	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			3/1/2015 12:56:25 PM								
5	From File			EPC_026SurfR1_EU03.xls								
6	Full Precision			OFF								
7	Confidence Coefficient			95%								
8	Number of Bootstrap Operations			2000								
9												
10												
11	Arsenic											
12												
13	General Statistics											
14	Total Number of Observations					10	Number of Distinct Observations					4
15							Number of Missing Observations					0
16	Minimum					4.66	Mean					23.09
17	Maximum					130.4	Median					10
18	SD					38.08	Std. Error of Mean					12.04
19	Coefficient of Variation					1.65	Skewness					3.049
20												
21	Normal GOF Test											
22	Shapiro Wilk Test Statistic					0.458	Shapiro Wilk GOF Test					
23	5% Shapiro Wilk Critical Value					0.842	Data Not Normal at 5% Significance Level					
24	Lilliefors Test Statistic					0.434	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					45.16	95% Adjusted-CLT UCL (Chen-1995)					55.3
31							95% Modified-t UCL (Johnson-1978)					47.1
32												
33	Gamma GOF Test											
34	A-D Test Statistic					2.085	Anderson-Darling Gamma GOF Test					
35	5% A-D Critical Value					0.748	Data Not Gamma Distributed at 5% Significance Level					
36	K-S Test Statistic					0.453	Kolmogrov-Smirnoff Gamma GOF Test					
37	5% K-S Critical Value					0.274	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)					1.025	k star (bias corrected MLE)					0.784
42	Theta hat (MLE)					22.51	Theta star (bias corrected MLE)					29.43
43	nu hat (MLE)					20.51	nu star (bias corrected)					15.69
44	MLE Mean (bias corrected)					23.09	MLE Sd (bias corrected)					26.07
45							Approximate Chi Square Value (0.05)					7.743
46	Adjusted Level of Significance					0.0267	Adjusted Chi Square Value					6.795
47												
48	Assuming Gamma Distribution											
49	95% Approximate Gamma UCL (use when n>=50))					46.78	95% Adjusted Gamma UCL (use when n<50)					53.3
50												
51	Lognormal GOF Test											
52	Shapiro Wilk Test Statistic					0.676	Shapiro Wilk Lognormal GOF Test					

	A	B	C	D	E	F	G	H	I	J	K	L
53					5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level					
54					Lilliefors Test Statistic	0.42	**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	1.539	Mean of logged Data					2.578
60					Maximum of Logged Data	4.87	SD of logged Data					0.902
61												
62	**Assuming Lognormal Distribution**											
63					95% H-UCL	47.37	90% Chebyshev (MVUE) UCL					35.54
64					95% Chebyshev (MVUE) UCL	43.13	97.5% Chebyshev (MVUE) UCL					53.67
65					99% Chebyshev (MVUE) UCL	74.37						
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	42.9	95% Jackknife UCL					45.16
72					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
73					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
74					95% BCA Bootstrap UCL	N/A						
75					90% Chebyshev(Mean, Sd) UCL	59.22	95% Chebyshev(Mean, Sd) UCL					75.58
76					97.5% Chebyshev(Mean, Sd) UCL	98.3	99% Chebyshev(Mean, Sd) UCL					142.9
77												
78	**Suggested UCL to Use**											
79					95% Chebyshev (Mean, Sd) UCL	75.58						
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												
87	**Cesium-137**											
88												
89	**General Statistics**											
90					Total Number of Observations	10	Number of Distinct Observations					3
91							Number of Missing Observations					0
92					Minimum	0.2	Mean					2.815
93					Maximum	5.43	Median					2.815
94					SD	1.233	Std. Error of Mean					0.39
95					Coefficient of Variation	0.438	Skewness					-1.32E-15
96												
97	**Normal GOF Test**											
98					Shapiro Wilk Test Statistic	0.659	**Shapiro Wilk GOF Test**					
99					5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level					
100					Lilliefors Test Statistic	0.4	**Lilliefors GOF Test**					
101					5% Lilliefors Critical Value	0.28	Data Not Normal at 5% Significance Level					
102	**Data Not Normal at 5% Significance Level**											
103												
104	**Assuming Normal Distribution**											

	A	B	C	D	E	F	G	H	I	J	K	L
105	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
106					95% Student's-t UCL	3.53				95% Adjusted-CLT UCL (Chen-1995)		3.456
107										95% Modified-t UCL (Johnson-1978)		3.53
108												
109	Gamma GOF Test											
110					A-D Test Statistic	2.319	Anderson-Darling Gamma GOF Test					
111					5% A-D Critical Value	0.733	Data Not Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.481	Kolmogrov-Smirnoff Gamma GOF Test					
113					5% K-S Critical Value	0.269	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)	2.671				k star (bias corrected MLE)		1.936
118					Theta hat (MLE)	1.054				Theta star (bias corrected MLE)		1.454
119					nu hat (MLE)	53.41				nu star (bias corrected)		38.72
120					MLE Mean (bias corrected)	2.815				MLE Sd (bias corrected)		2.023
121										Approximate Chi Square Value (0.05)		25.47
122					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		23.62
123												
124	Assuming Gamma Distribution											
125					95% Approximate Gamma UCL (use when n>=50))	4.28				95% Adjusted Gamma UCL (use when n<50)		4.616
126												
127	Lognormal GOF Test											
128					Shapiro Wilk Test Statistic	0.511	Shapiro Wilk Lognormal GOF Test					
129					5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.489	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	-1.609				Mean of logged Data		0.836
136					Maximum of Logged Data	1.692				SD of logged Data		0.884
137												
138	Assuming Lognormal Distribution											
139					95% H-UCL	7.942				90% Chebyshev (MVUE) UCL		6.082
140					95% Chebyshev (MVUE) UCL	7.367				97.5% Chebyshev (MVUE) UCL		9.15
141					99% Chebyshev (MVUE) UCL	12.65						
142												
143	Nonparametric Distribution Free UCL Statistics											
144	Data do not follow a Discernible Distribution (0.05)											
145												
146	Nonparametric Distribution Free UCLs											
147					95% CLT UCL	3.456				95% Jackknife UCL		3.53
148					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
149					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
150					95% BCA Bootstrap UCL	N/A						
151					90% Chebyshev(Mean, Sd) UCL	3.984				95% Chebyshev(Mean, Sd) UCL		4.514
152					97.5% Chebyshev(Mean, Sd) UCL	5.249				99% Chebyshev(Mean, Sd) UCL		6.694
153												
154	Suggested UCL to Use											
155					95% Chebyshev (Mean, Sd) UCL	4.514						
156												

	A	B	C	D	E	F	G	H	I	J	K	L
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												
166	**Chromium**											
167												
168	**General Statistics**											
169	Total Number of Observations					10	Number of Distinct Observations					4
170							Number of Missing Observations					0
171	Minimum					12	Mean					20.24
172	Maximum					66.62	Median					12
173	SD					18.37	Std. Error of Mean					5.809
174	Coefficient of Variation					0.908	Skewness					2.287
175												
176	**Normal GOF Test**											
177	Shapiro Wilk Test Statistic					0.537	**Shapiro Wilk GOF Test**					
178	5% Shapiro Wilk Critical Value					0.842	Data Not Normal at 5% Significance Level					
179	Lilliefors Test Statistic					0.459	**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					30.89	95% Adjusted-CLT UCL (Chen-1995)					34.28
186							95% Modified-t UCL (Johnson-1978)					31.59
187												
188	**Gamma GOF Test**											
189	A-D Test Statistic					2.382	**Anderson-Darling Gamma GOF Test**					
190	5% A-D Critical Value					0.734	Data Not Gamma Distributed at 5% Significance Level					
191	K-S Test Statistic					0.469	**Kolmogrov-Smirnoff Gamma GOF Test**					
192	5% K-S Critical Value					0.269	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)					2.35	k star (bias corrected MLE)					1.712
197	Theta hat (MLE)					8.61	Theta star (bias corrected MLE)					11.82
198	nu hat (MLE)					47.01	nu star (bias corrected)					34.24
199	MLE Mean (bias corrected)					20.24	MLE Sd (bias corrected)					15.47
200							Approximate Chi Square Value (0.05)					21.86
201	Adjusted Level of Significance					0.0267	Adjusted Chi Square Value					20.15
202												
203	**Assuming Gamma Distribution**											
204	95% Approximate Gamma UCL (use when n>=50))					31.7	95% Adjusted Gamma UCL (use when n<50)					34.39
205												
206	**Lognormal GOF Test**											
207	Shapiro Wilk Test Statistic					0.553	**Shapiro Wilk Lognormal GOF Test**					
208	5% Shapiro Wilk Critical Value					0.842	Data Not Lognormal at 5% Significance Level					

	A	B	C	D	E	F	G	H	I	J	K	L
209					Lilliefors Test Statistic	0.45	**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	2.485				Mean of logged Data		2.78
215					Maximum of Logged Data	4.199				SD of logged Data		0.62
216												
217	**Assuming Lognormal Distribution**											
218					95% H-UCL	32.09				90% Chebyshev (MVUE) UCL		30.66
219					95% Chebyshev (MVUE) UCL	35.88				97.5% Chebyshev (MVUE) UCL		43.14
220					99% Chebyshev (MVUE) UCL	57.39						
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	29.79				95% Jackknife UCL		30.89
227					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
228					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
229					95% BCA Bootstrap UCL	N/A						
230					90% Chebyshev(Mean, Sd) UCL	37.67				95% Chebyshev(Mean, Sd) UCL		45.56
231					97.5% Chebyshev(Mean, Sd) UCL	56.52				99% Chebyshev(Mean, Sd) UCL		78.04
232												
233	**Suggested UCL to Use**											
234					95% Chebyshev (Mean, Sd) UCL	45.56						
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												
242	**Iron**											
243												
244	**General Statistics**											
245					Total Number of Observations	10				Number of Distinct Observations		10
246										Number of Missing Observations		0
247					Minimum	22920				Mean		30178
248					Maximum	44804				Median		25712
249					SD	7665				Std. Error of Mean		2424
250					Coefficient of Variation	0.254				Skewness		0.901
251												
252	**Normal GOF Test**											
253					Shapiro Wilk Test Statistic	0.84	**Shapiro Wilk GOF Test**					
254					5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level					
255					Lilliefors Test Statistic	0.312	**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)**					

	A	B	C	D	E	F	G	H	I	J	K	L
261					95% Student's-t UCL	34622				95% Adjusted-CLT UCL (Chen-1995)		34903
262										95% Modified-t UCL (Johnson-1978)		34737
263												
264					Gamma GOF Test							
265					A-D Test Statistic	0.779			Anderson-Darling Gamma GOF Test			
266					5% A-D Critical Value	0.725			Data Not Gamma Distributed at 5% Significance Level			
267					K-S Test Statistic	0.316			Kolmogrov-Smirnoff Gamma GOF Test			
268					5% K-S Critical Value	0.266			Data Not Gamma Distributed at 5% Significance Level			
269					Data Not Gamma Distributed at 5% Significance Level							
270												
271					Gamma Statistics							
272					k hat (MLE)	18.74			k star (bias corrected MLE)			13.18
273					Theta hat (MLE)	1610			Theta star (bias corrected MLE)			2289
274					nu hat (MLE)	374.8			nu star (bias corrected)			263.7
275					MLE Mean (bias corrected)	30178			MLE Sd (bias corrected)			8311
276									Approximate Chi Square Value (0.05)			227.1
277					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value			221.2
278												
279					Assuming Gamma Distribution							
280					95% Approximate Gamma UCL (use when n>=50))	35042			95% Adjusted Gamma UCL (use when n<50)			35978
281												
282					Lognormal GOF Test							
283					Shapiro Wilk Test Statistic	0.856			Shapiro Wilk Lognormal GOF Test			
284					5% Shapiro Wilk Critical Value	0.842			Data appear Lognormal at 5% Significance Level			
285					Lilliefors Test Statistic	0.301			Lilliefors Lognormal GOF Test			
286					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
287					Data appear Approximate Lognormal at 5% Significance Level							
288												
289					Lognormal Statistics							
290					Minimum of Logged Data	10.04			Mean of logged Data			10.29
291					Maximum of Logged Data	10.71			SD of logged Data			0.24
292												
293					Assuming Lognormal Distribution							
294					95% H-UCL	35245			90% Chebyshev (MVUE) UCL			37039
295					95% Chebyshev (MVUE) UCL	40162			97.5% Chebyshev (MVUE) UCL			44496
296					99% Chebyshev (MVUE) UCL	53009						
297												
298					Nonparametric Distribution Free UCL Statistics							
299					Data appear to follow a Discernible Distribution at 5% Significance Level							
300												
301					Nonparametric Distribution Free UCLs							
302					95% CLT UCL	34165			95% Jackknife UCL			34622
303					95% Standard Bootstrap UCL	33918			95% Bootstrap-t UCL			36337
304					95% Hall's Bootstrap UCL	34100			95% Percentile Bootstrap UCL			34136
305					95% BCA Bootstrap UCL	34579						
306					90% Chebyshev(Mean, Sd) UCL	37450			95% Chebyshev(Mean, Sd) UCL			40744
307					97.5% Chebyshev(Mean, Sd) UCL	45316			99% Chebyshev(Mean, Sd) UCL			54297
308												
309					Suggested UCL to Use							
310					95% Student's-t UCL	34622				or 95% Modified-t UCL		34737
311												
312	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											

	A	B	C	D	E	F	G	H	I	J	K	L
313	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
314	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
315	For additional insight the user may want to consult a statistician.											
316												
317												
318	**Molybdenum**											
319												
320	**General Statistics**											
321					Total Number of Observations	10			Number of Distinct Observations		4	
322									Number of Missing Observations		0	
323					Minimum	1.8			Mean		12.48	
324					Maximum	57			Median		3	
325					SD	20.5			Std. Error of Mean		6.483	
326					Coefficient of Variation	1.643			Skewness		1.861	
327												
328	**Normal GOF Test**											
329					Shapiro Wilk Test Statistic	0.547			**Shapiro Wilk GOF Test**			
330					5% Shapiro Wilk Critical Value	0.842			Data Not Normal at 5% Significance Level			
331					Lilliefors Test Statistic	0.478			**Lilliefors GOF Test**			
332					5% Lilliefors Critical Value	0.28			Data Not Normal at 5% Significance Level			
333	**Data Not Normal at 5% Significance Level**											
334												
335	**Assuming Normal Distribution**											
336					**95% Normal UCL**				**95% UCLs (Adjusted for Skewness)**			
337					95% Student's-t UCL	24.36			95% Adjusted-CLT UCL (Chen-1995)		27.22	
338									95% Modified-t UCL (Johnson-1978)		25	
339												
340	**Gamma GOF Test**											
341					A-D Test Statistic	2.33			**Anderson-Darling Gamma GOF Test**			
342					5% A-D Critical Value	0.764			Data Not Gamma Distributed at 5% Significance Level			
343					K-S Test Statistic	0.493			**Kolmogrov-Smirnoff Gamma GOF Test**			
344					5% K-S Critical Value	0.278			Data Not Gamma Distributed at 5% Significance Level			
345	**Data Not Gamma Distributed at 5% Significance Level**											
346												
347	**Gamma Statistics**											
348					k hat (MLE)	0.668			k star (bias corrected MLE)		0.534	
349					Theta hat (MLE)	18.69			Theta star (bias corrected MLE)		23.37	
350					nu hat (MLE)	13.35			nu star (bias corrected)		10.68	
351					MLE Mean (bias corrected)	12.48			MLE Sd (bias corrected)		17.08	
352									Approximate Chi Square Value (0.05)		4.371	
353					Adjusted Level of Significance	0.0267			Adjusted Chi Square Value		3.696	
354												
355	**Assuming Gamma Distribution**											
356					95% Approximate Gamma UCL (use when n>=50))	30.49			95% Adjusted Gamma UCL (use when n<50)		36.06	
357												
358	**Lognormal GOF Test**											
359					Shapiro Wilk Test Statistic	0.607			**Shapiro Wilk Lognormal GOF Test**			
360					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level			
361					Lilliefors Test Statistic	0.462			**Lilliefors Lognormal GOF Test**			
362					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
363	**Data Not Lognormal at 5% Significance Level**											
364												

	A	B	C	D	E	F	G	H	I	J	K	L
365						Lognormal Statistics						
366					Minimum of Logged Data	0.588					Mean of logged Data	1.613
367					Maximum of Logged Data	4.043					SD of logged Data	1.23
368												
369						Assuming Lognormal Distribution						
370					95% H-UCL	46.69					90% Chebyshev (MVUE) UCL	21.33
371					95% Chebyshev (MVUE) UCL	26.66					97.5% Chebyshev (MVUE) UCL	34.06
372					99% Chebyshev (MVUE) UCL	48.6						
373												
374						Nonparametric Distribution Free UCL Statistics						
375						Data do not follow a Discernible Distribution (0.05)						
376												
377						Nonparametric Distribution Free UCLs						
378					95% CLT UCL	23.14					95% Jackknife UCL	24.36
379					95% Standard Bootstrap UCL	N/A					95% Bootstrap-t UCL	N/A
380					95% Hall's Bootstrap UCL	N/A					95% Percentile Bootstrap UCL	N/A
381					95% BCA Bootstrap UCL	N/A						
382					90% Chebyshev(Mean, Sd) UCL	31.93					95% Chebyshev(Mean, Sd) UCL	40.74
383					97.5% Chebyshev(Mean, Sd) UCL	52.97					99% Chebyshev(Mean, Sd) UCL	76.99
384												
385						Suggested UCL to Use						
386					95% Chebyshev (Mean, Sd) UCL	40.74						
387												
388					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
389					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
390					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
391					For additional insight the user may want to consult a statistician.							
392												
393												
394	Neptunium-237											
395												
396						General Statistics						
397					Total Number of Observations	10					Number of Distinct Observations	3
398											Number of Missing Observations	0
399					Minimum	0.1					Mean	0.312
400					Maximum	0.524					Median	0.312
401					SD	0.0999					Std. Error of Mean	0.0316
402					Coefficient of Variation	0.32					Skewness	2.655E-15
403												
404						Normal GOF Test						
405					Shapiro Wilk Test Statistic	0.659					Shapiro Wilk GOF Test	
406					5% Shapiro Wilk Critical Value	0.842					Data Not Normal at 5% Significance Level	
407					Lilliefors Test Statistic	0.4					Lilliefors GOF Test	
408					5% Lilliefors Critical Value	0.28					Data Not Normal at 5% Significance Level	
409						Data Not Normal at 5% Significance Level						
410												
411						Assuming Normal Distribution						
412					95% Normal UCL						95% UCLs (Adjusted for Skewness)	
413					95% Student's-t UCL	0.37					95% Adjusted-CLT UCL (Chen-1995)	0.364
414											95% Modified-t UCL (Johnson-1978)	0.37
415												
416						Gamma GOF Test						

417					A-D Test Statistic	2.11	Anderson-Darling Gamma GOF Test					
418					5% A-D Critical Value	0.727	Data Not Gamma Distributed at 5% Significance Level					
419					K-S Test Statistic	0.446	Kolmogrov-Smirnoff Gamma GOF Test					
420					5% K-S Critical Value	0.267	Data Not Gamma Distributed at 5% Significance Level					
421	Data Not Gamma Distributed at 5% Significance Level											
422												
423	Gamma Statistics											
424					k hat (MLE)	8.236	k star (bias corrected MLE)					5.832
425					Theta hat (MLE)	0.0379	Theta star (bias corrected MLE)					0.0535
426					nu hat (MLE)	164.7	nu star (bias corrected)					116.6
427					MLE Mean (bias corrected)	0.312	MLE Sd (bias corrected)					0.129
428							Approximate Chi Square Value (0.05)					92.7
429					Adjusted Level of Significance	0.0267	Adjusted Chi Square Value					89
430												
431	Assuming Gamma Distribution											
432					95% Approximate Gamma UCL (use when n>=50))	0.393	95% Adjusted Gamma UCL (use when n<50)					0.409
433												
434	Lognormal GOF Test											
435					Shapiro Wilk Test Statistic	0.592	Shapiro Wilk Lognormal GOF Test					
436					5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level					
437					Lilliefors Test Statistic	0.46	Lilliefors Lognormal GOF Test					
438					5% Lilliefors Critical Value	0.28	Data Not Lognormal at 5% Significance Level					
439	Data Not Lognormal at 5% Significance Level											
440												
441	Lognormal Statistics											
442					Minimum of Logged Data	-2.303	Mean of logged Data					-1.227
443					Maximum of Logged Data	-0.646	SD of logged Data					0.412
444												
445	Assuming Lognormal Distribution											
446					95% H-UCL	0.426	90% Chebyshev (MVUE) UCL					0.441
447					95% Chebyshev (MVUE) UCL	0.498	97.5% Chebyshev (MVUE) UCL					0.577
448					99% Chebyshev (MVUE) UCL	0.731						
449												
450	Nonparametric Distribution Free UCL Statistics											
451	Data do not follow a Discernible Distribution (0.05)											
452												
453	Nonparametric Distribution Free UCLs											
454					95% CLT UCL	0.364	95% Jackknife UCL					0.37
455					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL					N/A
456					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL					N/A
457					95% BCA Bootstrap UCL	N/A						
458					90% Chebyshev(Mean, Sd) UCL	0.407	95% Chebyshev(Mean, Sd) UCL					0.45
459					97.5% Chebyshev(Mean, Sd) UCL	0.509	99% Chebyshev(Mean, Sd) UCL					0.626
460												
461	Suggested UCL to Use											
462					95% Student's-t UCL	0.37	or 95% Modified-t UCL					0.37
463												
464	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
465	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
466	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
467	For additional insight the user may want to consult a statistician.											
468												

	A	B	C	D	E	F	G	H	I	J	K	L
469												
470	PAH, Total											
471												
472						General Statistics						
473					Total Number of Observations	10				Number of Distinct Observations		3
474										Number of Missing Observations		0
475					Minimum	0.283				Mean		0.32
476					Maximum	0.357				Median		0.32
477					SD	0.0175				Std. Error of Mean		0.00553
478					Coefficient of Variation	0.0547				Skewness		0
479												
480						Normal GOF Test						
481					Shapiro Wilk Test Statistic	0.659				Shapiro Wilk GOF Test		
482					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
483					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
484					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
485						Data Not Normal at 5% Significance Level						
486												
487						Assuming Normal Distribution						
488					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
489					95% Student's-t UCL	0.33				95% Adjusted-CLT UCL (Chen-1995)		0.329
490										95% Modified-t UCL (Johnson-1978)		0.33
491												
492						Gamma GOF Test						
493					A-D Test Statistic	2.015				Anderson-Darling Gamma GOF Test		
494					5% A-D Critical Value	0.724				Data Not Gamma Distributed at 5% Significance Level		
495					K-S Test Statistic	0.407				Kolmogrov-Smirnoff Gamma GOF Test		
496					5% K-S Critical Value	0.266				Data Not Gamma Distributed at 5% Significance Level		
497						Data Not Gamma Distributed at 5% Significance Level						
498												
499						Gamma Statistics						
500					k hat (MLE)	369.7				k star (bias corrected MLE)		258.8
501					Theta hat (MLE)	8.6603E-4				Theta star (bias corrected MLE)		0.00124
502					nu hat (MLE)	7393				nu star (bias corrected)		5177
503					MLE Mean (bias corrected)	0.32				MLE Sd (bias corrected)		0.0199
504										Approximate Chi Square Value (0.05)		5010
505					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		4982
506												
507						Assuming Gamma Distribution						
508					95% Approximate Gamma UCL (use when n>=50))	0.331				95% Adjusted Gamma UCL (use when n<50)		0.333
509												
510						Lognormal GOF Test						
511					Shapiro Wilk Test Statistic	0.657				Shapiro Wilk Lognormal GOF Test		
512					5% Shapiro Wilk Critical Value	0.842				Data Not Lognormal at 5% Significance Level		
513					Lilliefors Test Statistic	0.41				Lilliefors Lognormal GOF Test		
514					5% Lilliefors Critical Value	0.28				Data Not Lognormal at 5% Significance Level		
515						Data Not Lognormal at 5% Significance Level						
516												
517						Lognormal Statistics						
518					Minimum of Logged Data	-1.262				Mean of logged Data		-1.14
519					Maximum of Logged Data	-1.029				SD of logged Data		0.055
520												

	A	B	C	D	E	F	G	H	I	J	K	L
521	Assuming Lognormal Distribution											
522					95% H-UCL	N/A				90% Chebyshev (MVUE) UCL		0.337
523					95% Chebyshev (MVUE) UCL	0.344				97.5% Chebyshev (MVUE) UCL		0.355
524					99% Chebyshev (MVUE) UCL	0.376						
525												
526	Nonparametric Distribution Free UCL Statistics											
527	Data do not follow a Discernible Distribution (0.05)											
528												
529	Nonparametric Distribution Free UCLs											
530					95% CLT UCL	0.329				95% Jackknife UCL		0.33
531					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
532					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
533					95% BCA Bootstrap UCL	N/A						
534					90% Chebyshev(Mean, Sd) UCL	0.337				95% Chebyshev(Mean, Sd) UCL		0.344
535					97.5% Chebyshev(Mean, Sd) UCL	0.355				99% Chebyshev(Mean, Sd) UCL		0.375
536												
537	Suggested UCL to Use											
538					95% Student's-t UCL	0.33				or 95% Modified-t UCL		0.33
539												
540	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
541	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
542	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
543	For additional insight the user may want to consult a statistician.											
544												
545												
546	PCB, Total											
547												
548	General Statistics											
549					Total Number of Observations	10				Number of Distinct Observations		5
550										Number of Missing Observations		0
551					Minimum	0.018				Mean		1.688
552					Maximum	5				Median		0.24
553					SD	2.295				Std. Error of Mean		0.726
554					Coefficient of Variation	1.36				Skewness		1.006
555												
556	Normal GOF Test											
557					Shapiro Wilk Test Statistic	0.652				Shapiro Wilk GOF Test		
558					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
559					Lilliefors Test Statistic	0.351				Lilliefors GOF Test		
560					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
561	Data Not Normal at 5% Significance Level											
562												
563	Assuming Normal Distribution											
564			95% Normal UCL							95% UCLs (Adjusted for Skewness)		
565					95% Student's-t UCL	3.018				95% Adjusted-CLT UCL (Chen-1995)		3.128
566										95% Modified-t UCL (Johnson-1978)		3.057
567												
568	Gamma GOF Test											
569					A-D Test Statistic	0.91				Anderson-Darling Gamma GOF Test		
570					5% A-D Critical Value	0.777				Data Not Gamma Distributed at 5% Significance Level		
571					K-S Test Statistic	0.307				Kolmogrov-Smirnoff Gamma GOF Test		
572					5% K-S Critical Value	0.281				Data Not Gamma Distributed at 5% Significance Level		

	A	B	C	D	E	F	G	H	I	J	K	L
573	**Data Not Gamma Distributed at 5% Significance Level**											
574												
575	**Gamma Statistics**											
576					k hat (MLE)	0.502				k star (bias corrected MLE)		0.418
577					Theta hat (MLE)	3.365				Theta star (bias corrected MLE)		4.04
578					nu hat (MLE)	10.03				nu star (bias corrected)		8.355
579					MLE Mean (bias corrected)	1.688				MLE Sd (bias corrected)		2.611
580										Approximate Chi Square Value (0.05)		2.943
581					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		2.413
582												
583	**Assuming Gamma Distribution**											
584				95% Approximate Gamma UCL (use when n>=50))		4.793				95% Adjusted Gamma UCL (use when n<50)		5.844
585												
586	**Lognormal GOF Test**											
587					Shapiro Wilk Test Statistic	0.885				**Shapiro Wilk Lognormal GOF Test**		
588					5% Shapiro Wilk Critical Value	0.842				Data appear Lognormal at 5% Significance Level		
589					Lilliefors Test Statistic	0.242				**Lilliefors Lognormal GOF Test**		
590					5% Lilliefors Critical Value	0.28				Data appear Lognormal at 5% Significance Level		
591	**Data appear Lognormal at 5% Significance Level**											
592												
593	**Lognormal Statistics**											
594					Minimum of Logged Data	-4.017				Mean of logged Data		-0.742
595					Maximum of Logged Data	1.609				SD of logged Data		1.883
596												
597	**Assuming Lognormal Distribution**											
598					95% H-UCL	69.26				90% Chebyshev (MVUE) UCL		5.605
599					95% Chebyshev (MVUE) UCL	7.254				97.5% Chebyshev (MVUE) UCL		9.543
600					99% Chebyshev (MVUE) UCL	14.04						
601												
602	**Nonparametric Distribution Free UCL Statistics**											
603	**Data appear to follow a Discernible Distribution at 5% Significance Level**											
604												
605	**Nonparametric Distribution Free UCLs**											
606					95% CLT UCL	2.881				95% Jackknife UCL		3.018
607					95% Standard Bootstrap UCL	2.798				95% Bootstrap-t UCL		3.21
608					95% Hall's Bootstrap UCL	2.406				95% Percentile Bootstrap UCL		2.718
609					95% BCA Bootstrap UCL	3.082						
610					90% Chebyshev(Mean, Sd) UCL	3.865				95% Chebyshev(Mean, Sd) UCL		4.851
611					97.5% Chebyshev(Mean, Sd) UCL	6.22				99% Chebyshev(Mean, Sd) UCL		8.908
612												
613	**Suggested UCL to Use**											
614					99% Chebyshev (Mean, Sd) UCL	8.908						
615												
616	**Recommended UCL exceeds the maximum observation**											
617												
618	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
619	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
620	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
621	For additional insight the user may want to consult a statistician.											
622												
623												
624	**Thallium**											

	A	B	C	D	E	F	G	H	I	J	K	L
625												
626						General Statistics						
627					Total Number of Observations	10				Number of Distinct Observations		4
628										Number of Missing Observations		0
629					Minimum	0.34				Mean		1.98
630					Maximum	5				Median		1.98
631					SD	1.234				Std. Error of Mean		0.39
632					Coefficient of Variation	0.623				Skewness		1.514
633												
634						Normal GOF Test						
635					Shapiro Wilk Test Statistic	0.714				Shapiro Wilk GOF Test		
636					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
637					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
638					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
639						Data Not Normal at 5% Significance Level						
640												
641						Assuming Normal Distribution						
642					95% Normal UCL					95% UCLs (Adjusted for Skewness)		
643					95% Student's-t UCL	2.696				95% Adjusted-CLT UCL (Chen-1995)		2.822
644										95% Modified-t UCL (Johnson-1978)		2.727
645												
646						Gamma GOF Test						
647					A-D Test Statistic	1.396				Anderson-Darling Gamma GOF Test		
648					5% A-D Critical Value	0.733				Data Not Gamma Distributed at 5% Significance Level		
649					K-S Test Statistic	0.382				Kolmogrov-Smirnoff Gamma GOF Test		
650					5% K-S Critical Value	0.269				Data Not Gamma Distributed at 5% Significance Level		
651						Data Not Gamma Distributed at 5% Significance Level						
652												
653						Gamma Statistics						
654					k hat (MLE)	2.618				k star (bias corrected MLE)		1.9
655					Theta hat (MLE)	0.756				Theta star (bias corrected MLE)		1.042
656					nu hat (MLE)	52.37				nu star (bias corrected)		37.99
657					MLE Mean (bias corrected)	1.98				MLE Sd (bias corrected)		1.437
658										Approximate Chi Square Value (0.05)		24.88
659					Adjusted Level of Significance	0.0267				Adjusted Chi Square Value		23.05
660												
661						Assuming Gamma Distribution						
662					95% Approximate Gamma UCL (use when n>=50))	3.024				95% Adjusted Gamma UCL (use when n<50)		3.264
663												
664						Lognormal GOF Test						
665					Shapiro Wilk Test Statistic	0.753				Shapiro Wilk Lognormal GOF Test		
666					5% Shapiro Wilk Critical Value	0.842				Data Not Lognormal at 5% Significance Level		
667					Lilliefors Test Statistic	0.408				Lilliefors Lognormal GOF Test		
668					5% Lilliefors Critical Value	0.28				Data Not Lognormal at 5% Significance Level		
669						Data Not Lognormal at 5% Significance Level						
670												
671						Lognormal Statistics						
672					Minimum of Logged Data	-1.079				Mean of logged Data		0.48
673					Maximum of Logged Data	1.609				SD of logged Data		0.744
674												
675						Assuming Lognormal Distribution						
676					95% H-UCL	4.067				90% Chebyshev (MVUE) UCL		3.565

677				95% Chebyshev (MVUE) UCL		4.247				97.5% Chebyshev (MVUE) UCL		5.192
678				99% Chebyshev (MVUE) UCL		7.049						
679												
680						**Nonparametric Distribution Free UCL Statistics**						
681						**Data do not follow a Discernible Distribution (0.05)**						
682												
683						**Nonparametric Distribution Free UCLs**						
684					95% CLT UCL	2.622				95% Jackknife UCL		2.696
685				95% Standard Bootstrap UCL		N/A				95% Bootstrap-t UCL		N/A
686				95% Hall's Bootstrap UCL		N/A				95% Percentile Bootstrap UCL		N/A
687				95% BCA Bootstrap UCL		N/A						
688				90% Chebyshev(Mean, Sd) UCL		3.151				95% Chebyshev(Mean, Sd) UCL		3.682
689				97.5% Chebyshev(Mean, Sd) UCL		4.418				99% Chebyshev(Mean, Sd) UCL		5.864
690												
691						**Suggested UCL to Use**						
692				95% Chebyshev (Mean, Sd) UCL		3.682						
693												
694						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
695						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
696						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
697						For additional insight the user may want to consult a statistician.						
698												
699												
700	**Uranium**											
701												
702						**General Statistics**						
703				Total Number of Observations		10				Number of Distinct Observations		5
704										Number of Missing Observations		0
705				Minimum		10				Mean		77.3
706				Maximum		214				Median		10
707				SD		92.47				Std. Error of Mean		29.24
708				Coefficient of Variation		1.196				Skewness		0.8
709												
710						**Normal GOF Test**						
711				Shapiro Wilk Test Statistic		0.701				**Shapiro Wilk GOF Test**		
712				5% Shapiro Wilk Critical Value		0.842				Data Not Normal at 5% Significance Level		
713				Lilliefors Test Statistic		0.367				**Lilliefors GOF Test**		
714				5% Lilliefors Critical Value		0.28				Data Not Normal at 5% Significance Level		
715						**Data Not Normal at 5% Significance Level**						
716												
717						**Assuming Normal Distribution**						
718				**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**		
719				95% Student's-t UCL		130.9				95% Adjusted-CLT UCL (Chen-1995)		133.3
720										95% Modified-t UCL (Johnson-1978)		132.1
721												
722						**Gamma GOF Test**						
723				A-D Test Statistic		1.53				**Anderson-Darling Gamma GOF Test**		
724				5% A-D Critical Value		0.764				Data Not Gamma Distributed at 5% Significance Level		
725				K-S Test Statistic		0.391				**Kolmogrov-Smirnoff Gamma GOF Test**		
726				5% K-S Critical Value		0.278				Data Not Gamma Distributed at 5% Significance Level		
727						**Data Not Gamma Distributed at 5% Significance Level**						
728												

	A	B	C	D	E	F	G	H	I	J	K	L
729						Gamma Statistics						
730					k hat (MLE)	0.667					k star (bias corrected MLE)	0.534
731					Theta hat (MLE)	115.8					Theta star (bias corrected MLE)	144.8
732					nu hat (MLE)	13.35					nu star (bias corrected)	10.68
733					MLE Mean (bias corrected)	77.3					MLE Sd (bias corrected)	105.8
734											Approximate Chi Square Value (0.05)	4.37
735					Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	3.695
736												
737						Assuming Gamma Distribution						
738					95% Approximate Gamma UCL (use when n>=50))	188.9					95% Adjusted Gamma UCL (use when n<50)	223.4
739												
740						Lognormal GOF Test						
741					Shapiro Wilk Test Statistic	0.684					Shapiro Wilk Lognormal GOF Test	
742					5% Shapiro Wilk Critical Value	0.842					Data Not Lognormal at 5% Significance Level	
743					Lilliefors Test Statistic	0.378					Lilliefors Lognormal GOF Test	
744					5% Lilliefors Critical Value	0.28					Data Not Lognormal at 5% Significance Level	
745						Data Not Lognormal at 5% Significance Level						
746												
747						Lognormal Statistics						
748					Minimum of Logged Data	2.303					Mean of logged Data	3.436
749					Maximum of Logged Data	5.366					SD of logged Data	1.48
750												
751						Assuming Lognormal Distribution						
752					95% H-UCL	721.9					90% Chebyshev (MVUE) UCL	191.8
753					95% Chebyshev (MVUE) UCL	243.7					97.5% Chebyshev (MVUE) UCL	315.8
754					99% Chebyshev (MVUE) UCL	457.2						
755												
756						Nonparametric Distribution Free UCL Statistics						
757						Data do not follow a Discernible Distribution (0.05)						
758												
759						Nonparametric Distribution Free UCLs						
760					95% CLT UCL	125.4					95% Jackknife UCL	130.9
761					95% Standard Bootstrap UCL	122.3					95% Bootstrap-t UCL	144.5
762					95% Hall's Bootstrap UCL	110.8					95% Percentile Bootstrap UCL	126
763					95% BCA Bootstrap UCL	127.6						
764					90% Chebyshev(Mean, Sd) UCL	165					95% Chebyshev(Mean, Sd) UCL	204.8
765					97.5% Chebyshev(Mean, Sd) UCL	259.9					99% Chebyshev(Mean, Sd) UCL	368.2
766												
767						Suggested UCL to Use						
768					95% Chebyshev (Mean, Sd) UCL	204.8						
769												
770						Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.						
771						These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)						
772						and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.						
773						For additional insight the user may want to consult a statistician.						
774												
775												
776	Uranium-234											
777												
778						General Statistics						
779					Total Number of Observations	10					Number of Distinct Observations	3
780											Number of Missing Observations	0

	A	B	C	D	E	F	G	H	I	J	K	L
781					Minimum	1.7					Mean	4.305
782					Maximum	6.91					Median	4.305
783					SD	1.228					Std. Error of Mean	0.388
784					Coefficient of Variation	0.285					Skewness	1.332E-15
785												
786					Normal GOF Test							
787					Shapiro Wilk Test Statistic	0.659	Shapiro Wilk GOF Test					
788					5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level					
789					Lilliefors Test Statistic	0.4	Lilliefors GOF Test					
790					5% Lilliefors Critical Value	0.28	Data Not Normal at 5% Significance Level					
791					Data Not Normal at 5% Significance Level							
792												
793					Assuming Normal Distribution							
794				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
795					95% Student's-t UCL	5.017					95% Adjusted-CLT UCL (Chen-1995)	4.944
796											95% Modified-t UCL (Johnson-1978)	5.017
797												
798					Gamma GOF Test							
799					A-D Test Statistic	2.084	Anderson-Darling Gamma GOF Test					
800					5% A-D Critical Value	0.725	Data Not Gamma Distributed at 5% Significance Level					
801					K-S Test Statistic	0.44	Kolmogrov-Smirnoff Gamma GOF Test					
802					5% K-S Critical Value	0.267	Data Not Gamma Distributed at 5% Significance Level					
803					Data Not Gamma Distributed at 5% Significance Level							
804												
805					Gamma Statistics							
806					k hat (MLE)	11.13					k star (bias corrected MLE)	7.858
807					Theta hat (MLE)	0.387					Theta star (bias corrected MLE)	0.548
808					nu hat (MLE)	222.6					nu star (bias corrected)	157.2
809					MLE Mean (bias corrected)	4.305					MLE Sd (bias corrected)	1.536
810											Approximate Chi Square Value (0.05)	129.2
811					Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	124.8
812												
813					Assuming Gamma Distribution							
814					95% Approximate Gamma UCL (use when n>=50))	5.238					95% Adjusted Gamma UCL (use when n<50)	5.423
815												
816					Lognormal GOF Test							
817					Shapiro Wilk Test Statistic	0.607	Shapiro Wilk Lognormal GOF Test					
818					5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level					
819					Lilliefors Test Statistic	0.453	Lilliefors Lognormal GOF Test					
820					5% Lilliefors Critical Value	0.28	Data Not Lognormal at 5% Significance Level					
821					Data Not Lognormal at 5% Significance Level							
822												
823					Lognormal Statistics							
824					Minimum of Logged Data	0.531					Mean of logged Data	1.414
825					Maximum of Logged Data	1.933					SD of logged Data	0.344
826												
827					Assuming Lognormal Distribution							
828					95% H-UCL	5.505					90% Chebyshev (MVUE) UCL	5.767
829					95% Chebyshev (MVUE) UCL	6.414					97.5% Chebyshev (MVUE) UCL	7.313
830					99% Chebyshev (MVUE) UCL	9.078						
831												
832					Nonparametric Distribution Free UCL Statistics							

	A	B	C	D	E	F	G	H	I	J	K	L
833	Data do not follow a Discernible Distribution (0.05)											
834												
835	Nonparametric Distribution Free UCLs											
836					95% CLT UCL	4.944				95% Jackknife UCL		5.017
837					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
838					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
839					95% BCA Bootstrap UCL	N/A						
840					90% Chebyshev(Mean, Sd) UCL	5.47				95% Chebyshev(Mean, Sd) UCL		5.998
841					97.5% Chebyshev(Mean, Sd) UCL	6.73				99% Chebyshev(Mean, Sd) UCL		8.169
842												
843	Suggested UCL to Use											
844					95% Student's-t UCL	5.017				or 95% Modified-t UCL		5.017
845												
846	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
847	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
848	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
849	For additional insight the user may want to consult a statistician.											
850												
851												
852	Uranium-235											
853												
854	General Statistics											
855					Total Number of Observations	10				Number of Distinct Observations		3
856										Number of Missing Observations		0
857					Minimum	0.1				Mean		0.269
858					Maximum	0.438				Median		0.269
859					SD	0.0797				Std. Error of Mean		0.0252
860					Coefficient of Variation	0.296				Skewness		-3.34E-15
861												
862	Normal GOF Test											
863					Shapiro Wilk Test Statistic	0.659				Shapiro Wilk GOF Test		
864					5% Shapiro Wilk Critical Value	0.842				Data Not Normal at 5% Significance Level		
865					Lilliefors Test Statistic	0.4				Lilliefors GOF Test		
866					5% Lilliefors Critical Value	0.28				Data Not Normal at 5% Significance Level		
867	Data Not Normal at 5% Significance Level											
868												
869	Assuming Normal Distribution											
870	95% Normal UCL						95% UCLs (Adjusted for Skewness)					
871					95% Student's-t UCL	0.315				95% Adjusted-CLT UCL (Chen-1995)		0.31
872										95% Modified-t UCL (Johnson-1978)		0.315
873												
874	Gamma GOF Test											
875					A-D Test Statistic	2.092				Anderson-Darling Gamma GOF Test		
876					5% A-D Critical Value	0.725				Data Not Gamma Distributed at 5% Significance Level		
877					K-S Test Statistic	0.442				Kolmogrov-Smirnoff Gamma GOF Test		
878					5% K-S Critical Value	0.267				Data Not Gamma Distributed at 5% Significance Level		
879	Data Not Gamma Distributed at 5% Significance Level											
880												
881	Gamma Statistics											
882					k hat (MLE)	10.12				k star (bias corrected MLE)		7.153
883					Theta hat (MLE)	0.0266				Theta star (bias corrected MLE)		0.0376
884					nu hat (MLE)	202.5				nu star (bias corrected)		143.1

	A	B	C	D	E	F	G	H	I	J	K	L
885					MLE Mean (bias corrected)	0.269					MLE Sd (bias corrected)	0.101
886											Approximate Chi Square Value (0.05)	116.4
887					Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	112.2
888												
889					**Assuming Gamma Distribution**							
890					95% Approximate Gamma UCL (use when n>=50))	0.331					95% Adjusted Gamma UCL (use when n<50)	0.343
891												
892					**Lognormal GOF Test**							
893					Shapiro Wilk Test Statistic	0.603			**Shapiro Wilk Lognormal GOF Test**			
894					5% Shapiro Wilk Critical Value	0.842			Data Not Lognormal at 5% Significance Level			
895					Lilliefors Test Statistic	0.455			**Lilliefors Lognormal GOF Test**			
896					5% Lilliefors Critical Value	0.28			Data Not Lognormal at 5% Significance Level			
897					**Data Not Lognormal at 5% Significance Level**							
898												
899					**Lognormal Statistics**							
900					Minimum of Logged Data	-2.303			Mean of logged Data			-1.363
901					Maximum of Logged Data	-0.826			SD of logged Data			0.364
902												
903					**Assuming Lognormal Distribution**							
904					95% H-UCL	0.35			90% Chebyshev (MVUE) UCL			0.366
905					95% Chebyshev (MVUE) UCL	0.409			97.5% Chebyshev (MVUE) UCL			0.468
906					99% Chebyshev (MVUE) UCL	0.585						
907												
908					**Nonparametric Distribution Free UCL Statistics**							
909					**Data do not follow a Discernible Distribution (0.05)**							
910												
911					**Nonparametric Distribution Free UCLs**							
912					95% CLT UCL	0.31			95% Jackknife UCL			0.315
913					95% Standard Bootstrap UCL	N/A			95% Bootstrap-t UCL			N/A
914					95% Hall's Bootstrap UCL	N/A			95% Percentile Bootstrap UCL			N/A
915					95% BCA Bootstrap UCL	N/A						
916					90% Chebyshev(Mean, Sd) UCL	0.345			95% Chebyshev(Mean, Sd) UCL			0.379
917					97.5% Chebyshev(Mean, Sd) UCL	0.426			99% Chebyshev(Mean, Sd) UCL			0.52
918												
919					**Suggested UCL to Use**							
920					95% Student's-t UCL	0.315					or 95% Modified-t UCL	0.315
921												
922					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
923					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
924					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
925					For additional insight the user may want to consult a statistician.							
926												
927					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
928					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
929												
930												
931	**Uranium-238**											
932												
933					**General Statistics**							
934					Total Number of Observations	10			Number of Distinct Observations			3
935									Number of Missing Observations			0
936					Minimum	2.7			Mean			6.075

	A	B	C	D	E	F	G	H	I	J	K	L
937					Maximum	9.45					Median	6.075
938					SD	1.591					Std. Error of Mean	0.503
939					Coefficient of Variation	0.262					Skewness	-3.19E-15
940												
941					Normal GOF Test							
942					Shapiro Wilk Test Statistic	0.659	Shapiro Wilk GOF Test					
943					5% Shapiro Wilk Critical Value	0.842	Data Not Normal at 5% Significance Level					
944					Lilliefors Test Statistic	0.4	Lilliefors GOF Test					
945					5% Lilliefors Critical Value	0.28	Data Not Normal at 5% Significance Level					
946					Data Not Normal at 5% Significance Level							
947												
948					Assuming Normal Distribution							
949				95% Normal UCL			95% UCLs (Adjusted for Skewness)					
950					95% Student's-t UCL	6.997					95% Adjusted-CLT UCL (Chen-1995)	6.903
951											95% Modified-t UCL (Johnson-1978)	6.997
952												
953					Gamma GOF Test							
954					A-D Test Statistic	2.071	Anderson-Darling Gamma GOF Test					
955					5% A-D Critical Value	0.725	Data Not Gamma Distributed at 5% Significance Level					
956					K-S Test Statistic	0.436	Kolmogrov-Smirnoff Gamma GOF Test					
957					5% K-S Critical Value	0.266	Data Not Gamma Distributed at 5% Significance Level					
958					Data Not Gamma Distributed at 5% Significance Level							
959												
960					Gamma Statistics							
961					k hat (MLE)	13.71					k star (bias corrected MLE)	9.664
962					Theta hat (MLE)	0.443					Theta star (bias corrected MLE)	0.629
963					nu hat (MLE)	274.2					nu star (bias corrected)	193.3
964					MLE Mean (bias corrected)	6.075					MLE Sd (bias corrected)	1.954
965											Approximate Chi Square Value (0.05)	162.1
966					Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	157.2
967												
968					Assuming Gamma Distribution							
969					95% Approximate Gamma UCL (use when n>=50))	7.243					95% Adjusted Gamma UCL (use when n<50)	7.471
970												
971					Lognormal GOF Test							
972					Shapiro Wilk Test Statistic	0.616	Shapiro Wilk Lognormal GOF Test					
973					5% Shapiro Wilk Critical Value	0.842	Data Not Lognormal at 5% Significance Level					
974					Lilliefors Test Statistic	0.448	Lilliefors Lognormal GOF Test					
975					5% Lilliefors Critical Value	0.28	Data Not Lognormal at 5% Significance Level					
976					Data Not Lognormal at 5% Significance Level							
977												
978					Lognormal Statistics							
979					Minimum of Logged Data	0.993					Mean of logged Data	1.767
980					Maximum of Logged Data	2.246					SD of logged Data	0.305
981												
982					Assuming Lognormal Distribution							
983					95% H-UCL	7.506					90% Chebyshev (MVUE) UCL	7.886
984					95% Chebyshev (MVUE) UCL	8.693					97.5% Chebyshev (MVUE) UCL	9.813
985					99% Chebyshev (MVUE) UCL	12.01						
986												
987					Nonparametric Distribution Free UCL Statistics							
988					Data do not follow a Discernible Distribution (0.05)							

	A	B	C	D	E	F	G	H	I	J	K	L
989												
990					Nonparametric Distribution Free UCLs							
991					95% CLT UCL	6.903				95% Jackknife UCL		6.997
992					95% Standard Bootstrap UCL	N/A				95% Bootstrap-t UCL		N/A
993					95% Hall's Bootstrap UCL	N/A				95% Percentile Bootstrap UCL		N/A
994					95% BCA Bootstrap UCL	N/A						
995					90% Chebyshev(Mean, Sd) UCL	7.584				95% Chebyshev(Mean, Sd) UCL		8.268
996					97.5% Chebyshev(Mean, Sd) UCL	9.217				99% Chebyshev(Mean, Sd) UCL		11.08
997												
998					Suggested UCL to Use							
999					95% Student's-t UCL	6.997				or 95% Modified-t UCL		6.997
1000												
1001					Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.							
1002					These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)							
1003					and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.							
1004					For additional insight the user may want to consult a statistician.							
1005												
1006					**Note: For highly negatively-skewed data, confidence limits (e.g., Chen, Johnson, Lognormal, and Gamma) may not be**							
1007					**reliable. Chen's and Johnson's methods provide adjustments for positvely skewed data sets.**							
1008												
1009												
1010	**Vanadium**											
1011												
1012					General Statistics							
1013					Total Number of Observations	10				Number of Distinct Observations		10
1014										Number of Missing Observations		0
1015					Minimum	60				Mean		122.4
1016					Maximum	195				Median		114
1017					SD	37				Std. Error of Mean		11.7
1018					Coefficient of Variation	0.302				Skewness		0.425
1019												
1020					Normal GOF Test							
1021					Shapiro Wilk Test Statistic	0.968				**Shapiro Wilk GOF Test**		
1022					5% Shapiro Wilk Critical Value	0.842				Data appear Normal at 5% Significance Level		
1023					Lilliefors Test Statistic	0.179				**Lilliefors GOF Test**		
1024					5% Lilliefors Critical Value	0.28				Data appear Normal at 5% Significance Level		
1025					**Data appear Normal at 5% Significance Level**							
1026												
1027					Assuming Normal Distribution							
1028					**95% Normal UCL**					**95% UCLs (Adjusted for Skewness)**		
1029					95% Student's-t UCL	143.8				95% Adjusted-CLT UCL (Chen-1995)		143.3
1030										95% Modified-t UCL (Johnson-1978)		144.1
1031												
1032					Gamma GOF Test							
1033					A-D Test Statistic	0.242				**Anderson-Darling Gamma GOF Test**		
1034					5% A-D Critical Value	0.725				Detected data appear Gamma Distributed at 5% Significance Level		
1035					K-S Test Statistic	0.145				**Kolmogrov-Smirnoff Gamma GOF Test**		
1036					5% K-S Critical Value	0.267				Detected data appear Gamma Distributed at 5% Significance Level		
1037					**Detected data appear Gamma Distributed at 5% Significance Level**							
1038												
1039					Gamma Statistics							
1040					k hat (MLE)	11.65				k star (bias corrected MLE)		8.221

	A	B	C	D	E	F	G	H	I	J	K	L
1041					Theta hat (MLE)	10.51					Theta star (bias corrected MLE)	14.89
1042					nu hat (MLE)	233					nu star (bias corrected)	164.4
1043					MLE Mean (bias corrected)	122.4					MLE Sd (bias corrected)	42.69
1044											Approximate Chi Square Value (0.05)	135.8
1045					Adjusted Level of Significance	0.0267					Adjusted Chi Square Value	131.3
1046												
1047					**Assuming Gamma Distribution**							
1048					95% Approximate Gamma UCL (use when n>=50))	148.2					95% Adjusted Gamma UCL (use when n<50)	153.3
1049												
1050					**Lognormal GOF Test**							
1051					Shapiro Wilk Test Statistic	0.955			**Shapiro Wilk Lognormal GOF Test**			
1052					5% Shapiro Wilk Critical Value	0.842			Data appear Lognormal at 5% Significance Level			
1053					Lilliefors Test Statistic	0.166			**Lilliefors Lognormal GOF Test**			
1054					5% Lilliefors Critical Value	0.28			Data appear Lognormal at 5% Significance Level			
1055					**Data appear Lognormal at 5% Significance Level**							
1056												
1057					**Lognormal Statistics**							
1058					Minimum of Logged Data	4.094					Mean of logged Data	4.764
1059					Maximum of Logged Data	5.273					SD of logged Data	0.319
1060												
1061					**Assuming Lognormal Distribution**							
1062					95% H-UCL	152.5					90% Chebyshev (MVUE) UCL	160.1
1063					95% Chebyshev (MVUE) UCL	177					97.5% Chebyshev (MVUE) UCL	200.6
1064					99% Chebyshev (MVUE) UCL	246.8						
1065												
1066					**Nonparametric Distribution Free UCL Statistics**							
1067					**Data appear to follow a Discernible Distribution at 5% Significance Level**							
1068												
1069					**Nonparametric Distribution Free UCLs**							
1070					95% CLT UCL	141.6					95% Jackknife UCL	143.8
1071					95% Standard Bootstrap UCL	140.8					95% Bootstrap-t UCL	146.9
1072					95% Hall's Bootstrap UCL	149.8					95% Percentile Bootstrap UCL	141.8
1073					95% BCA Bootstrap UCL	143						
1074					90% Chebyshev(Mean, Sd) UCL	157.5					95% Chebyshev(Mean, Sd) UCL	173.4
1075					97.5% Chebyshev(Mean, Sd) UCL	195.5					99% Chebyshev(Mean, Sd) UCL	238.8
1076												
1077					**Suggested UCL to Use**							
1078					95% Student's-t UCL	143.8						
1079												
1080	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
1081	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
1082	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
1083	For additional insight the user may want to consult a statistician.											
1084												