11124				97.5% Chebyshev (MVUE) UCL		12487
65					99% Chebyshev (MVUE) UCL	15164						
66												
67					Nonparametric Distribution Free UCL Statistics							
68					Data do not follow a Discernible Distribution (0.05)							
69												
70					Nonparametric Distribution Free UCLs							
71					95% CLT UCL	9162				95% Jackknife UCL		9298
72					95% Standard Bootstrap UCL	9111				95% Bootstrap-t UCL		9608
73					95% Hall's Bootstrap UCL	16577				95% Percentile Bootstrap UCL		9153
74					95% BCA Bootstrap UCL	9552						
75					90% Chebyshev(Mean, Sd) UCL	10144				95% Chebyshev(Mean, Sd) UCL		11128
76					97.5% Chebyshev(Mean, Sd) UCL	12495				99% Chebyshev(Mean, Sd) UCL		15179
77												
78					Suggested UCL to Use							
79					95% Student's-t UCL	9298				or 95% Modified-t UCL		9347
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	Antimony											
88												
89						General Statistics						
90					Total Number of Observations	10				Number of Distinct Observations		10
91										Number of Missing Observations		0
92					Minimum	1.4				Mean		52.9
93					Maximum	87.16				Median		53.32
94					SD	25.87				Std. Error of Mean		8.182
95					Coefficient of Variation	0.489				Skewness		-0.514
96												
97						Normal GOF Test						
98					Shapiro Wilk Test Statistic	0.944				Shapiro Wilk GOF Test		
99					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
100					Lilliefors Test Statistic	0.154				Lilliefors GOF Test		
101					5% Lilliefors Critical Value	0.28				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	67.9				95% Adjusted-CLT UCL (Chen-1995)		64.94
107										95% Modified-t UCL (Johnson-1978)		67.68
108												
109						Gamma GOF Test						
110					A-D Test Statistic	1.083				Anderson-Darling Gamma GOF Test		
111					5% A-D Critical Value	0.738				Data Not Gamma Distributed at 5% Significance Level		
112					K-S Test Statistic	0.28				Kolmogrov-Smirnoff Gamma GOF Test		
113					5% K-S Critical Value	0.271				Data Not Gamma Distributed at 5% Significance Level		
114						Data Not Gamma Distributed at 5% Significance Level						
115												
116						Gamma Statistics						
117					k hat (MLE)	1.724				k star (bias corrected MLE)		1.273
118					Theta hat (MLE)	30.69				Theta star (bias corrected MLE)		41.54
119					nu hat (MLE)	34.48				nu star (bias corrected)		25.47
120					MLE Mean (bias corrected)	52.9				MLE Sd (bias corrected)		46.88
121										Approximate Chi Square Value (0.05)		14.97
122					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		13.59
123												
124						Assuming Gamma Distribution						
125					95% Approximate Gamma UCL (use when n>=50))	90				95% Adjusted Gamma UCL (use when n<50)		99.14
126												
127						Lognormal GOF Test						
128					Shapiro Wilk Test Statistic	0.62				Shapiro Wilk Lognormal GOF Test		
129					5% Shapiro Wilk Critical Value	0.842				Data Not Lognormal at 5% Significance Level		
130					Lilliefors Test Statistic	0.323				Lilliefors Lognormal GOF Test		
131					5% Lilliefors Critical Value	0.28				Data Not Lognormal at 5% Significance Level		
132						Data Not Lognormal at 5% Significance Level						
133												
134						Lognormal Statistics						
135					Minimum of Logged Data	0.336				Mean of logged Data		3.651
136					Maximum of Logged Data	4.468				SD of logged Data		1.21
137												

	A	B	C	D	E	F	G	H	I	J	K	L
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	334.8				90% Chebyshev (MVUE) UCL		158.9
140				95% Chebyshev (MVUE) UCL		198.3				97.5% Chebyshev (MVUE) UCL		253.1
141				99% Chebyshev (MVUE) UCL		360.6						
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	66.36				95% Jackknife UCL		67.9
148				95% Standard Bootstrap UCL		65.57				95% Bootstrap-t UCL		66.6
149				95% Hall's Bootstrap UCL		66.88				95% Percentile Bootstrap UCL		65.58
150				95% BCA Bootstrap UCL		63.93						
151				90% Chebyshev(Mean, Sd) UCL		77.45				95% Chebyshev(Mean, Sd) UCL		88.56
152				97.5% Chebyshev(Mean, Sd) UCL		104				99% Chebyshev(Mean, Sd) UCL		134.3
153												
154	**Suggested UCL to Use**											
155				95% Student's-t UCL		67.9						
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	Arsenic											
167												
168					General Statistics							
169					Total Number of Observations	10			Number of Distinct Observations			8
170									Number of Missing Observations			0
171					Minimum	4.66			Mean			22.04
172					Maximum	130.4			Median			9.62
173					SD	38.54			Std. Error of Mean			12.19
174					Coefficient of Variation	1.749			Skewness			3.025
175												
176					Normal GOF Test							
177					Shapiro Wilk Test Statistic	0.485			Shapiro Wilk GOF Test			
178					5% Shapiro Wilk Critical Value	0.842			Data Not Normal at 5% Significance Level			
179					Lilliefors Test Statistic	0.413			Lilliefors GOF Test			
180					5% Lilliefors Critical Value	0.28			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	44.38			95% Adjusted-CLT UCL (Chen-1995)			54.54
186									95% Modified-t UCL (Johnson-1978)			46.32
187												
188					Gamma GOF Test							
189					A-D Test Statistic	1.484			Anderson-Darling Gamma GOF Test			
190					5% A-D Critical Value	0.752			Data Not Gamma Distributed at 5% Significance Level			
191					K-S Test Statistic	0.386			Kolmogrov-Smirnoff Gamma GOF Test			
192					5% K-S Critical Value	0.275			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)	0.893			k star (bias corrected MLE)			0.692
197					Theta hat (MLE)	24.68			Theta star (bias corrected MLE)			31.86
198					nu hat (MLE)	17.86			nu star (bias corrected)			13.84
199					MLE Mean (bias corrected)	22.04			MLE Sd (bias corrected)			26.5
200									Approximate Chi Square Value (0.05)			6.459
201					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value			5.607
202												
203					Assuming Gamma Distribution							
204					95% Approximate Gamma UCL (use when n>=50))	47.21			95% Adjusted Gamma UCL (use when n<50)			54.39
205												
206					Lognormal GOF Test							
207					Shapiro Wilk Test Statistic	0.788			Shapiro Wilk Lognormal GOF Test			
208					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level			
209					Lilliefors Test Statistic	0.316			Lilliefors Lognormal GOF Test			
210					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
211					Data Not Lognormal at 5% Significance Level							
212												
213					Lognormal Statistics							
214					Minimum of Logged Data	1.539			Mean of logged Data			2.438
215					Maximum of Logged Data	4.87			SD of logged Data			0.985
216												

	A	B	C	D	E	F	G	H	I	J	K	L
217	Assuming Lognormal Distribution											
218					95% H-UCL	50.97				90% Chebyshev (MVUE) UCL		34.5
219				95% Chebyshev (MVUE) UCL		42.23				97.5% Chebyshev (MVUE) UCL		52.96
220				99% Chebyshev (MVUE) UCL		74.03						
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	42.09				95% Jackknife UCL		44.38
227				95% Standard Bootstrap UCL		40.7				95% Bootstrap-t UCL		235.6
228				95% Hall's Bootstrap UCL		154.7				95% Percentile Bootstrap UCL		45.48
229				95% BCA Bootstrap UCL		58.71						
230				90% Chebyshev(Mean, Sd) UCL		58.6				95% Chebyshev(Mean, Sd) UCL		75.17
231				97.5% Chebyshev(Mean, Sd) UCL		98.15				99% Chebyshev(Mean, Sd) UCL		143.3
232												
233	Suggested UCL to Use											
234				95% Chebyshev (Mean, Sd) UCL		75.17						
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												

	A	B	C	D	E	F	G	H	I	J	K	L
242	Cesium-137											
243												
244						General Statistics						
245					Total Number of Observations	10				Number of Distinct Observations		6
246										Number of Missing Observations		0
247					Minimum	-0.06				Mean		1.198
248					Maximum	5.43				Median		1.198
249					SD	1.582				Std. Error of Mean		0.5
250					Coefficient of Variation	1.32				Skewness		2.481
251												
252						Normal GOF Test						
253					Shapiro Wilk Test Statistic	0.658				Shapiro Wilk GOF Test		
254					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
255					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
256					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
257						Data Not Normal at 5% Significance Level						
258												
259						Assuming Normal Distribution						
260					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
261					95% Student's-t UCL	2.115				95% Adjusted-CLT UCL (Chen-1995)		2.44
262										95% Modified-t UCL (Johnson-1978)		2.18
263						Gamma Statistics Not Available						
264						Lognormal Statistics Not Available						
265												
266						Nonparametric Distribution Free UCL Statistics						
267						Data do not follow a Discernible Distribution (0.05)						
268												
269						Nonparametric Distribution Free UCLs						
270					95% CLT UCL	2.021				95% Jackknife UCL		2.115
271					95% Standard Bootstrap UCL	1.955				95% Bootstrap-t UCL		3
272					95% Hall's Bootstrap UCL	5.329				95% Percentile Bootstrap UCL		2.124
273					95% BCA Bootstrap UCL	2.368						
274					90% Chebyshev(Mean, Sd) UCL	2.698				95% Chebyshev(Mean, Sd) UCL		3.378
275					97.5% Chebyshev(Mean, Sd) UCL	4.321				99% Chebyshev(Mean, Sd) UCL		6.174
276												
277						Suggested UCL to Use						
278					95% Chebyshev (Mean, Sd) UCL	3.378						
279												
280						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
281						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
282						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
283						For additional insight the user may want to consult a statistician.						
284												
285												

	A	B	C	D	E	F	G	H	I	J	K	L
286	Chromium											
287												
288						General Statistics						
289					Total Number of Observations	10				Number of Distinct Observations		8
290										Number of Missing Observations		0
291					Minimum	12.7				Mean		47.11
292					Maximum	85				Median		36.15
293					SD	30.34				Std. Error of Mean		9.596
294					Coefficient of Variation	0.644				Skewness		0.31
295												
296						Normal GOF Test						
297					Shapiro Wilk Test Statistic	0.844				Shapiro Wilk GOF Test		
298					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
299					Lilliefors Test Statistic	0.205				Lilliefors GOF Test		
300					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
301						Data appear Normal at 5% Significance Level						
302												
303						Assuming Normal Distribution						
304					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
305					95% Student's-t UCL	64.7				95% Adjusted-CLT UCL (Chen-1995)		63.9
306										95% Modified-t UCL (Johnson-1978)		64.86
307												
308						Gamma GOF Test						
309					A-D Test Statistic	0.52				Anderson-Darling Gamma GOF Test		
310					5% A-D Critical Value	0.734				Detected data appear Gamma Distributed at 5% Significance Level		
311					K-S Test Statistic	0.187				Kolmogrov-Smirnoff Gamma GOF Test		
312					5% K-S Critical Value	0.269				Detected data appear Gamma Distributed at 5% Significance Level		
313						Detected data appear Gamma Distributed at 5% Significance Level						
314												
315						Gamma Statistics						
316					k hat (MLE)	2.344				k star (bias corrected MLE)		1.708
317					Theta hat (MLE)	20.1				Theta star (bias corrected MLE)		27.59
318					nu hat (MLE)	46.89				nu star (bias corrected)		34.15
319					MLE Mean (bias corrected)	47.11				MLE Sd (bias corrected)		36.05
320										Approximate Chi Square Value (0.05)		21.79
321					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		20.09
322												
323						Assuming Gamma Distribution						
324					95% Approximate Gamma UCL (use when n>=50))	73.85				95% Adjusted Gamma UCL (use when n<50)		80.11
325												
326						Lognormal GOF Test						
327					Shapiro Wilk Test Statistic	0.881				Shapiro Wilk Lognormal GOF Test		
328					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
329					Lilliefors Test Statistic	0.178				Lilliefors Lognormal GOF Test		
330					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
331						Data appear Lognormal at 5% Significance Level						
332												
333						Lognormal Statistics						
334					Minimum of Logged Data	2.542				Mean of logged Data		3.624
335					Maximum of Logged Data	4.443				SD of logged Data		0.751
336												

	A	B	C	D	E	F	G	H	I	J	K	L
337	**Assuming Lognormal Distribution**											
338					95% H-UCL	95.83				90% Chebyshev (MVUE) UCL		83.49
339				95% Chebyshev (MVUE) UCL		99.54				97.5% Chebyshev (MVUE) UCL		121.8
340				99% Chebyshev (MVUE) UCL		165.6						
341												
342	**Nonparametric Distribution Free UCL Statistics**											
343	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
344												
345	**Nonparametric Distribution Free UCLs**											
346					95% CLT UCL	62.89				95% Jackknife UCL		64.7
347				95% Standard Bootstrap UCL		61.98				95% Bootstrap-t UCL		67.32
348				95% Hall's Bootstrap UCL		60.4				95% Percentile Bootstrap UCL		62.79
349				95% BCA Bootstrap UCL		62.65						
350				90% Chebyshev(Mean, Sd) UCL		75.9				95% Chebyshev(Mean, Sd) UCL		88.94
351				97.5% Chebyshev(Mean, Sd) UCL		107				99% Chebyshev(Mean, Sd) UCL		142.6
352												
353	**Suggested UCL to Use**											
354				95% Student's-t UCL		64.7						
355												
356	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
357	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
358	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
359	For additional insight the user may want to consult a statistician.											
360												
361												

	A	B	C	D	E	F	G	H	I	J	K	L
362	Cobalt											
363												
364					General Statistics							
365					Total Number of Observations	10				Number of Distinct Observations		6
366										Number of Missing Observations		0
367					Minimum	4.6				Mean		7.482
368					Maximum	13				Median		7.482
369					SD	2.283				Std. Error of Mean		0.722
370					Coefficient of Variation	0.305				Skewness		1.457
371												
372					Normal GOF Test							
373					Shapiro Wilk Test Statistic	0.789				Shapiro Wilk GOF Test		
374					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
375					Lilliefors Test Statistic	0.3				Lilliefors GOF Test		
376					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
377					Data Not Normal at 5% Significance Level							
378												
379					Assuming Normal Distribution							
380					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
381					95% Student's-t UCL	8.805				95% Adjusted-CLT UCL (Chen-1995)		9.025
382										95% Modified-t UCL (Johnson-1978)		8.861
383												
384					Gamma GOF Test							
385					A-D Test Statistic	0.909				Anderson-Darling Gamma GOF Test		
386					5% A-D Critical Value	0.725				Data Not Gamma Distributed at 5% Significance Level		
387					K-S Test Statistic	0.264				Kolmogrov-Smirnoff Gamma GOF Test		
388					5% K-S Critical Value	0.266				Detected data appear Gamma Distributed at 5% Significance Level		
389					Detected data follow Appr. Gamma Distribution at 5% Significance Level							
390												
391					Gamma Statistics							
392					k hat (MLE)	13.31				k star (bias corrected MLE)		9.384
393					Theta hat (MLE)	0.562				Theta star (bias corrected MLE)		0.797
394					nu hat (MLE)	266.2				nu star (bias corrected)		187.7
395					MLE Mean (bias corrected)	7.482				MLE Sd (bias corrected)		2.442
396										Approximate Chi Square Value (0.05)		157
397					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		152.1
398												
399					Assuming Gamma Distribution							
400					95% Approximate Gamma UCL (use when n>=50)	8.945				95% Adjusted Gamma UCL (use when n<50)		9.232
401												
402					Lognormal GOF Test							
403					Shapiro Wilk Test Statistic	0.847				Shapiro Wilk Lognormal GOF Test		
404					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
405					Lilliefors Test Statistic	0.253				Lilliefors Lognormal GOF Test		
406					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
407					Data appear Lognormal at 5% Significance Level							
408												
409					Lognormal Statistics							
410					Minimum of Logged Data	1.526				Mean of logged Data		1.974
411					Maximum of Logged Data	2.565				SD of logged Data		0.287
412												

	A	B	C	D	E	F	G	H	I	J	K	L
413	Assuming Lognormal Distribution											
414					95% H-UCL	9.057				90% Chebyshev (MVUE) UCL		9.522
415				95% Chebyshev (MVUE) UCL		10.45				97.5% Chebyshev (MVUE) UCL		11.74
416				99% Chebyshev (MVUE) UCL		14.27						
417												
418	Nonparametric Distribution Free UCL Statistics											
419	Data appear to follow a Discernible Distribution at 5% Significance Level											
420												
421	Nonparametric Distribution Free UCLs											
422					95% CLT UCL	8.67				95% Jackknife UCL		8.805
423				95% Standard Bootstrap UCL		8.599				95% Bootstrap-t UCL		9.195
424				95% Hall's Bootstrap UCL		15.3				95% Percentile Bootstrap UCL		8.787
425				95% BCA Bootstrap UCL		8.993						
426				90% Chebyshev(Mean, Sd) UCL		9.648				95% Chebyshev(Mean, Sd) UCL		10.63
427				97.5% Chebyshev(Mean, Sd) UCL		11.99				99% Chebyshev(Mean, Sd) UCL		14.67
428												
429	Suggested UCL to Use											
430				95% Adjusted Gamma UCL		9.232						
431												
432	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
433	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
434	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
435	For additional insight the user may want to consult a statistician.											
436												
437												

	A	B	C	D	E	F	G	H	I	J	K	L
438	Iron											
439												
440					General Statistics							
441					Total Number of Observations	10				Number of Distinct Observations		10
442										Number of Missing Observations		0
443					Minimum	11874				Mean		29002
444					Maximum	44804				Median		25712
445					SD	9471				Std. Error of Mean		2995
446					Coefficient of Variation	0.327				Skewness		-0.0108
447												
448					Normal GOF Test							
449					Shapiro Wilk Test Statistic	0.947				Shapiro Wilk GOF Test		
450					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
451					Lilliefors Test Statistic	0.229				Lilliefors GOF Test		
452					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
453					Data appear Normal at 5% Significance Level							
454												
455					Assuming Normal Distribution							
456					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
457					95% Student's-t UCL	34492				95% Adjusted-CLT UCL (Chen-1995)		33917
458										95% Modified-t UCL (Johnson-1978)		34490
459												
460					Gamma GOF Test							
461					A-D Test Statistic	0.44				Anderson-Darling Gamma GOF Test		
462					5% A-D Critical Value	0.726				Detected data appear Gamma Distributed at 5% Significance Level		
463					K-S Test Statistic	0.189				Kolmogrov-Smirnoff Gamma GOF Test		
464					5% K-S Critical Value	0.267				Detected data appear Gamma Distributed at 5% Significance Level		
465					Detected data appear Gamma Distributed at 5% Significance Level							
466												
467					Gamma Statistics							
468					k hat (MLE)	9.091				k star (bias corrected MLE)		6.43
469					Theta hat (MLE)	3190				Theta star (bias corrected MLE)		4510
470					nu hat (MLE)	181.8				nu star (bias corrected)		128.6
471					MLE Mean (bias corrected)	29002				MLE Sd (bias corrected)		11437
472										Approximate Chi Square Value (0.05)		103.4
473					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		99.49
474												
475					Assuming Gamma Distribution							
476					95% Approximate Gamma UCL (use when n>=50))	36068				95% Adjusted Gamma UCL (use when n<50)		37490
477												
478					Lognormal GOF Test							
479					Shapiro Wilk Test Statistic	0.892				Shapiro Wilk Lognormal GOF Test		
480					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
481					Lilliefors Test Statistic	0.215				Lilliefors Lognormal GOF Test		
482					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
483					Data appear Lognormal at 5% Significance Level							
484												
485					Lognormal Statistics							
486					Minimum of Logged Data	9.382				Mean of logged Data		10.22
487					Maximum of Logged Data	10.71				SD of logged Data		0.372
488												

	A	B	C	D	E	F	G	H	I	J	K	L
489	**Assuming Lognormal Distribution**											
490					95% H-UCL	37911				90% Chebyshev (MVUE) UCL		39569
491					95% Chebyshev (MVUE) UCL	44279				97.5% Chebyshev (MVUE) UCL		50816
492					99% Chebyshev (MVUE) UCL	63657						
493												
494	**Nonparametric Distribution Free UCL Statistics**											
495	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
496												
497	**Nonparametric Distribution Free UCLs**											
498					95% CLT UCL	33928				95% Jackknife UCL		34492
499					95% Standard Bootstrap UCL	33599				95% Bootstrap-t UCL		34489
500					95% Hall's Bootstrap UCL	34529				95% Percentile Bootstrap UCL		33683
501					95% BCA Bootstrap UCL	33498						
502					90% Chebyshev(Mean, Sd) UCL	37986				95% Chebyshev(Mean, Sd) UCL		42056
503					97.5% Chebyshev(Mean, Sd) UCL	47705				99% Chebyshev(Mean, Sd) UCL		58800
504												
505	**Suggested UCL to Use**											
506					95% Student's-t UCL	34492						
507												
508	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
509	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
510	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
511	For additional insight the user may want to consult a statistician.											
512												
513	**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**											
514	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
515												
516												

	A	B	C	D	E	F	G	H	I	J	K	L
517	Manganese											
518												
519					General Statistics							
520					Total Number of Observations	10				Number of Distinct Observations		10
521										Number of Missing Observations		0
522					Minimum	108				Mean		436.8
523					Maximum	935				Median		372.5
524					SD	236.9				Std. Error of Mean		74.92
525					Coefficient of Variation	0.542				Skewness		0.839
526												
527					Normal GOF Test							
528					Shapiro Wilk Test Statistic	0.945				Shapiro Wilk GOF Test		
529					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
530					Lilliefors Test Statistic	0.186				Lilliefors GOF Test		
531					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
532					Data appear Normal at 5% Significance Level							
533												
534					Assuming Normal Distribution							
535					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
536					95% Student's-t UCL	574.1				95% Adjusted-CLT UCL (Chen-1995)		581.2
537										95% Modified-t UCL (Johnson-1978)		577.4
538												
539					Gamma GOF Test							
540					A-D Test Statistic	0.219				Anderson-Darling Gamma GOF Test		
541					5% A-D Critical Value	0.731				Detected data appear Gamma Distributed at 5% Significance Level		
542					K-S Test Statistic	0.15				Kolmogrov-Smirnoff Gamma GOF Test		
543					5% K-S Critical Value	0.268				Detected data appear Gamma Distributed at 5% Significance Level		
544					Detected data appear Gamma Distributed at 5% Significance Level							
545												
546					Gamma Statistics							
547					k hat (MLE)	3.496				k star (bias corrected MLE)		2.514
548					Theta hat (MLE)	124.9				Theta star (bias corrected MLE)		173.7
549					nu hat (MLE)	69.92				nu star (bias corrected)		50.28
550					MLE Mean (bias corrected)	436.8				MLE Sd (bias corrected)		275.5
551										Approximate Chi Square Value (0.05)		35
552					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		32.79
553												
554					Assuming Gamma Distribution							
555					95% Approximate Gamma UCL (use when n>=50))	627.5				95% Adjusted Gamma UCL (use when n<50)		669.7
556												
557					Lognormal GOF Test							
558					Shapiro Wilk Test Statistic	0.953				Shapiro Wilk Lognormal GOF Test		
559					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
560					Lilliefors Test Statistic	0.19				Lilliefors Lognormal GOF Test		
561					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
562					Data appear Lognormal at 5% Significance Level							
563												
564					Lognormal Statistics							
565					Minimum of Logged Data	4.682				Mean of logged Data		5.93
566					Maximum of Logged Data	6.841				SD of logged Data		0.614
567												

	A	B	C	D	E	F	G	H	I	J	K	L
568	**Assuming Lognormal Distribution**											
569					95% H-UCL	739.9				90% Chebyshev (MVUE) UCL		709.4
570				95% Chebyshev (MVUE) UCL		829.5				97.5% Chebyshev (MVUE) UCL		996.2
571				99% Chebyshev (MVUE) UCL		1324						
572												
573	**Nonparametric Distribution Free UCL Statistics**											
574	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
575												
576	**Nonparametric Distribution Free UCLs**											
577					95% CLT UCL	560				95% Jackknife UCL		574.1
578				95% Standard Bootstrap UCL		554.9				95% Bootstrap-t UCL		610.3
579				95% Hall's Bootstrap UCL		644.8				95% Percentile Bootstrap UCL		550.9
580				95% BCA Bootstrap UCL		570.2						
581				90% Chebyshev(Mean, Sd) UCL		661.5				95% Chebyshev(Mean, Sd) UCL		763.3
582				97.5% Chebyshev(Mean, Sd) UCL		904.6				99% Chebyshev(Mean, Sd) UCL		1182
583												
584	**Suggested UCL to Use**											
585				95% Student's-t UCL		574.1						
586												
587	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
588	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
589	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
590	For additional insight the user may want to consult a statistician.											
591												
592												

	A	B	C	D	E	F	G	H	I	J	K	L
593	Mercury											
594												
595					General Statistics							
596					Total Number of Observations	10				Number of Distinct Observations		8
597										Number of Missing Observations		0
598					Minimum	0.0096				Mean		3.871
599					Maximum	10				Median		0.63
600					SD	4.764				Std. Error of Mean		1.507
601					Coefficient of Variation	1.231				Skewness		0.56
602												
603					Normal GOF Test							
604					Shapiro Wilk Test Statistic	0.711				Shapiro Wilk GOF Test		
605					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
606					Lilliefors Test Statistic	0.334				Lilliefors GOF Test		
607					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
608					Data Not Normal at 5% Significance Level							
609												
610					Assuming Normal Distribution							
611					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
612					95% Student's-t UCL	6.632				95% Adjusted-CLT UCL (Chen-1995)		6.634
613										95% Modified-t UCL (Johnson-1978)		6.677
614												
615					Gamma GOF Test							
616					A-D Test Statistic	0.729				Anderson-Darling Gamma GOF Test		
617					5% A-D Critical Value	0.806				Detected data appear Gamma Distributed at 5% Significance Level		
618					K-S Test Statistic	0.232				Kolmogrov-Smirnoff Gamma GOF Test		
619					5% K-S Critical Value	0.286				Detected data appear Gamma Distributed at 5% Significance Level		
620					Detected data appear Gamma Distributed at 5% Significance Level							
621												
622					Gamma Statistics							
623					k hat (MLE)	0.34				k star (bias corrected MLE)		0.305
624					Theta hat (MLE)	11.38				Theta star (bias corrected MLE)		12.7
625					nu hat (MLE)	6.804				nu star (bias corrected)		6.096
626					MLE Mean (bias corrected)	3.871				MLE Sd (bias corrected)		7.011
627										Approximate Chi Square Value (0.05)		1.689
628					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		1.319
629												
630					Assuming Gamma Distribution							
631					95% Approximate Gamma UCL (use when n>=50)	13.97				95% Adjusted Gamma UCL (use when n<50)		17.89
632												
633					Lognormal GOF Test							
634					Shapiro Wilk Test Statistic	0.869				Shapiro Wilk Lognormal GOF Test		
635					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
636					Lilliefors Test Statistic	0.228				Lilliefors Lognormal GOF Test		
637					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
638					Data appear Lognormal at 5% Significance Level							
639												
640					Lognormal Statistics							
641					Minimum of Logged Data	-4.646				Mean of logged Data		-0.632
642					Maximum of Logged Data	2.303				SD of logged Data		2.772
643												

	A	B	C	D	E	F	G	H	I	J	K	L
644					Assuming Lognormal Distribution							
645					95% H-UCL	20908				90% Chebyshev (MVUE) UCL		29.84
646				95% Chebyshev (MVUE) UCL		39.44				97.5% Chebyshev (MVUE) UCL		52.77
647				99% Chebyshev (MVUE) UCL		78.96						
648												
649					Nonparametric Distribution Free UCL Statistics							
650					Data appear to follow a Discernible Distribution at 5% Significance Level							
651												
652					Nonparametric Distribution Free UCLs							
653					95% CLT UCL	6.349				95% Jackknife UCL		6.632
654				95% Standard Bootstrap UCL		6.254				95% Bootstrap-t UCL		7.781
655				95% Hall's Bootstrap UCL		5.656				95% Percentile Bootstrap UCL		6.497
656				95% BCA Bootstrap UCL		6.472						
657				90% Chebyshev(Mean, Sd) UCL		8.39				95% Chebyshev(Mean, Sd) UCL		10.44
658				97.5% Chebyshev(Mean, Sd) UCL		13.28				99% Chebyshev(Mean, Sd) UCL		18.86
659												
660					Suggested UCL to Use							
661				95% Adjusted Gamma UCL		17.89						
662												
663					Recommended UCL exceeds the maximum observation							
664												
665					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
666					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
667					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
668					For additional insight the user may want to consult a statistician.							
669												
670												

	A	B	C	D	E	F	G	H	I	J	K	L
671	Molybdenum											
672												
673						General Statistics						
674					Total Number of Observations	10				Number of Distinct Observations		5
675										Number of Missing Observations		0
676					Minimum	0.87				Mean		19.47
677					Maximum	57				Median		15
678					SD	17.76				Std. Error of Mean		5.616
679					Coefficient of Variation	0.912				Skewness		1.414
680												
681						Normal GOF Test						
682					Shapiro Wilk Test Statistic	0.76				Shapiro Wilk GOF Test		
683					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
684					Lilliefors Test Statistic	0.399				Lilliefors GOF Test		
685					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
686						Data Not Normal at 5% Significance Level						
687												
688						Assuming Normal Distribution						
689					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
690					95% Student's-t UCL	29.76				95% Adjusted-CLT UCL (Chen-1995)		31.39
691										95% Modified-t UCL (Johnson-1978)		30.18
692												
693						Gamma GOF Test						
694					A-D Test Statistic	0.929				Anderson-Darling Gamma GOF Test		
695					5% A-D Critical Value	0.746				Data Not Gamma Distributed at 5% Significance Level		
696					K-S Test Statistic	0.325				Kolmogrov-Smirnoff Gamma GOF Test		
697					5% K-S Critical Value	0.273				Data Not Gamma Distributed at 5% Significance Level		
698						Data Not Gamma Distributed at 5% Significance Level						
699												
700						Gamma Statistics						
701					k hat (MLE)	1.11				k star (bias corrected MLE)		0.843
702					Theta hat (MLE)	17.54				Theta star (bias corrected MLE)		23.08
703					nu hat (MLE)	22.19				nu star (bias corrected)		16.87
704					MLE Mean (bias corrected)	19.47				MLE Sd (bias corrected)		21.2
705										Approximate Chi Square Value (0.05)		8.578
706					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		7.572
707												
708						Assuming Gamma Distribution						
709					95% Approximate Gamma UCL (use when n>=50))	38.28				95% Adjusted Gamma UCL (use when n<50)		43.37
710												
711						Lognormal GOF Test						
712					Shapiro Wilk Test Statistic	0.801				Shapiro Wilk Lognormal GOF Test		
713					5% Shapiro Wilk Critical Value	0.842				Data Not Lognormal at 5% Significance Level		
714					Lilliefors Test Statistic	0.378				Lilliefors Lognormal GOF Test		
715					5% Lilliefors Critical Value	0.28				Data Not Lognormal at 5% Significance Level		
716						Data Not Lognormal at 5% Significance Level						
717												
718						Lognormal Statistics						
719					Minimum of Logged Data	-0.139				Mean of logged Data		2.455
720					Maximum of Logged Data	4.043				SD of logged Data		1.289
721												

	A	B	C	D	E	F	G	H	I	J	K	L
722	Assuming Lognormal Distribution											
723					95% H-UCL	132.4				90% Chebyshev (MVUE) UCL		53.92
724				95% Chebyshev (MVUE) UCL		67.69				97.5% Chebyshev (MVUE) UCL		86.81
725				99% Chebyshev (MVUE) UCL		124.4						
726												
727	Nonparametric Distribution Free UCL Statistics											
728	Data do not follow a Discernible Distribution (0.05)											
729												
730	Nonparametric Distribution Free UCLs											
731					95% CLT UCL	28.7				95% Jackknife UCL		29.76
732				95% Standard Bootstrap UCL		28.27				95% Bootstrap-t UCL		42.63
733				95% Hall's Bootstrap UCL		107.3				95% Percentile Bootstrap UCL		29.07
734				95% BCA Bootstrap UCL		29.88						
735				90% Chebyshev(Mean, Sd) UCL		36.31				95% Chebyshev(Mean, Sd) UCL		43.95
736				97.5% Chebyshev(Mean, Sd) UCL		54.54				99% Chebyshev(Mean, Sd) UCL		75.34
737												
738	Suggested UCL to Use											
739				95% Chebyshev (Mean, Sd) UCL		43.95						
740												
741	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
742	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
743	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
744	For additional insight the user may want to consult a statistician.											
745												
746												

	A	B	C	D	E	F	G	H	I	J	K	L
747	Neptunium-237											
748												
749					General Statistics							
750					Total Number of Observations	10			Number of Distinct Observations			4
751									Number of Missing Observations			0
752					Minimum	0.1			Mean			0.275
753					Maximum	0.524			Median			0.275
754					SD	0.104			Std. Error of Mean			0.033
755					Coefficient of Variation	0.38			Skewness			1.188
756												
757					Normal GOF Test							
758					Shapiro Wilk Test Statistic	0.731			Shapiro Wilk GOF Test			
759					5% Shapiro Wilk Critical Value	0.842			Data Not Normal at 5% Significance Level			
760					Lilliefors Test Statistic	0.4			Lilliefors GOF Test			
761					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level			
762					Data Not Normal at 5% Significance Level							
763												
764					Assuming Normal Distribution							
765					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
766					95% Student's-t UCL	0.335			95% Adjusted-CLT UCL (Chen-1995)			0.342
767									95% Modified-t UCL (Johnson-1978)			0.337
768												
769					Gamma GOF Test							
770					A-D Test Statistic	1.428			Anderson-Darling Gamma GOF Test			
771					5% A-D Critical Value	0.727			Data Not Gamma Distributed at 5% Significance Level			
772					K-S Test Statistic	0.351			Kolmogrov-Smirnoff Gamma GOF Test			
773					5% K-S Critical Value	0.267			Data Not Gamma Distributed at 5% Significance Level			
774					Data Not Gamma Distributed at 5% Significance Level							
775												
776					Gamma Statistics							
777					k hat (MLE)	7.497			k star (bias corrected MLE)			5.315
778					Theta hat (MLE)	0.0366			Theta star (bias corrected MLE)			0.0517
779					nu hat (MLE)	149.9			nu star (bias corrected)			106.3
780					MLE Mean (bias corrected)	0.275			MLE Sd (bias corrected)			0.119
781									Approximate Chi Square Value (0.05)			83.5
782					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value			80
783												
784					Assuming Gamma Distribution							
785					95% Approximate Gamma UCL (use when n>=50))	0.35			95% Adjusted Gamma UCL (use when n<50)			0.365
786												
787					Lognormal GOF Test							
788					Shapiro Wilk Test Statistic	0.746			Shapiro Wilk Lognormal GOF Test			
789					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level			
790					Lilliefors Test Statistic	0.366			Lilliefors Lognormal GOF Test			
791					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
792					Data Not Lognormal at 5% Significance Level							
793												
794					Lognormal Statistics							
795					Minimum of Logged Data	-2.303			Mean of logged Data			-1.36
796					Maximum of Logged Data	-0.646			SD of logged Data			0.407
797												

	A	B	C	D	E	F	G	H	I	J	K	L
798					Assuming Lognormal Distribution							
799					95% H-UCL	0.371				90% Chebyshev (MVUE) UCL		0.384
800				95% Chebyshev (MVUE) UCL		0.433				97.5% Chebyshev (MVUE) UCL		0.501
801				99% Chebyshev (MVUE) UCL		0.635						
802												
803					Nonparametric Distribution Free UCL Statistics							
804					Data do not follow a Discernible Distribution (0.05)							
805												
806					Nonparametric Distribution Free UCLs							
807					95% CLT UCL	0.329				95% Jackknife UCL		0.335
808				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
809				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
810				95% BCA Bootstrap UCL		N/A						
811				90% Chebyshev(Mean, Sd) UCL		0.374				95% Chebyshev(Mean, Sd) UCL		0.419
812				97.5% Chebyshev(Mean, Sd) UCL		0.481				99% Chebyshev(Mean, Sd) UCL		0.603
813												
814					Suggested UCL to Use							
815					95% Student's-t UCL	0.335				or 95% Modified-t UCL		0.337
816												
817	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
818	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
819	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
820	For additional insight the user may want to consult a statistician.											
821												
822												

	A	B	C	D	E	F	G	H	I	J	K	L
823	PAH, Total											
824												
825					General Statistics							
826					Total Number of Observations	10			Number of Distinct Observations			7
827									Number of Missing Observations			0
828					Minimum	0.0078			Mean			0.26
829					Maximum	0.48			Median			0.26
830					SD	0.15			Std. Error of Mean			0.0474
831					Coefficient of Variation	0.576			Skewness			-0.607
832												
833					Normal GOF Test							
834					Shapiro Wilk Test Statistic	0.886			Shapiro Wilk GOF Test			
835					5% Shapiro Wilk Critical Value	0.842			Data appear Normal at 5% Significance Level			
836					Lilliefors Test Statistic	0.3			Lilliefors GOF Test			
837					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level			
838					Data appear Approximate Normal at 5% Significance Level							
839												
840					Assuming Normal Distribution							
841					95% Normal UCL				95% UCLs (Adjusted for Skewness)			
842					95% Student's-t UCL	0.347			95% Adjusted-CLT UCL (Chen-1995)			0.328
843									95% Modified-t UCL (Johnson-1978)			0.345
844												
845					Gamma GOF Test							
846					A-D Test Statistic	1.389			Anderson-Darling Gamma GOF Test			
847					5% A-D Critical Value	0.744			Data Not Gamma Distributed at 5% Significance Level			
848					K-S Test Statistic	0.419			Kolmogrov-Smirnoff Gamma GOF Test			
849					5% K-S Critical Value	0.273			Data Not Gamma Distributed at 5% Significance Level			
850					Data Not Gamma Distributed at 5% Significance Level							
851												
852					Gamma Statistics							
853					k hat (MLE)	1.235			k star (bias corrected MLE)			0.931
854					Theta hat (MLE)	0.21			Theta star (bias corrected MLE)			0.279
855					nu hat (MLE)	24.7			nu star (bias corrected)			18.63
856					MLE Mean (bias corrected)	0.26			MLE Sd (bias corrected)			0.269
857									Approximate Chi Square Value (0.05)			9.845
858					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value			8.756
859												
860					Assuming Gamma Distribution							
861					95% Approximate Gamma UCL (use when n>=50))	0.491			95% Adjusted Gamma UCL (use when n<50)			0.553
862												
863					Lognormal GOF Test							
864					Shapiro Wilk Test Statistic	0.678			Shapiro Wilk Lognormal GOF Test			
865					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level			
866					Lilliefors Test Statistic	0.429			Lilliefors Lognormal GOF Test			
867					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
868					Data Not Lognormal at 5% Significance Level							
869												
870					Lognormal Statistics							
871					Minimum of Logged Data	-4.854			Mean of logged Data			-1.804
872					Maximum of Logged Data	-0.734			SD of logged Data			1.387
873												

	A	B	C	D	E	F	G	H	I	J	K	L
874					Assuming Lognormal Distribution							
875					95% H-UCL	2.673				90% Chebyshev (MVUE) UCL		0.883
876				95% Chebyshev (MVUE) UCL		1.116				97.5% Chebyshev (MVUE) UCL		1.439
877				99% Chebyshev (MVUE) UCL		2.073						
878												
879					Nonparametric Distribution Free UCL Statistics							
880					Data appear to follow a Discernible Distribution at 5% Significance Level							
881												
882					Nonparametric Distribution Free UCLs							
883					95% CLT UCL	0.338				95% Jackknife UCL		0.347
884				95% Standard Bootstrap UCL		0.334				95% Bootstrap-t UCL		0.337
885				95% Hall's Bootstrap UCL		0.333				95% Percentile Bootstrap UCL		0.332
886				95% BCA Bootstrap UCL		0.326						
887				90% Chebyshev(Mean, Sd) UCL		0.402				95% Chebyshev(Mean, Sd) UCL		0.466
888				97.5% Chebyshev(Mean, Sd) UCL		0.555				99% Chebyshev(Mean, Sd) UCL		0.731
889												
890					Suggested UCL to Use							
891					95% Student's-t UCL	0.347						
892												
893	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
894	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
895	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
896	For additional insight the user may want to consult a statistician.											
897												
898	Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be											
899	reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.											
900												
901												

	A	B	C	D	E	F	G	H	I	J	K	L
902	PCB, Total											
903												
904						General Statistics						
905					Total Number of Observations	10				Number of Distinct Observations		8
906										Number of Missing Observations		0
907					Minimum	0.018				Mean		0.708
908					Maximum	5				Median		0.24
909					SD	1.525				Std. Error of Mean		0.482
910					Coefficient of Variation	2.154				Skewness		3.04
911												
912						Normal GOF Test						
913					Shapiro Wilk Test Statistic	0.483				Shapiro Wilk GOF Test		
914					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
915					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
916					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
917						Data Not Normal at 5% Significance Level						
918												
919						Assuming Normal Distribution						
920					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
921					95% Student's-t UCL	1.592				95% Adjusted-CLT UCL (Chen-1995)		1.996
922										95% Modified-t UCL (Johnson-1978)		1.669
923												
924						Gamma GOF Test						
925					A-D Test Statistic	0.845				Anderson-Darling Gamma GOF Test		
926					5% A-D Critical Value	0.779				Data Not Gamma Distributed at 5% Significance Level		
927					K-S Test Statistic	0.297				Kolmogrov-Smirnoff Gamma GOF Test		
928					5% K-S Critical Value	0.281				Data Not Gamma Distributed at 5% Significance Level		
929						Data Not Gamma Distributed at 5% Significance Level						
930												
931						Gamma Statistics						
932					k hat (MLE)	0.488				k star (bias corrected MLE)		0.408
933					Theta hat (MLE)	1.451				Theta star (bias corrected MLE)		1.735
934					nu hat (MLE)	9.754				nu star (bias corrected)		8.161
935					MLE Mean (bias corrected)	0.708				MLE Sd (bias corrected)		1.108
936										Approximate Chi Square Value (0.05)		2.829
937					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		2.312
938												
939						Assuming Gamma Distribution						
940					95% Approximate Gamma UCL (use when n>=50))	2.042				95% Adjusted Gamma UCL (use when n<50)		2.498
941												
942						Lognormal GOF Test						
943					Shapiro Wilk Test Statistic	0.937				Shapiro Wilk Lognormal GOF Test		
944					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
945					Lilliefors Test Statistic	0.178				Lilliefors Lognormal GOF Test		
946					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
947						Data appear Lognormal at 5% Significance Level						
948												
949						Lognormal Statistics						
950					Minimum of Logged Data	-4.017				Mean of logged Data		-1.653
951					Maximum of Logged Data	1.609				SD of logged Data		1.648
952												

	A	B	C	D	E	F	G	H	I	J	K	L
953	Assuming Lognormal Distribution											
954					95% H-UCL	9.07				90% Chebyshev (MVUE) UCL		1.539
955				95% Chebyshev (MVUE) UCL		1.973				97.5% Chebyshev (MVUE) UCL		2.574
956				99% Chebyshev (MVUE) UCL		3.756						
957												
958	Nonparametric Distribution Free UCL Statistics											
959	Data appear to follow a Discernible Distribution at 5% Significance Level											
960												
961	Nonparametric Distribution Free UCLs											
962					95% CLT UCL	1.501				95% Jackknife UCL		1.592
963				95% Standard Bootstrap UCL		1.481				95% Bootstrap-t UCL		8.516
964				95% Hall's Bootstrap UCL		6.084				95% Percentile Bootstrap UCL		1.618
965				95% BCA Bootstrap UCL		2.15						
966				90% Chebyshev(Mean, Sd) UCL		2.154				95% Chebyshev(Mean, Sd) UCL		2.81
967				97.5% Chebyshev(Mean, Sd) UCL		3.719				99% Chebyshev(Mean, Sd) UCL		5.506
968												
969	Suggested UCL to Use											
970				99% Chebyshev (Mean, Sd) UCL		5.506						
971												
972	Recommended UCL exceeds the maximum observation											
973												
974	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
975	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
976	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
977	For additional insight the user may want to consult a statistician.											
978												
979												

	A	B	C	D	E	F	G	H	I	J	K	L
980	Pentachlorophenol											
981												
982						General Statistics						
983					Total Number of Observations	10				Number of Distinct Observations		7
984										Number of Missing Observations		0
985					Minimum	0.709				Mean		1.332
986					Maximum	2.1				Median		1.332
987					SD	0.474				Std. Error of Mean		0.15
988					Coefficient of Variation	0.356				Skewness		0.163
989												
990						Normal GOF Test						
991					Shapiro Wilk Test Statistic	0.916				Shapiro Wilk GOF Test		
992					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
993					Lilliefors Test Statistic	0.2				Lilliefors GOF Test		
994					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
995						Data appear Normal at 5% Significance Level						
996												
997						Assuming Normal Distribution						
998					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
999					95% Student's-t UCL	1.607				95% Adjusted-CLT UCL (Chen-1995)		1.587
1000										95% Modified-t UCL (Johnson-1978)		1.608
1001												
1002						Gamma GOF Test						
1003					A-D Test Statistic	0.507				Anderson-Darling Gamma GOF Test		
1004					5% A-D Critical Value	0.727				Detected data appear Gamma Distributed at 5% Significance Level		
1005					K-S Test Statistic	0.246				Kolmogrov-Smirnoff Gamma GOF Test		
1006					5% K-S Critical Value	0.267				Detected data appear Gamma Distributed at 5% Significance Level		
1007						Detected data appear Gamma Distributed at 5% Significance Level						
1008												
1009						Gamma Statistics						
1010					k hat (MLE)	8.243				k star (bias corrected MLE)		5.837
1011					Theta hat (MLE)	0.162				Theta star (bias corrected MLE)		0.228
1012					nu hat (MLE)	164.9				nu star (bias corrected)		116.7
1013					MLE Mean (bias corrected)	1.332				MLE Sd (bias corrected)		0.551
1014										Approximate Chi Square Value (0.05)		92.79
1015					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		89.09
1016												
1017						Assuming Gamma Distribution						
1018					95% Approximate Gamma UCL (use when n>=50))	1.676				95% Adjusted Gamma UCL (use when n<50)		1.745
1019												
1020						Lognormal GOF Test						
1021					Shapiro Wilk Test Statistic	0.898				Shapiro Wilk Lognormal GOF Test		
1022					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1023					Lilliefors Test Statistic	0.265				Lilliefors Lognormal GOF Test		
1024					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1025						Data appear Lognormal at 5% Significance Level						
1026												
1027						Lognormal Statistics						
1028					Minimum of Logged Data	-0.344				Mean of logged Data		0.225
1029					Maximum of Logged Data	0.742				SD of logged Data		0.38
1030												

	A	B	C	D	E	F	G	H	I	J	K	L
1031					Assuming Lognormal Distribution							
1032					95% H-UCL	1.748				90% Chebyshev (MVUE) UCL		1.822
1033				95% Chebyshev (MVUE) UCL		2.043				97.5% Chebyshev (MVUE) UCL		2.349
1034				99% Chebyshev (MVUE) UCL		2.95						
1035												
1036					Nonparametric Distribution Free UCL Statistics							
1037					Data appear to follow a Discernible Distribution at 5% Significance Level							
1038												
1039					Nonparametric Distribution Free UCLs							
1040					95% CLT UCL	1.579				95% Jackknife UCL		1.607
1041				95% Standard Bootstrap UCL		1.57				95% Bootstrap-t UCL		1.66
1042				95% Hall's Bootstrap UCL		1.61				95% Percentile Bootstrap UCL		1.565
1043				95% BCA Bootstrap UCL		1.582						
1044				90% Chebyshev(Mean, Sd) UCL		1.782				95% Chebyshev(Mean, Sd) UCL		1.985
1045				97.5% Chebyshev(Mean, Sd) UCL		2.268				99% Chebyshev(Mean, Sd) UCL		2.823
1046												
1047					Suggested UCL to Use							
1048					95% Student's-t UCL	1.607						
1049												
1050	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1051	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1052	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1053	For additional insight the user may want to consult a statistician.											
1054												
1055												

	A	B	C	D	E	F	G	H	I	J	K	L
1056	Thallium											
1057												
1058					General Statistics							
1059					Total Number of Observations	10				Number of Distinct Observations		6
1060										Number of Missing Observations		0
1061					Minimum	0.12				Mean		1.15
1062					Maximum	5				Median		0.875
1063					SD	1.413				Std. Error of Mean		0.447
1064					Coefficient of Variation	1.229				Skewness		2.675
1065												
1066					Normal GOF Test							
1067					Shapiro Wilk Test Statistic	0.629				Shapiro Wilk GOF Test		
1068					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
1069					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
1070					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
1071					Data Not Normal at 5% Significance Level							
1072												
1073					Assuming Normal Distribution							
1074					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1075					95% Student's-t UCL	1.969				95% Adjusted-CLT UCL (Chen-1995)		2.289
1076										95% Modified-t UCL (Johnson-1978)		2.032
1077												
1078					Gamma GOF Test							
1079					A-D Test Statistic	0.556				Anderson-Darling Gamma GOF Test		
1080					5% A-D Critical Value	0.745				Detected data appear Gamma Distributed at 5% Significance Level		
1081					K-S Test Statistic	0.277				Kolmogrov-Smirnoff Gamma GOF Test		
1082					5% K-S Critical Value	0.273				Data Not Gamma Distributed at 5% Significance Level		
1083					Detected data follow Appr. Gamma Distribution at 5% Significance Level							
1084												
1085					Gamma Statistics							
1086					k hat (MLE)	1.164				k star (bias corrected MLE)		0.881
1087					Theta hat (MLE)	0.988				Theta star (bias corrected MLE)		1.305
1088					nu hat (MLE)	23.27				nu star (bias corrected)		17.62
1089					MLE Mean (bias corrected)	1.15				MLE Sd (bias corrected)		1.225
1090										Approximate Chi Square Value (0.05)		9.119
1091					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		8.078
1092												
1093					Assuming Gamma Distribution							
1094					95% Approximate Gamma UCL (use when n>=50)	2.222				95% Adjusted Gamma UCL (use when n<50)		2.509
1095												
1096					Lognormal GOF Test							
1097					Shapiro Wilk Test Statistic	0.944				Shapiro Wilk Lognormal GOF Test		
1098					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1099					Lilliefors Test Statistic	0.219				Lilliefors Lognormal GOF Test		
1100					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1101					Data appear Lognormal at 5% Significance Level							
1102												
1103					Lognormal Statistics							
1104					Minimum of Logged Data	-2.12				Mean of logged Data		-0.348
1105					Maximum of Logged Data	1.609				SD of logged Data		1.037
1106												

	A	B	C	D	E	F	G	H	I	J	K	L
1107	Assuming Lognormal Distribution											
1108					95% H-UCL	3.627				90% Chebyshev (MVUE) UCL		2.284
1109				95% Chebyshev (MVUE) UCL		2.81				97.5% Chebyshev (MVUE) UCL		3.54
1110				99% Chebyshev (MVUE) UCL		4.973						
1111												
1112	Nonparametric Distribution Free UCL Statistics											
1113	Data appear to follow a Discernible Distribution at 5% Significance Level											
1114												
1115	Nonparametric Distribution Free UCLs											
1116					95% CLT UCL	1.885				95% Jackknife UCL		1.969
1117				95% Standard Bootstrap UCL		1.842				95% Bootstrap-t UCL		3.063
1118				95% Hall's Bootstrap UCL		4.743				95% Percentile Bootstrap UCL		1.956
1119				95% BCA Bootstrap UCL		2.408						
1120				90% Chebyshev(Mean, Sd) UCL		2.491				95% Chebyshev(Mean, Sd) UCL		3.098
1121				97.5% Chebyshev(Mean, Sd) UCL		3.941				99% Chebyshev(Mean, Sd) UCL		5.596
1122												
1123	Suggested UCL to Use											
1124				95% Adjusted Gamma UCL		2.509						
1125												
1126	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1127	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1128	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1129	For additional insight the user may want to consult a statistician.											
1130												
1131												

	A	B	C	D	E	F	G	H	I	J	K	L
1132	Uranium											
1133												
1134						General Statistics						
1135					Total Number of Observations	10				Number of Distinct Observations		8
1136										Number of Missing Observations		0
1137					Minimum	7.19				Mean		80.06
1138					Maximum	214				Median		20
1139					SD	90.36				Std. Error of Mean		28.57
1140					Coefficient of Variation	1.129				Skewness		0.802
1141												
1142						Normal GOF Test						
1143					Shapiro Wilk Test Statistic	0.738				Shapiro Wilk GOF Test		
1144					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
1145					Lilliefors Test Statistic	0.347				Lilliefors GOF Test		
1146					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
1147						Data Not Normal at 5% Significance Level						
1148												
1149						Assuming Normal Distribution						
1150					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1151					95% Student's-t UCL	132.4				95% Adjusted-CLT UCL (Chen-1995)		134.8
1152										95% Modified-t UCL (Johnson-1978)		133.6
1153												
1154						Gamma GOF Test						
1155					A-D Test Statistic	0.894				Anderson-Darling Gamma GOF Test		
1156					5% A-D Critical Value	0.756				Data Not Gamma Distributed at 5% Significance Level		
1157					K-S Test Statistic	0.32				Kolmogrov-Smirnoff Gamma GOF Test		
1158					5% K-S Critical Value	0.276				Data Not Gamma Distributed at 5% Significance Level		
1159						Data Not Gamma Distributed at 5% Significance Level						
1160												
1161						Gamma Statistics						
1162					k hat (MLE)	0.772				k star (bias corrected MLE)		0.607
1163					Theta hat (MLE)	103.7				Theta star (bias corrected MLE)		131.9
1164					nu hat (MLE)	15.44				nu star (bias corrected)		12.14
1165					MLE Mean (bias corrected)	80.06				MLE Sd (bias corrected)		102.8
1166										Approximate Chi Square Value (0.05)		5.319
1167					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		4.559
1168												
1169						Assuming Gamma Distribution						
1170					95% Approximate Gamma UCL (use when n>=50))	182.7				95% Adjusted Gamma UCL (use when n<50)		213.2
1171												
1172						Lognormal GOF Test						
1173					Shapiro Wilk Test Statistic	0.845				Shapiro Wilk Lognormal GOF Test		
1174					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1175					Lilliefors Test Statistic	0.272				Lilliefors Lognormal GOF Test		
1176					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1177						Data appear Lognormal at 5% Significance Level						
1178												
1179						Lognormal Statistics						
1180					Minimum of Logged Data	1.973				Mean of logged Data		3.61
1181					Maximum of Logged Data	5.366				SD of logged Data		1.378
1182												

	A	B	C	D	E	F	G	H	I	J	K	L
1183	**Assuming Lognormal Distribution**											
1184					95% H-UCL	580.5				90% Chebyshev (MVUE) UCL		195.7
1185				95% Chebyshev (MVUE) UCL		247.1				97.5% Chebyshev (MVUE) UCL		318.5
1186				99% Chebyshev (MVUE) UCL		458.7						
1187												
1188	**Nonparametric Distribution Free UCL Statistics**											
1189	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1190												
1191	**Nonparametric Distribution Free UCLs**											
1192					95% CLT UCL	127.1				95% Jackknife UCL		132.4
1193				95% Standard Bootstrap UCL		125.3				95% Bootstrap-t UCL		144.5
1194				95% Hall's Bootstrap UCL		113.2				95% Percentile Bootstrap UCL		128.6
1195				95% BCA Bootstrap UCL		133.6						
1196				90% Chebyshev(Mean, Sd) UCL		165.8				95% Chebyshev(Mean, Sd) UCL		204.6
1197				97.5% Chebyshev(Mean, Sd) UCL		258.5				99% Chebyshev(Mean, Sd) UCL		364.4
1198												
1199	**Suggested UCL to Use**											
1200				95% Chebyshev (Mean, Sd) UCL		204.6						
1201												
1202	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1203	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1204	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1205	For additional insight the user may want to consult a statistician.											
1206												
1207												

	A	B	C	D	E	F	G	H	I	J	K	L
1208	Uranium-234											
1209												
1210						General Statistics						
1211					Total Number of Observations	10				Number of Distinct Observations		6
1212										Number of Missing Observations		0
1213					Minimum	0.72				Mean		2.192
1214					Maximum	6.91				Median		2.192
1215					SD	1.779				Std. Error of Mean		0.562
1216					Coefficient of Variation	0.811				Skewness		2.38
1217												
1218						Normal GOF Test						
1219					Shapiro Wilk Test Statistic	0.671				Shapiro Wilk GOF Test		
1220					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
1221					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
1222					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
1223						Data Not Normal at 5% Significance Level						
1224												
1225						Assuming Normal Distribution						
1226					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1227					95% Student's-t UCL	3.223				95% Adjusted-CLT UCL (Chen-1995)		3.57
1228										95% Modified-t UCL (Johnson-1978)		3.294
1229												
1230						Gamma GOF Test						
1231					A-D Test Statistic	0.855				Anderson-Darling Gamma GOF Test		
1232					5% A-D Critical Value	0.734				Data Not Gamma Distributed at 5% Significance Level		
1233					K-S Test Statistic	0.314				Kolmogrov-Smirnoff Gamma GOF Test		
1234					5% K-S Critical Value	0.269				Data Not Gamma Distributed at 5% Significance Level		
1235						Data Not Gamma Distributed at 5% Significance Level						
1236												
1237						Gamma Statistics						
1238					k hat (MLE)	2.417				k star (bias corrected MLE)		1.759
1239					Theta hat (MLE)	0.907				Theta star (bias corrected MLE)		1.246
1240					nu hat (MLE)	48.34				nu star (bias corrected)		35.17
1241					MLE Mean (bias corrected)	2.192				MLE Sd (bias corrected)		1.653
1242										Approximate Chi Square Value (0.05)		22.6
1243					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		20.87
1244												
1245						Assuming Gamma Distribution						
1246					95% Approximate Gamma UCL (use when n>=50))	3.411				95% Adjusted Gamma UCL (use when n<50)		3.695
1247												
1248						Lognormal GOF Test						
1249					Shapiro Wilk Test Statistic	0.856				Shapiro Wilk Lognormal GOF Test		
1250					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1251					Lilliefors Test Statistic	0.272				Lilliefors Lognormal GOF Test		
1252					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1253						Data appear Lognormal at 5% Significance Level						
1254												
1255						Lognormal Statistics						
1256					Minimum of Logged Data	-0.329				Mean of logged Data		0.564
1257					Maximum of Logged Data	1.933				SD of logged Data		0.678
1258												

	A	B	C	D	E	F	G	H	I	J	K	L
1259	Assuming Lognormal Distribution											
1260					95% H-UCL	3.886				90% Chebyshev (MVUE) UCL		3.579
1261				95% Chebyshev (MVUE) UCL		4.225				97.5% Chebyshev (MVUE) UCL		5.121
1262				99% Chebyshev (MVUE) UCL		6.881						
1263												
1264	Nonparametric Distribution Free UCL Statistics											
1265	Data appear to follow a Discernible Distribution at 5% Significance Level											
1266												
1267	Nonparametric Distribution Free UCLs											
1268					95% CLT UCL	3.117				95% Jackknife UCL		3.223
1269				95% Standard Bootstrap UCL		3.075				95% Bootstrap-t UCL		4.083
1270				95% Hall's Bootstrap UCL		7.02				95% Percentile Bootstrap UCL		3.168
1271				95% BCA Bootstrap UCL		3.588						
1272				90% Chebyshev(Mean, Sd) UCL		3.879				95% Chebyshev(Mean, Sd) UCL		4.644
1273				97.5% Chebyshev(Mean, Sd) UCL		5.705				99% Chebyshev(Mean, Sd) UCL		7.789
1274												
1275	Suggested UCL to Use											
1276					95% H-UCL	3.886						
1277												
1278	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1279	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1280	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1281	For additional insight the user may want to consult a statistician.											
1282												
1283	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
1284	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
1285	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
1286	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
1287												
1288												

	A	B	C	D	E	F	G	H	I	J	K	L
1289	Uranium-235											
1290												
1291						General Statistics						
1292					Total Number of Observations	10				Number of Distinct Observations		6
1293										Number of Missing Observations		0
1294					Minimum	0.026				Mean		0.128
1295					Maximum	0.438				Median		0.128
1296					SD	0.117				Std. Error of Mean		0.0371
1297					Coefficient of Variation	0.92				Skewness		2.348
1298												
1299						Normal GOF Test						
1300					Shapiro Wilk Test Statistic	0.678				Shapiro Wilk GOF Test		
1301					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
1302					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
1303					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
1304						Data Not Normal at 5% Significance Level						
1305												
1306						Assuming Normal Distribution						
1307					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1308					95% Student's-t UCL	0.196				95% Adjusted-CLT UCL (Chen-1995)		0.218
1309										95% Modified-t UCL (Johnson-1978)		0.2
1310												
1311						Gamma GOF Test						
1312					A-D Test Statistic	0.799				Anderson-Darling Gamma GOF Test		
1313					5% A-D Critical Value	0.737				Data Not Gamma Distributed at 5% Significance Level		
1314					K-S Test Statistic	0.3				Kolmogrov-Smirnoff Gamma GOF Test		
1315					5% K-S Critical Value	0.27				Data Not Gamma Distributed at 5% Significance Level		
1316						Data Not Gamma Distributed at 5% Significance Level						
1317												
1318						Gamma Statistics						
1319					k hat (MLE)	1.753				k star (bias corrected MLE)		1.294
1320					Theta hat (MLE)	0.0728				Theta star (bias corrected MLE)		0.0986
1321					nu hat (MLE)	35.07				nu star (bias corrected)		25.88
1322					MLE Mean (bias corrected)	0.128				MLE Sd (bias corrected)		0.112
1323										Approximate Chi Square Value (0.05)		15.29
1324					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		13.89
1325												
1326						Assuming Gamma Distribution						
1327					95% Approximate Gamma UCL (use when n>=50))	0.216				95% Adjusted Gamma UCL (use when n<50)		0.238
1328												
1329						Lognormal GOF Test						
1330					Shapiro Wilk Test Statistic	0.87				Shapiro Wilk Lognormal GOF Test		
1331					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1332					Lilliefors Test Statistic	0.256				Lilliefors Lognormal GOF Test		
1333					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1334						Data appear Lognormal at 5% Significance Level						
1335												
1336						Lognormal Statistics						
1337					Minimum of Logged Data	-3.65				Mean of logged Data		-2.371
1338					Maximum of Logged Data	-0.826				SD of logged Data		0.842
1339												

	A	B	C	D	E	F	G	H	I	J	K	L
1340	**Assuming Lognormal Distribution**											
1341					95% H-UCL	0.291				90% Chebyshev (MVUE) UCL		0.233
1342				95% Chebyshev (MVUE) UCL		0.281				97.5% Chebyshev (MVUE) UCL		0.348
1343				99% Chebyshev (MVUE) UCL		0.478						
1344												
1345	**Nonparametric Distribution Free UCL Statistics**											
1346	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1347												
1348	**Nonparametric Distribution Free UCLs**											
1349					95% CLT UCL	0.189				95% Jackknife UCL		0.196
1350				95% Standard Bootstrap UCL		0.185				95% Bootstrap-t UCL		0.25
1351				95% Hall's Bootstrap UCL		0.449				95% Percentile Bootstrap UCL		0.194
1352				95% BCA Bootstrap UCL		0.219						
1353				90% Chebyshev(Mean, Sd) UCL		0.239				95% Chebyshev(Mean, Sd) UCL		0.289
1354				97.5% Chebyshev(Mean, Sd) UCL		0.359				99% Chebyshev(Mean, Sd) UCL		0.497
1355												
1356	**Suggested UCL to Use**											
1357					95% H-UCL	0.291						
1358												
1359	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1360	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1361	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1362	For additional insight the user may want to consult a statistician.											
1363												
1364	**ProUCL computes and outputs H-statistic based UCLs for historical reasons only.**											
1365	**H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.**											
1366	**It is therefore recommended to avoid the use of H-statistic based 95% UCLs.**											
1367	**Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.**											
1368												
1369												

	A	B	C	D	E	F	G	H	I	J	K	L
1370	Uranium-238											
1371												
1372						General Statistics						
1373					Total Number of Observations	10				Number of Distinct Observations		6
1374										Number of Missing Observations		0
1375					Minimum	0.81				Mean		3.108
1376					Maximum	9.45				Median		3.108
1377					SD	2.419				Std. Error of Mean		0.765
1378					Coefficient of Variation	0.778				Skewness		2.246
1379												
1380						Normal GOF Test						
1381					Shapiro Wilk Test Statistic	0.694				Shapiro Wilk GOF Test		
1382					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
1383					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
1384					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
1385						Data Not Normal at 5% Significance Level						
1386												
1387						Assuming Normal Distribution						
1388					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1389					95% Student's-t UCL	4.51				95% Adjusted-CLT UCL (Chen-1995)		4.947
1390										95% Modified-t UCL (Johnson-1978)		4.601
1391												
1392						Gamma GOF Test						
1393					A-D Test Statistic	0.853				Anderson-Darling Gamma GOF Test		
1394					5% A-D Critical Value	0.734				Data Not Gamma Distributed at 5% Significance Level		
1395					K-S Test Statistic	0.314				Kolmogrov-Smirnoff Gamma GOF Test		
1396					5% K-S Critical Value	0.269				Data Not Gamma Distributed at 5% Significance Level		
1397						Data Not Gamma Distributed at 5% Significance Level						
1398												
1399						Gamma Statistics						
1400					k hat (MLE)	2.376				k star (bias corrected MLE)		1.73
1401					Theta hat (MLE)	1.308				Theta star (bias corrected MLE)		1.797
1402					nu hat (MLE)	47.51				nu star (bias corrected)		34.59
1403					MLE Mean (bias corrected)	3.108				MLE Sd (bias corrected)		2.363
1404										Approximate Chi Square Value (0.05)		22.14
1405					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		20.42
1406												
1407						Assuming Gamma Distribution						
1408					95% Approximate Gamma UCL (use when n>=50))	4.856				95% Adjusted Gamma UCL (use when n<50)		5.264
1409												
1410						Lognormal GOF Test						
1411					Shapiro Wilk Test Statistic	0.857				Shapiro Wilk Lognormal GOF Test		
1412					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1413					Lilliefors Test Statistic	0.276				Lilliefors Lognormal GOF Test		
1414					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1415						Data appear Lognormal at 5% Significance Level						
1416												
1417						Lognormal Statistics						
1418					Minimum of Logged Data	-0.211				Mean of logged Data		0.909
1419					Maximum of Logged Data	2.246				SD of logged Data		0.712
1420												

	A	B	C	D	E	F	G	H	I	J	K	L
1421	Assuming Lognormal Distribution											
1422					95% H-UCL	5.858				90% Chebyshev (MVUE) UCL		5.265
1423				95% Chebyshev (MVUE) UCL		6.244				97.5% Chebyshev (MVUE) UCL		7.604
1424				99% Chebyshev (MVUE) UCL		10.27						
1425												
1426	Nonparametric Distribution Free UCL Statistics											
1427	Data appear to follow a Discernible Distribution at 5% Significance Level											
1428												
1429	Nonparametric Distribution Free UCLs											
1430					95% CLT UCL	4.366				95% Jackknife UCL		4.51
1431				95% Standard Bootstrap UCL		4.324				95% Bootstrap-t UCL		5.455
1432				95% Hall's Bootstrap UCL		10.01				95% Percentile Bootstrap UCL		4.417
1433				95% BCA Bootstrap UCL		4.831						
1434				90% Chebyshev(Mean, Sd) UCL		5.403				95% Chebyshev(Mean, Sd) UCL		6.442
1435				97.5% Chebyshev(Mean, Sd) UCL		7.884				99% Chebyshev(Mean, Sd) UCL		10.72
1436												
1437	Suggested UCL to Use											
1438					95% H-UCL	5.858						
1439												
1440	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1441	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1442	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1443	For additional insight the user may want to consult a statistician.											
1444												
1445	ProUCL computes and outputs H-statistic based UCLs for historical reasons only.											
1446	H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.											
1447	It is therefore recommended to avoid the use of H-statistic based 95% UCLs.											
1448	Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.											
1449												
1450												

	A	B	C	D	E	F	G	H	I	J	K	L
1451	Vanadium											
1452												
1453						General Statistics						
1454					Total Number of Observations	10				Number of Distinct Observations		10
1455										Number of Missing Observations		0
1456					Minimum	60				Mean		119.3
1457					Maximum	195				Median		114
1458					SD	40.16				Std. Error of Mean		12.7
1459					Coefficient of Variation	0.337				Skewness		0.335
1460												
1461						Normal GOF Test						
1462					Shapiro Wilk Test Statistic	0.973				Shapiro Wilk GOF Test		
1463					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
1464					Lilliefors Test Statistic	0.143				Lilliefors GOF Test		
1465					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
1466						Data appear Normal at 5% Significance Level						
1467												
1468						Assuming Normal Distribution						
1469					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
1470					95% Student's-t UCL	142.6				95% Adjusted-CLT UCL (Chen-1995)		141.6
1471										95% Modified-t UCL (Johnson-1978)		142.8
1472												
1473						Gamma GOF Test						
1474					A-D Test Statistic	0.211				Anderson-Darling Gamma GOF Test		
1475					5% A-D Critical Value	0.726				Detected data appear Gamma Distributed at 5% Significance Level		
1476					K-S Test Statistic	0.147				Kolmogrov-Smirnoff Gamma GOF Test		
1477					5% K-S Critical Value	0.267				Detected data appear Gamma Distributed at 5% Significance Level		
1478						Detected data appear Gamma Distributed at 5% Significance Level						
1479												
1480						Gamma Statistics						
1481					k hat (MLE)	9.331				k star (bias corrected MLE)		6.598
1482					Theta hat (MLE)	12.79				Theta star (bias corrected MLE)		18.08
1483					nu hat (MLE)	186.6				nu star (bias corrected)		132
1484					MLE Mean (bias corrected)	119.3				MLE Sd (bias corrected)		46.44
1485										Approximate Chi Square Value (0.05)		106.4
1486					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		102.4
1487												
1488						Assuming Gamma Distribution						
1489					95% Approximate Gamma UCL (use when n>=50))	147.9				95% Adjusted Gamma UCL (use when n<50)		153.7
1490												
1491						Lognormal GOF Test						
1492					Shapiro Wilk Test Statistic	0.962				Shapiro Wilk Lognormal GOF Test		
1493					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
1494					Lilliefors Test Statistic	0.17				Lilliefors Lognormal GOF Test		
1495					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
1496						Data appear Lognormal at 5% Significance Level						
1497												
1498						Lognormal Statistics						
1499					Minimum of Logged Data	4.094				Mean of logged Data		4.727
1500					Maximum of Logged Data	5.273				SD of logged Data		0.357
1501												

	A	B	C	D	E	F	G	H	I	J	K	L
1502	**Assuming Lognormal Distribution**											
1503					95% H-UCL	153.4				90% Chebyshev (MVUE) UCL		160.5
1504				95% Chebyshev (MVUE) UCL		179				97.5% Chebyshev (MVUE) UCL		204.7
1505				99% Chebyshev (MVUE) UCL		255.2						
1506												
1507	**Nonparametric Distribution Free UCL Statistics**											
1508	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
1509												
1510	**Nonparametric Distribution Free UCLs**											
1511					95% CLT UCL	140.2				95% Jackknife UCL		142.6
1512				95% Standard Bootstrap UCL		139.3				95% Bootstrap-t UCL		144.5
1513				95% Hall's Bootstrap UCL		145.2				95% Percentile Bootstrap UCL		139.3
1514				95% BCA Bootstrap UCL		139.2						
1515				90% Chebyshev(Mean, Sd) UCL		157.4				95% Chebyshev(Mean, Sd) UCL		174.7
1516				97.5% Chebyshev(Mean, Sd) UCL		198.6				99% Chebyshev(Mean, Sd) UCL		245.6
1517												
1518	**Suggested UCL to Use**											
1519				95% Student's-t UCL		142.6						
1520												
1521	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1522	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1523	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1524	For additional insight the user may want to consult a statistician.											
1525												