UCL Statistics for Data Sets with Non-Detects

User Selected Options	
e/Time of Computation	8/13/2015 2:57:45 PM
From File	ProUCLinput_C-12-002_0-5.xls
Full Precision	OFF
Confidence Coefficient	95%
f Bootstrap Operations	2000

Aluminum

General Statistics

Total Number of Observations	10	Number of Distinct Observations	10
		Number of Missing Observations	0
Minimum	6790	Mean	9821
Maximum	12800	Median	9875
SD	2148	Std. Error of Mean	679.1
Coefficient of Variation	0.21	Skewness	-0.10

Normal GOF Test

Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.84	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.16	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.28	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	11066	95% Adjusted-CLT UCL (Chen-1995)	10914
		95% Modified-t UCL (Johnson-1978)	11062

Gamma GOF Test

A-D Test Statistic	0.36	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.72	d data appear Gamma Distributed at 5% Significan
K-S Test Statistic	0.18	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.26	d data appear Gamma Distributed at 5% Significan

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	22.29	k star (bias corrected MLE)	15.6
Theta hat (MLE)	440.6	Theta star (bias corrected MLE)	626.7
nu hat (MLE)	445.8	nu star (bias corrected)	313.4
MLE Mean (bias corrected)	9821	MLE Sd (bias corrected)	2481
		Approximate Chi Square Value (0.05)	273.4
Adjusted Level of Significance	0.026	Adjusted Chi Square Value	266.9

Assuming Gamma Distribution

oximate Gamma UCL (use when n>=50))	11258	Adjusted Gamma UCL (use when n<50)	11533

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.92	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk Critical Value	0.84	Data appear Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**
5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level

Data appear Lognormal at 5% Significance Level

Lognormal Statistics

Minimum of Logged Data	8.82	Mean of logged Data	9.17
Maximum of Logged Data	9.45	SD of logged Data	0.22

Assuming Lognormal Distribution

95% H-UCL	11379	90% Chebyshev (MVUE) UCL	11951

64	95% Chebyshev (MVUE) UCL				12913	97.5% Chebyshev (MVUE) UCL					14248	
65	99% Chebyshev (MVUE) UCL				16872							
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				10938	95% Jackknife UCL					11066	
72	95% Standard Bootstrap UCL				10886	95% Bootstrap-t UCL					11057	
73	95% Hall's Bootstrap UCL				10836	95% Percentile Bootstrap UCL					10902	
74	95% BCA Bootstrap UCL				10885							
75	90% Chebyshev(Mean, Sd) UCL				11858	95% Chebyshev(Mean, Sd) UCL					12781	
76	97.5% Chebyshev(Mean, Sd) UCL				14062	99% Chebyshev(Mean, Sd) UCL					16578	
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL				11066							
80												
81	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
82	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
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	**highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may**											
87	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
88												
89												
90	**Barium**											
91												
92	**General Statistics**											
93	Total Number of Observations				10	Number of Distinct Observations					10	
94						Number of Missing Observations					0	
95	Minimum				95.5	Mean					187.8	
96	Maximum				275	Median					195.5	
97	SD				61.5	Std. Error of Mean					19.4	
98	Coefficient of Variation				0.32	Skewness					-0.10	
99												
100	**Normal GOF Test**											
101	Shapiro Wilk Test Statistic				0.94	**Shapiro Wilk GOF Test**						
102	5% Shapiro Wilk Critical Value				0.84	Data appear Normal at 5% Significance Level						
103	Lilliefors Test Statistic				0.16	**Lilliefors GOF Test**						
104	5% Lilliefors Critical Value				0.28	Data appear Normal at 5% Significance Level						
105	**Data appear Normal at 5% Significance Level**											
106												
107	**Assuming Normal Distribution**											
108	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
109	95% Student's-t UCL				223.4	95% Adjusted-CLT UCL (Chen-1995)					219.1	
110						95% Modified-t UCL (Johnson-1978)					223.3	
111												
112	**Gamma GOF Test**											
113	A-D Test Statistic				0.33	**Anderson-Darling Gamma GOF Test**						
114	5% A-D Critical Value				0.72	d data appear Gamma Distributed at 5% Significar						
115	K-S Test Statistic				0.19	**Kolmogrov-Smirnoff Gamma GOF Test**						
116	5% K-S Critical Value				0.26	d data appear Gamma Distributed at 5% Significar						
117	**Detected data appear Gamma Distributed at 5% Significance Level**											
118												
119	**Gamma Statistics**											
120	k hat (MLE)				9.46	k star (bias corrected MLE)					6.69	
121	Theta hat (MLE)				19.8	Theta star (bias corrected MLE)					28.0	
122	nu hat (MLE)				189.3	nu star (bias corrected)					133.8	
123	MLE Mean (bias corrected)				187.8	MLE Sd (bias corrected)					72.5	
124						Approximate Chi Square Value (0.05)					108.1	
125	Adjusted Level of Significance				0.02	Adjusted Chi Square Value					104.1	
126												

127	**Assuming Gamma Distribution**											
128	oximate Gamma UCL (use when n>=50))				232.4	ɔ Adjusted Gamma UCL (use when n<50)						241.4
129												
130	**Lognormal GOF Test**											
131	Shapiro Wilk Test Statistic				0.93	**Shapiro Wilk Lognormal GOF Test**						
132	5% Shapiro Wilk Critical Value				0.84	Data appear Lognormal at 5% Significance Level						
133	Lilliefors Test Statistic				0.19	**Lilliefors Lognormal GOF Test**						
134	5% Lilliefors Critical Value				0.28	Data appear Lognormal at 5% Significance Level						
135	**Data appear Lognormal at 5% Significance Level**											
136												
137	**Lognormal Statistics**											
138	Minimum of Logged Data				4.55	Mean of logged Data						5.18
139	Maximum of Logged Data				5.61	SD of logged Data						0.35
140												
141	**Assuming Lognormal Distribution**											
142	95% H-UCL				241.3	90% Chebyshev (MVUE) UCL						252.4
143	95% Chebyshev (MVUE) UCL				281.5	97.5% Chebyshev (MVUE) UCL						321.8
144	99% Chebyshev (MVUE) UCL				401.1							
145												
146	**Nonparametric Distribution Free UCL Statistics**											
147	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
148												
149	**Nonparametric Distribution Free UCLs**											
150	95% CLT UCL				219.8	95% Jackknife UCL						223.4
151	95% Standard Bootstrap UCL				218.9	95% Bootstrap-t UCL						221.8
152	95% Hall's Bootstrap UCL				216.8	95% Percentile Bootstrap UCL						218.1
153	95% BCA Bootstrap UCL				217.2							
154	90% Chebyshev(Mean, Sd) UCL				246.1	95% Chebyshev(Mean, Sd) UCL						272.6
155	97.5% Chebyshev(Mean, Sd) UCL				309.3	99% Chebyshev(Mean, Sd) UCL						381.4
156												
157	**Suggested UCL to Use**											
158	95% Student's-t UCL				223.4							
159												
160	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
161	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
162	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
163	For additional insight the user may want to consult a statistician.											
164												
165	**highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may**											
166	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
167												
168												
169	**Calcium**											
170												
171	**General Statistics**											
172	Total Number of Observations				10	Number of Distinct Observations						9
173						Number of Missing Observations						0
174	Minimum				1530	Mean						2345
175	Maximum				3360	Median						2345
176	SD				493.5	Std. Error of Mean						156.1
177	Coefficient of Variation				0.21	Skewness						0.48
178												
179	**Normal GOF Test**											
180	Shapiro Wilk Test Statistic				0.95	**Shapiro Wilk GOF Test**						
181	5% Shapiro Wilk Critical Value				0.84	Data appear Normal at 5% Significance Level						
182	Lilliefors Test Statistic				0.17	**Lilliefors GOF Test**						
183	5% Lilliefors Critical Value				0.28	Data appear Normal at 5% Significance Level						
184	**Data appear Normal at 5% Significance Level**											
185												
186	**Assuming Normal Distribution**											
187	**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**						
188	95% Student's-t UCL				2631	95% Adjusted-CLT UCL (Chen-1995)						2627
189						95% Modified-t UCL (Johnson-1978)						2635

190												
191						**Gamma GOF Test**						
192					A-D Test Statistic	0.28	**Anderson-Darling Gamma GOF Test**					
193					5% A-D Critical Value	0.72	d data appear Gamma Distributed at 5% Significar					
194					K-S Test Statistic	0.15	**Kolmogrov-Smirnoff Gamma GOF Test**					
195					5% K-S Critical Value	0.26	d data appear Gamma Distributed at 5% Significar					
196					**Detected data appear Gamma Distributed at 5% Significance Level**							
197												
198					**Gamma Statistics**							
199					k hat (MLE)	25.0	k star (bias corrected MLE)	17.6				
200					Theta hat (MLE)	93.6	Theta star (bias corrected MLE)	133.3				
201					nu hat (MLE)	500.9	nu star (bias corrected)	351.9				
202					MLE Mean (bias corrected)	2345	MLE Sd (bias corrected)	559				
203							Approximate Chi Square Value (0.05)	309.5				
204					Adjusted Level of Significance	0.02	Adjusted Chi Square Value	302.5				
205												
206					**Assuming Gamma Distribution**							
207	oximate Gamma UCL (use when n>=50))					2667	Adjusted Gamma UCL (use when n<50)	2728				
208												
209					**Lognormal GOF Test**							
210					Shapiro Wilk Test Statistic	0.96	**Shapiro Wilk Lognormal GOF Test**					
211					5% Shapiro Wilk Critical Value	0.84	Data appear Lognormal at 5% Significance Level					
212					Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**					
213					5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level					
214					**Data appear Lognormal at 5% Significance Level**							
215												
216					**Lognormal Statistics**							
217					Minimum of Logged Data	7.33	Mean of logged Data	7.74				
218					Maximum of Logged Data	8.12	SD of logged Data	0.21				
219												
220					**Assuming Lognormal Distribution**							
221					95% H-UCL	2689	90% Chebyshev (MVUE) UCL	2821				
222					95% Chebyshev (MVUE) UCL	3037	97.5% Chebyshev (MVUE) UCL	3336				
223					99% Chebyshev (MVUE) UCL	3923						
224												
225					**Nonparametric Distribution Free UCL Statistics**							
226					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
227												
228					**Nonparametric Distribution Free UCLs**							
229					95% CLT UCL	2602	95% Jackknife UCL	2631				
230					95% Standard Bootstrap UCL	2589	95% Bootstrap-t UCL	2655				
231					95% Hall's Bootstrap UCL	2756	95% Percentile Bootstrap UCL	2592				
232					95% BCA Bootstrap UCL	2610						
233					90% Chebyshev(Mean, Sd) UCL	2813	95% Chebyshev(Mean, Sd) UCL	3025				
234					97.5% Chebyshev(Mean, Sd) UCL	3320	99% Chebyshev(Mean, Sd) UCL	3898				
235												
236					**Suggested UCL to Use**							
237					95% Student's-t UCL	2631						
238												
239	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
240	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
241	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
242	For additional insight the user may want to consult a statistician.											
243												
244												
245	**Chromium**											
246												
247					**General Statistics**							
248					Total Number of Observations	10	Number of Distinct Observations	10				
249							Number of Missing Observations	0				
250					Minimum	8.79	Mean	12.5				
251					Maximum	23	Median	11.7				
252					SD	4.22	Std. Error of Mean	1.33				

253			Coefficient of Variation			0.33					Skewness	1.92
254												
255						**Normal GOF Test**						
256			Shapiro Wilk Test Statistic			0.79			**Shapiro Wilk GOF Test**			
257			5% Shapiro Wilk Critical Value			0.84			Data Not Normal at 5% Significance Level			
258			Lilliefors Test Statistic			0.25			**Lilliefors GOF Test**			
259			5% Lilliefors Critical Value			0.28			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	15.0				95% Adjusted-CLT UCL (Chen-1995)		15.6
265										95% Modified-t UCL (Johnson-1978)		15.1
266												
267						**Gamma GOF Test**						
268			A-D Test Statistic			0.56			**Anderson-Darling Gamma GOF Test**			
269			5% A-D Critical Value			0.72	d data appear Gamma Distributed at 5% Significar					
270			K-S Test Statistic			0.20			**Kolmogrov-Smirnoff Gamma GOF Test**			
271			5% K-S Critical Value			0.26	d data appear Gamma Distributed at 5% Significar					
272						**Detected data appear Gamma Distributed at 5% Significance Level**						
273												
274						**Gamma Statistics**						
275					k hat (MLE)	12.3				k star (bias corrected MLE)		8.69
276					Theta hat (MLE)	1.02				Theta star (bias corrected MLE)		1.44
277					nu hat (MLE)	246.5				nu star (bias corrected)		173.9
278					MLE Mean (bias corrected)	12.5				MLE Sd (bias corrected)		4.26
279										Approximate Chi Square Value (0.05)		144.4
280					Adjusted Level of Significance	0.026				Adjusted Chi Square Value		139.7
281												
282						**Assuming Gamma Distribution**						
283	oximate Gamma UCL (use when n>=50))					15.1	Adjusted Gamma UCL (use when n<50)					15.6
284												
285						**Lognormal GOF Test**						
286					Shapiro Wilk Test Statistic	0.89			**Shapiro Wilk Lognormal GOF Test**			
287					5% Shapiro Wilk Critical Value	0.84	Data appear Lognormal at 5% Significance Level					
288					Lilliefors Test Statistic	0.18			**Lilliefors Lognormal GOF Test**			
289					5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level					
290						**Data appear Lognormal at 5% Significance Level**							
291												
292						**Lognormal Statistics**						
293					Minimum of Logged Data	2.17				Mean of logged Data		2.49
294					Maximum of Logged Data	3.13				SD of logged Data		0.28
295												
296						**Assuming Lognormal Distribution**							
297					95% H-UCL	15.1				90% Chebyshev (MVUE) UCL		15.9
298					95% Chebyshev (MVUE) UCL	17.5				97.5% Chebyshev (MVUE) UCL		19.6
299					99% Chebyshev (MVUE) UCL	23.9						
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	14.7				95% Jackknife UCL		15.0
306					95% Standard Bootstrap UCL	14.6				95% Bootstrap-t UCL		17.6
307					95% Hall's Bootstrap UCL	26.2				95% Percentile Bootstrap UCL		14.8
308					95% BCA Bootstrap UCL	15.5						
309					90% Chebyshev(Mean, Sd) UCL	16.5				95% Chebyshev(Mean, Sd) UCL		18.4
310					97.5% Chebyshev(Mean, Sd) UCL	20.9				99% Chebyshev(Mean, Sd) UCL		25.8
311												
312						**Suggested UCL to Use**							
313					95% Student's-t UCL	15.0						
314												
315	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											

316	mmendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
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												
321	**Cobalt**											
322												
323	**General Statistics**											
324	Total Number of Observations					10		Number of Distinct Observations				10
325								Number of Missing Observations				0
326	Minimum					4.66		Mean				6.24
327	Maximum					12.1		Median				5.65
328	SD					2.13		Std. Error of Mean				0.67
329	Coefficient of Variation					0.34		Skewness				2.72
330												
331	**Normal GOF Test**											
332	Shapiro Wilk Test Statistic					0.63		**Shapiro Wilk GOF Test**				
333	5% Shapiro Wilk Critical Value					0.84		Data Not Normal at 5% Significance Level				
334	Lilliefors Test Statistic					0.32		**Lilliefors GOF Test**				
335	5% Lilliefors Critical Value					0.28		Data Not Normal at 5% Significance Level				
336	**Data Not 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					7.48		95% Adjusted-CLT UCL (Chen-1995)				7.98
341								95% Modified-t UCL (Johnson-1978)				7.58
342												
343	**Gamma GOF Test**											
344	A-D Test Statistic					1.17		**Anderson-Darling Gamma GOF Test**				
345	5% A-D Critical Value					0.72		ata Not Gamma Distributed at 5% Significance Lev				
346	K-S Test Statistic					0.27		**Kolmogrov-Smirnoff Gamma GOF Test**				
347	5% K-S Critical Value					0.26		ata Not Gamma Distributed at 5% Significance Lev				
348	**Data Not Gamma Distributed at 5% Significance Level**											
349												
350	**Gamma Statistics**											
351	k hat (MLE)					13.39		k star (bias corrected MLE)				9.44
352	Theta hat (MLE)					0.46		Theta star (bias corrected MLE)				0.66
353	nu hat (MLE)					267.9		nu star (bias corrected)				188.9
354	MLE Mean (bias corrected)					6.24		MLE Sd (bias corrected)				2.03
355								Approximate Chi Square Value (0.05)				158.1
356	Adjusted Level of Significance					0.026		Adjusted Chi Square Value				153.2
357												
358	**Assuming Gamma Distribution**											
359	oximate Gamma UCL (use when n>=50))					7.46		Adjusted Gamma UCL (use when n<50)				7.70
360												
361	**Lognormal GOF Test**											
362	Shapiro Wilk Test Statistic					0.74		**Shapiro Wilk Lognormal GOF Test**				
363	5% Shapiro Wilk Critical Value					0.84		Data Not Lognormal at 5% Significance Level				
364	Lilliefors Test Statistic					0.25		**Lilliefors Lognormal GOF Test**				
365	5% Lilliefors Critical Value					0.28		Data appear Lognormal at 5% Significance Level				
366	**Data appear Approximate Lognormal at 5% Significance Level**											
367												
368	**Lognormal Statistics**											
369	Minimum of Logged Data					1.53		Mean of logged Data				1.79
370	Maximum of Logged Data					2.49		SD of logged Data				0.26
371												
372	**Assuming Lognormal Distribution**											
373	95% H-UCL					7.41		90% Chebyshev (MVUE) UCL				7.79
374	95% Chebyshev (MVUE) UCL					8.51		97.5% Chebyshev (MVUE) UCL				9.50
375	99% Chebyshev (MVUE) UCL					11.46						
376												
377	**Nonparametric Distribution Free UCL Statistics**											
378	**Data appear to follow a Discernible Distribution at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
379												
380	**Nonparametric Distribution Free UCLs**											
381					95% CLT UCL	7.36			95% Jackknife UCL			7.48
382					95% Standard Bootstrap UCL	7.3			95% Bootstrap-t UCL			9.82
383					95% Hall's Bootstrap UCL	11.9			95% Percentile Bootstrap UCL			7.51
384					95% BCA Bootstrap UCL	8.14						
385					90% Chebyshev(Mean, Sd) UCL	8.27			95% Chebyshev(Mean, Sd) UCL			9.19
386					97.5% Chebyshev(Mean, Sd) UCL	10.4			99% Chebyshev(Mean, Sd) UCL			12.9
387												
388	**Suggested UCL to Use**											
389					95% Student's-t UCL	7.48			or 95% Modified-t UCL			7.58
390												
391	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
392	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
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												
397	**Copper**											
398												
399	**General Statistics**											
400					Total Number of Observations	10			Number of Distinct Observations			10
401									Number of Missing Observations			0
402					Minimum	5.04			Mean			7.04
403					Maximum	8.7			Median			7.21
404					SD	1.04			Std. Error of Mean			0.32
405					Coefficient of Variation	0.14			Skewness			-0.52
406												
407	**Normal GOF Test**											
408					Shapiro Wilk Test Statistic	0.95			**Shapiro Wilk GOF Test**			
409					5% Shapiro Wilk Critical Value	0.84			Data appear Normal at 5% Significance Level			
410					Lilliefors Test Statistic	0.22			**Lilliefors GOF Test**			
411					5% Lilliefors Critical Value	0.28			Data appear Normal at 5% Significance Level			
412	**Data appear 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	7.65			95% Adjusted-CLT UCL (Chen-1995)			7.53
417									95% Modified-t UCL (Johnson-1978)			7.64
418												
419	**Gamma GOF Test**											
420					A-D Test Statistic	0.37			**Anderson-Darling Gamma GOF Test**			
421					5% A-D Critical Value	0.72			d data appear Gamma Distributed at 5% Significar			
422					K-S Test Statistic	0.24			**Kolmogrov-Smirnoff Gamma GOF Test**			
423					5% K-S Critical Value	0.26			d data appear Gamma Distributed at 5% Significar			
424	**Detected data appear Gamma Distributed at 5% Significance Level**											
425												
426	**Gamma Statistics**											
427					k hat (MLE)	47.6			k star (bias corrected MLE)			33.4
428					Theta hat (MLE)	0.14			Theta star (bias corrected MLE)			0.21
429					nu hat (MLE)	952.8			nu star (bias corrected)			668.3
430					MLE Mean (bias corrected)	7.04			MLE Sd (bias corrected)			1.21
431									Approximate Chi Square Value (0.05)			609.3
432					Adjusted Level of Significance	0.026			Adjusted Chi Square Value			599.5
433												
434	**Assuming Gamma Distribution**											
435	oximate Gamma UCL (use when n>=50))					7.73			Adjusted Gamma UCL (use when n<50)			7.85
436												
437	**Lognormal GOF Test**											
438					Shapiro Wilk Test Statistic	0.93			**Shapiro Wilk Lognormal GOF Test**			
439					5% Shapiro Wilk Critical Value	0.84			Data appear Lognormal at 5% Significance Level			
440					Lilliefors Test Statistic	0.24			**Lilliefors Lognormal GOF Test**			
441					5% Lilliefors Critical Value	0.28			Data appear Lognormal at 5% Significance Level			

	A	B	C	D	E	F	G	H	I	J	K	L
442	**Data appear Lognormal at 5% Significance Level**											
443												
444	**Lognormal Statistics**											
445					Minimum of Logged Data	1.61			Mean of logged Data			1.94
446					Maximum of Logged Data	2.16			SD of logged Data			0.15
447												
448	**Assuming Lognormal Distribution**											
449					95% H-UCL	7.77			90% Chebyshev (MVUE) UCL			8.09
450					95% Chebyshev (MVUE) UCL	8.57			97.5% Chebyshev (MVUE) UCL			9.22
451					99% Chebyshev (MVUE) UCL	10.5						
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	7.59			95% Jackknife UCL			7.65
458					95% Standard Bootstrap UCL	7.57			95% Bootstrap-t UCL			7.56
459					95% Hall's Bootstrap UCL	7.56			95% Percentile Bootstrap UCL			7.57
460					95% BCA Bootstrap UCL	7.51						
461					90% Chebyshev(Mean, Sd) UCL	8.03			95% Chebyshev(Mean, Sd) UCL			8.48
462					97.5% Chebyshev(Mean, Sd) UCL	9.10			99% Chebyshev(Mean, Sd) UCL			10.3
463												
464	**Suggested UCL to Use**											
465					95% Student's-t UCL	7.65						
466												
467	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
468	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
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	**highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may**											
473	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
474												
475												
476	**Magnesium**											
477												
478	**General Statistics**											
479					Total Number of Observations	10			Number of Distinct Observations			9
480									Number of Missing Observations			0
481					Minimum	1380			Mean			1943
482					Maximum	2660			Median			1790
483					SD	406.6			Std. Error of Mean			128.6
484					Coefficient of Variation	0.20			Skewness			0.62
485												
486	**Normal GOF Test**											
487					Shapiro Wilk Test Statistic	0.92			**Shapiro Wilk GOF Test**			
488					5% Shapiro Wilk Critical Value	0.84			Data appear Normal at 5% Significance Level			
489					Lilliefors Test Statistic	0.22			**Lilliefors GOF Test**			
490					5% Lilliefors Critical Value	0.28			Data appear Normal at 5% Significance Level			
491	**Data appear Normal at 5% Significance Level**											
492												
493	**Assuming Normal Distribution**											
494	**95% Normal UCL**								**95% UCLs (Adjusted for Skewness)**			
495					95% Student's-t UCL	2179			95% Adjusted-CLT UCL (Chen-1995)			2182
496									95% Modified-t UCL (Johnson-1978)			2183
497												
498	**Gamma GOF Test**											
499					A-D Test Statistic	0.37			**Anderson-Darling Gamma GOF Test**			
500					5% A-D Critical Value	0.72			d data appear Gamma Distributed at 5% Significar			
501					K-S Test Statistic	0.21			**Kolmogrov-Smirnoff Gamma GOF Test**			
502					5% K-S Critical Value	0.26			d data appear Gamma Distributed at 5% Significar			
503	**Detected data appear Gamma Distributed at 5% Significance Level**											
504												

505	**Gamma Statistics**											
506					k hat (MLE)	26.3			k star (bias corrected MLE)			18.5
507					Theta hat (MLE)	73.65			Theta star (bias corrected MLE)			104.8
508					nu hat (MLE)	527.6			nu star (bias corrected)			370.7
509					MLE Mean (bias corrected)	1943			MLE Sd (bias corrected)			451.3
510									Approximate Chi Square Value (0.05)			327
511					Adjusted Level of Significance	0.026			Adjusted Chi Square Value			319.9
512												
513	**Assuming Gamma Distribution**											
514	oximate Gamma UCL (use when n>=50))					2202	ɔ		Adjusted Gamma UCL (use when n<50)			2251
515												
516	**Lognormal GOF Test**											
517					Shapiro Wilk Test Statistic	0.95			**Shapiro Wilk Lognormal GOF Test**			
518					5% Shapiro Wilk Critical Value	0.84			Data appear Lognormal at 5% Significance Level			
519					Lilliefors Test Statistic	0.2			**Lilliefors Lognormal GOF Test**			
520					5% Lilliefors Critical Value	0.28			Data appear Lognormal at 5% Significance Level			
521	**Data appear Lognormal at 5% Significance Level**											
522												
523	**Lognormal Statistics**											
524					Minimum of Logged Data	7.23			Mean of logged Data			7.55
525					Maximum of Logged Data	7.88			SD of logged Data			0.20
526												
527	**Assuming Lognormal Distribution**											
528					95% H-UCL	2213			90% Chebyshev (MVUE) UCL			2321
529					95% Chebyshev (MVUE) UCL	2492			97.5% Chebyshev (MVUE) UCL			2729
530					99% Chebyshev (MVUE) UCL	3196						
531												
532	**Nonparametric Distribution Free UCL Statistics**											
533	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
534												
535	**Nonparametric Distribution Free UCLs**											
536					95% CLT UCL	2154			95% Jackknife UCL			2179
537					95% Standard Bootstrap UCL	2147			95% Bootstrap-t UCL			2214
538					95% Hall's Bootstrap UCL	2171			95% Percentile Bootstrap UCL			2158
539					95% BCA Bootstrap UCL	2167						
540					90% Chebyshev(Mean, Sd) UCL	2329			95% Chebyshev(Mean, Sd) UCL			2503
541					97.5% Chebyshev(Mean, Sd) UCL	2746			99% Chebyshev(Mean, Sd) UCL			3222
542												
543	**Suggested UCL to Use**											
544					95% Student's-t UCL	2179						
545												
546	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
547	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
548	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
549	For additional insight the user may want to consult a statistician.											
550												
551												
552	**Manganese**											
553												
554	**General Statistics**											
555					Total Number of Observations	10			Number of Distinct Observations			10
556									Number of Missing Observations			0
557					Minimum	197			Mean			362
558					Maximum	1070			Median			295.5
559					SD	252.4			Std. Error of Mean			79.8
560					Coefficient of Variation	0.69			Skewness			2.99
561												
562	**Normal GOF Test**											
563					Shapiro Wilk Test Statistic	0.53			**Shapiro Wilk GOF Test**			
564					5% Shapiro Wilk Critical Value	0.84			Data Not Normal at 5% Significance Level			
565					Lilliefors Test Statistic	0.41			**Lilliefors GOF Test**			
566					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level			
567	**Data Not Normal at 5% Significance Level**											

	A	B	C	D	E	F	G	H	I	J	K	L
568												
569	**Assuming Normal Distribution**											
570	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
571	95% Student's-t UCL					508.3	95% Adjusted-CLT UCL (Chen-1995)					574
572							95% Modified-t UCL (Johnson-1978)					520.9
573												
574	**Gamma GOF Test**											
575	A-D Test Statistic					1.6	**Anderson-Darling Gamma GOF Test**					
576	5% A-D Critical Value					0.72	ata Not Gamma Distributed at 5% Significance Lev					
577	K-S Test Statistic					0.35	**Kolmogrov-Smirnoff Gamma GOF Test**					
578	5% K-S Critical Value					0.26	ata Not Gamma Distributed at 5% Significance Lev					
579	**Data Not Gamma Distributed at 5% Significance Level**											
580												
581	**Gamma Statistics**											
582	k hat (MLE)					4.21	k star (bias corrected MLE)					3.02
583	Theta hat (MLE)					85.8	Theta star (bias corrected MLE)					119.9
584	nu hat (MLE)					84.3	nu star (bias corrected)					60.3
585	MLE Mean (bias corrected)					362	MLE Sd (bias corrected)					208.3
586							Approximate Chi Square Value (0.05)					43.5
587	Adjusted Level of Significance					0.026	Adjusted Chi Square Value					41.0
588												
589	**Assuming Gamma Distribution**											
590	oximate Gamma UCL (use when n>=50))					502.3	Adjusted Gamma UCL (use when n<50)					532.7
591												
592	**Lognormal GOF Test**											
593	Shapiro Wilk Test Statistic					0.70	**Shapiro Wilk Lognormal GOF Test**					
594	5% Shapiro Wilk Critical Value					0.84	Data Not Lognormal at 5% Significance Level					
595	Lilliefors Test Statistic					0.31	**Lilliefors Lognormal GOF Test**					
596	5% Lilliefors Critical Value					0.28	Data Not Lognormal at 5% Significance Level					
597	**Data Not Lognormal at 5% Significance Level**											
598												
599	**Lognormal Statistics**											
600	Minimum of Logged Data					5.28	Mean of logged Data					5.76
601	Maximum of Logged Data					6.97	SD of logged Data					0.45
602												
603	**Assuming Lognormal Distribution**											
604	95% H-UCL					491.3	90% Chebyshev (MVUE) UCL					503.9
605	95% Chebyshev (MVUE) UCL					573.3	97.5% Chebyshev (MVUE) UCL					669.6
606	99% Chebyshev (MVUE) UCL					858.7						
607												
608	**Nonparametric Distribution Free UCL Statistics**											
609	**Data do not follow a Discernible Distribution (0.05)**											
610												
611	**Nonparametric Distribution Free UCLs**											
612	95% CLT UCL					493.3	95% Jackknife UCL					508.3
613	95% Standard Bootstrap UCL					488.6	95% Bootstrap-t UCL					998.1
614	95% Hall's Bootstrap UCL					1198	95% Percentile Bootstrap UCL					516.7
615	95% BCA Bootstrap UCL					539.1						
616	90% Chebyshev(Mean, Sd) UCL					601.4	95% Chebyshev(Mean, Sd) UCL					709.9
617	97.5% Chebyshev(Mean, Sd) UCL					860.4	99% Chebyshev(Mean, Sd) UCL					1156
618												
619	**Suggested UCL to Use**											
620	95% Student's-t UCL					508.3	or 95% Modified-t UCL					520.9
621												
622	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
623	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
624	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
625	For additional insight the user may want to consult a statistician.											
626												
627												
628	**Nickel**											
629												
630	**General Statistics**											

631	Total Number of Observations					10	Number of Distinct Observations					10
632							Number of Missing Observations					0
633	Minimum					5.73	Mean					7.03
634	Maximum					10.2	Median					6.54
635	SD					1.32	Std. Error of Mean					0.41
636	Coefficient of Variation					0.18	Skewness					1.66
637												
638	**Normal GOF Test**											
639	Shapiro Wilk Test Statistic					0.83	**Shapiro Wilk GOF Test**					
640	5% Shapiro Wilk Critical Value					0.84	Data Not Normal at 5% Significance Level					
641	Lilliefors Test Statistic					0.22	**Lilliefors GOF Test**					
642	5% Lilliefors Critical Value					0.28	Data appear Normal at 5% Significance Level					
643	**Data appear Approximate Normal at 5% Significance Level**											
644												
645	**Assuming Normal Distribution**											
646	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
647	95% Student's-t UCL					7.80	95% Adjusted-CLT UCL (Chen-1995)					7.96
648							95% Modified-t UCL (Johnson-1978)					7.84
649												
650	**Gamma GOF Test**											
651	A-D Test Statistic					0.54	**Anderson-Darling Gamma GOF Test**					
652	5% A-D Critical Value					0.72	d data appear Gamma Distributed at 5% Significar					
653	K-S Test Statistic					0.22	**Kolmogrov-Smirnoff Gamma GOF Test**					
654	5% K-S Critical Value					0.26	d data appear Gamma Distributed at 5% Significar					
655	**Detected data appear Gamma Distributed at 5% Significance Level**											
656												
657	**Gamma Statistics**											
658	k hat (MLE)					35.66	k star (bias corrected MLE)					25.0
659	Theta hat (MLE)					0.19	Theta star (bias corrected MLE)					0.28
660	nu hat (MLE)					713.3	nu star (bias corrected)					500.6
661	MLE Mean (bias corrected)					7.03	MLE Sd (bias corrected)					1.40
662							Approximate Chi Square Value (0.05)					449.7
663	Adjusted Level of Significance					0.026	Adjusted Chi Square Value					441.3
664												
665	**Assuming Gamma Distribution**											
666	oximate Gamma UCL (use when n>=50))					7.83	s Adjusted Gamma UCL (use when n<50)					7.98
667												
668	**Lognormal GOF Test**											
669	Shapiro Wilk Test Statistic					0.88	**Shapiro Wilk Lognormal GOF Test**					
670	5% Shapiro Wilk Critical Value					0.84	Data appear Lognormal at 5% Significance Level					
671	Lilliefors Test Statistic					0.21	**Lilliefors Lognormal GOF Test**					
672	5% Lilliefors Critical Value					0.28	Data appear Lognormal at 5% Significance Level					
673	**Data appear Lognormal at 5% Significance Level**											
674												
675	**Lognormal Statistics**											
676	Minimum of Logged Data					1.74	Mean of logged Data					1.93
677	Maximum of Logged Data					2.32	SD of logged Data					0.17
678												
679	**Assuming Lognormal Distribution**											
680	95% H-UCL					7.83	90% Chebyshev (MVUE) UCL					8.17
681	95% Chebyshev (MVUE) UCL					8.69	97.5% Chebyshev (MVUE) UCL					9.42
682	99% Chebyshev (MVUE) UCL					10.8						
683												
684	**Nonparametric Distribution Free UCL Statistics**											
685	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
686												
687	**Nonparametric Distribution Free UCLs**											
688	95% CLT UCL					7.72	95% Jackknife UCL					7.80
689	95% Standard Bootstrap UCL					7.66	95% Bootstrap-t UCL					8.28
690	95% Hall's Bootstrap UCL					9.99	95% Percentile Bootstrap UCL					7.73
691	95% BCA Bootstrap UCL					7.90						
692	90% Chebyshev(Mean, Sd) UCL					8.29	95% Chebyshev(Mean, Sd) UCL					8.86
693	97.5% Chebyshev(Mean, Sd) UCL					9.65	99% Chebyshev(Mean, Sd) UCL					11.2

694												
695						**Suggested UCL to Use**							
696						95% Student's-t UCL	7.80						
697													
698	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri												
699	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and												
700	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets												
701	For additional insight the user may want to consult a statistician.												
702													
703													
704	**Uranium**												
705													
706						**General Statistics**							
707						Total Number of Observations	10					Number of Distinct Observations	10
708												Number of Missing Observations	0
709						Minimum	0.70					Mean	1.31
710						Maximum	3.13					Median	0.97
711						SD	0.84					Std. Error of Mean	0.26
712						Coefficient of Variation	0.64					Skewness	1.62
713													
714						**Normal GOF Test**							
715						Shapiro Wilk Test Statistic	0.73					**Shapiro Wilk GOF Test**	
716						5% Shapiro Wilk Critical Value	0.84					Data Not Normal at 5% Significance Level	
717						Lilliefors Test Statistic	0.27					**Lilliefors GOF Test**	
718						5% Lilliefors Critical Value	0.28					Data appear Normal at 5% Significance Level	
719						**Data appear Approximate Normal at 5% Significance Level**							
720													
721						**Assuming Normal Distribution**							
722						**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**	
723						95% Student's-t UCL	1.80					95% Adjusted-CLT UCL (Chen-1995)	1.9
724												95% Modified-t UCL (Johnson-1978)	1.82
725													
726						**Gamma GOF Test**							
727						A-D Test Statistic	0.90					**Anderson-Darling Gamma GOF Test**	
728						5% A-D Critical Value	0.73	ata Not Gamma Distributed at 5% Significance Lev					
729						K-S Test Statistic	0.24	**Kolmogrov-Smirnoff Gamma GOF Test**					
730						5% K-S Critical Value	0.26	d data appear Gamma Distributed at 5% Significan					
731						**Detected data follow Appr. Gamma Distribution at 5% Significance Level**							
732													
733						**Gamma Statistics**							
734						k hat (MLE)	3.65					k star (bias corrected MLE)	2.62
735						Theta hat (MLE)	0.36					Theta star (bias corrected MLE)	0.50
736						nu hat (MLE)	73.12					nu star (bias corrected)	52.52
737						MLE Mean (bias corrected)	1.31					MLE Sd (bias corrected)	0.81
738												Approximate Chi Square Value (0.05)	36.8
739						Adjusted Level of Significance	0.026					Adjusted Chi Square Value	34.6
740													
741						**Assuming Gamma Distribution**							
742	oximate Gamma UCL (use when n>=50))						1.87	Adjusted Gamma UCL (use when n<50)					1.99
743													
744						**Lognormal GOF Test**							
745						Shapiro Wilk Test Statistic	0.83					**Shapiro Wilk Lognormal GOF Test**	
746						5% Shapiro Wilk Critical Value	0.84	Data Not Lognormal at 5% Significance Level					
747						Lilliefors Test Statistic	0.23	**Lilliefors Lognormal GOF Test**					
748						5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level					
749						**Data appear Approximate Lognormal at 5% Significance Level**							
750													
751						**Lognormal Statistics**							
752						Minimum of Logged Data	-0.354					Mean of logged Data	0.13
753						Maximum of Logged Data	1.14					SD of logged Data	0.52
754													
755						**Assuming Lognormal Distribution**							
756						95% H-UCL	1.95					90% Chebyshev (MVUE) UCL	1.95

757			95% Chebyshev (MVUE) UCL		2.24			97.5% Chebyshev (MVUE) UCL				2.66
758			99% Chebyshev (MVUE) UCL		3.47							
759												
760					**Nonparametric Distribution Free UCL Statistics**							
761					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
762												
763					**Nonparametric Distribution Free UCLs**							
764			95% CLT UCL		1.75			95% Jackknife UCL				1.80
765			95% Standard Bootstrap UCL		1.73			95% Bootstrap-t UCL				2.66
766			95% Hall's Bootstrap UCL		4.30			95% Percentile Bootstrap UCL				1.78
767			95% BCA Bootstrap UCL		1.87							
768			90% Chebyshev(Mean, Sd) UCL		2.11			95% Chebyshev(Mean, Sd) UCL				2.47
769			97.5% Chebyshev(Mean, Sd) UCL		2.98			99% Chebyshev(Mean, Sd) UCL				3.96
770												
771					**Suggested UCL to Use**							
772			95% Student's-t UCL		1.80							
773												
774	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
775	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
776	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
777	For additional insight the user may want to consult a statistician.											
778												
779												
780	**Vanadium**											
781												
782					**General Statistics**							
783			Total Number of Observations		10			Number of Distinct Observations				9
784								Number of Missing Observations				0
785			Minimum		18.8			Mean				25.9
786			Maximum		30.8			Median				26.2
787			SD		3.82			Std. Error of Mean				1.20
788			Coefficient of Variation		0.14			Skewness				-0.63
789												
790					**Normal GOF Test**							
791			Shapiro Wilk Test Statistic		0.95			**Shapiro Wilk GOF Test**				
792			5% Shapiro Wilk Critical Value		0.84			Data appear Normal at 5% Significance Level				
793			Lilliefors Test Statistic		0.14			**Lilliefors GOF Test**				
794			5% Lilliefors Critical Value		0.28			Data appear Normal at 5% Significance Level				
795					**Data appear Normal at 5% Significance Level**							
796												
797					**Assuming Normal Distribution**							
798					**95% Normal UCL**							**95% UCLs (Adjusted for Skewness)**
799			95% Student's-t UCL		28.2			95% Adjusted-CLT UCL (Chen-1995)				27.7
800								95% Modified-t UCL (Johnson-1978)				28.1
801												
802					**Gamma GOF Test**							
803			A-D Test Statistic		0.28			**Anderson-Darling Gamma GOF Test**				
804			5% A-D Critical Value		0.72			d data appear Gamma Distributed at 5% Significar				
805			K-S Test Statistic		0.16			**Kolmogrov-Smirnoff Gamma GOF Test**				
806			5% K-S Critical Value		0.26			d data appear Gamma Distributed at 5% Significar				
807					**Detected data appear Gamma Distributed at 5% Significance Level**							
808												
809					**Gamma Statistics**							
810			k hat (MLE)		47.9			k star (bias corrected MLE)				33.6
811			Theta hat (MLE)		0.54			Theta star (bias corrected MLE)				0.77
812			nu hat (MLE)		958.4			nu star (bias corrected)				672.2
813			MLE Mean (bias corrected)		25.9			MLE Sd (bias corrected)				4.48
814								Approximate Chi Square Value (0.05)				613.1
815			Adjusted Level of Significance		0.026			Adjusted Chi Square Value				603.2
816												
817					**Assuming Gamma Distribution**							
818	oximate Gamma UCL (use when n>=50))				28.5			Adjusted Gamma UCL (use when n<50)				28.9
819												

	A	B	C	D	E	F	G	H	I	J	K	L
820	**Lognormal GOF Test**											
821					Shapiro Wilk Test Statistic	0.93	**Shapiro Wilk Lognormal GOF Test**					
822					5% Shapiro Wilk Critical Value	0.84	Data appear Lognormal at 5% Significance Level					
823					Lilliefors Test Statistic	0.17	**Lilliefors Lognormal GOF Test**					
824					5% Lilliefors Critical Value	0.28	Data appear Lognormal at 5% Significance Level					
825	**Data appear Lognormal at 5% Significance Level**											
826												
827	**Lognormal Statistics**											
828					Minimum of Logged Data	2.93			Mean of logged Data			3.24
829					Maximum of Logged Data	3.42			SD of logged Data			0.15
830												
831	**Assuming Lognormal Distribution**											
832					95% H-UCL	28.64			90% Chebyshev (MVUE) UCL			29.8
833					95% Chebyshev (MVUE) UCL	31.59			97.5% Chebyshev (MVUE) UCL			34
834					99% Chebyshev (MVUE) UCL	38.75						
835												
836	**Nonparametric Distribution Free UCL Statistics**											
837	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
838												
839	**Nonparametric Distribution Free UCLs**											
840					95% CLT UCL	27.98			95% Jackknife UCL			28.2
841					95% Standard Bootstrap UCL	27.86			95% Bootstrap-t UCL			27.95
842					95% Hall's Bootstrap UCL	27.7			95% Percentile Bootstrap UCL			27.86
843					95% BCA Bootstrap UCL	27.67						
844					90% Chebyshev(Mean, Sd) UCL	29.62			95% Chebyshev(Mean, Sd) UCL			31.2
845					97.5% Chebyshev(Mean, Sd) UCL	33.54			99% Chebyshev(Mean, Sd) UCL			38.0
846												
847	**Suggested UCL to Use**											
848					95% Student's-t UCL	28.2						
849												
850	stions regarding the selection of a 95% UCL are provided to help the user to select the most appropri											
851	ommendations are based upon the results of the simulation studies summarized in Singh, Singh, and											
852	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets											
853	For additional insight the user may want to consult a statistician.											
854												
855	**highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may**											
856	**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**											
857												