C.8-6.1 Soil Indoor Air Aberjona Summary Table

Chemical of Potential Concern	Max. Conc.	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Description	Mean
1,2-Dichloroethene (total)	6.65	3.032240336	(NP)	3.032240	95% UCL-NP	(d)	Chebyshev (Mean, Std)	1.758333333
Naphthalene	26000	5744.105624	(NP)	5744.105624	95% UCL-NP	(d)	Chebyshev (Mean, Std)	1244.362
Chloromethane	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Vinyl chloride	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Bromomethane	17	5.815965788	(NP)	5.815966	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.452380952
Chloroethane	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
1,1-Dichloroethene	17	5.538259458	(NP)	5.538259	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.219047619
Freon 113	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
Acetone	530	146.7041476	(NP)	146.704148	95% UCL-NP	(d)	Chebyshev (Mean, Std)	37.72857143
Carbon disulfide	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Methyl acetate	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
Methylene chloride	140	45.81819836	(NP)	45.818198	95% UCL-NP	(d)	Chebyshev (Mean, Std)	17.94761905
trans-1,2-Dichloroethene	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
Methyl tert-butyl ether	130	322.022006	(T)	130.000000	Max	(c & e)	99% Chebyshev (MVUE) UCL	37.1875
1,1-Dichloroethane	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
cis-1,2-Dichloroethene	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
2-Butanone (MEK)	170	47.47217588	(NP)	47.472176	95% UCL-NP	(d)	Chebyshev (Mean, Std)	13.64772727
1,1,1-Trichloroethane	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Cyclohexane	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
Benzene	44	13.13808506	(NP)	13.138085	95% UCL-NP	(d)	Chebyshev (Mean, Std)	4.290909091
Trichloroethene	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Methyl cyclohexane	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
Toluene	400	100.0032807	(NP)	100.003281	95% UCL-NP	(d)	Chebyshev (Mean, Std)	21.21818182
Tetrachloroethene	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Chlorobenzene	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
Ethylbenzene	4400	1073.988605	(NP)	1073.988605	95% UCL-NP	(d)	Chebyshev (Mean, Std)	202.775
Xylenes (total)	4800	1178.877883	(NP)	1178.877883	95% UCL-NP	(d)	Chebyshev (Mean, Std)	229.6863636
Styrene	17	5.456037177	(NP)	5.456037	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.211904762
Isopropylbenzene	17	N/A	(<4)	17.000000			Too Few Observations To Calculate UCLs	6.25
1,1,2,2-Tetrachloroethane	17	5.7720984	(NP)	5.772098	95% UCL-NP	(d)	Chebyshev (Mean, Std)	2.4
1,3-Dichlorobenzene	354.5	206.3810261	(NP)	206.381026	95% UCL-NP	(d)	Jackknife	175.7261905
1,4-Dichlorobenzene	354.5	206.3810261	(NP)	206.381026	95% UCL-NP	(d)	Jackknife	175.7261905
1,2-Dichlorobenzene	354.5	206.3810261	(NP)	206.381026	95% UCL-NP	(d)	Jackknife	175.7261905
1,2,4-Trichlorobenzene	354.5	206.3810261	(NP)	206.381026	95% UCL-NP	(d)	Jackknife	175.7261905
Benzaldehyde	1900	1687.152673	(T)	1687.152673	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	558.75
2-Methylnaphthalene	32400	7177.28003	(NP)	7177.280030	95% UCL-NP	(d)	Chebyshev (Mean, Std)	1571.42
1,1'-Biphenyl	600	525.0879747	(N)	525.087975	95% UCL-NP	(b)	Student's-t	224
Acenaphthylene	6900	1680.513479	(NP)	1680.513479	95% UCL-NP	(d)	Chebyshev (Mean, Std)	505.012
Acenaphthene	10000	2338.433725	(NP)	2338.433725	95% UCL-NP	(d)	Chebyshev (Mean, Std)	626.172
Dibenzofuran	600	261.7365001	(NP)	261.736500	95% UCL-NP	(d)	Bootstrap-t	197.9545455
Fluorene	1120	430.3917259	(NP)	430.391726	95% UCL-NP	(d)	Chebyshev (Mean, Std)	246.212
Phenanthrene	5000	1297.030269	(NP)	1297.030269	95% UCL-NP	(d)	Chebyshev (Mean, Std)	425.228
Anthracene	2000	670.3193564	(NP)	670.319356	95% UCL-NP	(d)	Chebyshev (Mean, Std)	315.68
C5-C8 Aliphatic	19000	N/A	(<4)	19000.000000	Max	(a)	Too Few Observations To Calculate UCLs	7333.333333
C9-C12 Aliphatic	61000	N/A	(<4)	61000.000000	Max	(a)	Too Few Observations To Calculate UCLs	21000
C9-C10 Aromatic	177000	N/A	(<4)	177000.000000	Max	(a)	Too Few Observations To Calculate UCLs	177000
C9-C18 Aliphatic	2430000	1311245.591	(T)	1311245.591000	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	609982.5
C11-C22 Aromatic	1720000	3379009.875	(T)	1720000.000000	Max	(c & e)	99% Chebyshev (MVUE) UCL	469250
1,2,4-Trimethylbenzene		N/A	(<4)				Too Few Observations To Calculate UCLs	
1,3,5-Trimethylbenzene		N/A	(<4)				Too Few Observations To Calculate UCLs	
n-Butylbenzene		N/A	(<4)				Too Few Observations To Calculate UCLs	
p-Isopropyltoluene		N/A	(<4)				Too Few Observations To Calculate UCLs	
sec-Butylbenzene		N/A	(<4)				Too Few Observations To Calculate UCLs	

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

From File

Summary Statistics for	1,2-Dichloroethene (tota
Number of Samples	18
Minimum	1.25
Maximum	6.65
Mean	1.758333333
Median	1.4
Standard Deviation	1.239930026
Variance	1.537426471
Coefficient of Variation	0.705173475
Skewness	4.035838952
Shapiro-Wilk Test Statisitic	0.384779749
Shapiro-Wilk 5% Critical Val	0.897

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	2.266740824

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	2.536105296
Modified-t	2.31307562

95 % Non-parametric UCL	
CLT	2.239048895
Jackknife	2.266740824
Standard Bootstrap	2.22028343
Bootstrap-t	4.591893575
Chebyshev (Mean, Std)	3.032240336

From File

Summary Statistics for	Naphthalene
Number of Samples	25
Minimum	1.55
Maximum	26000
Mean	1244.362
Median	194
Standard Deviation	5161.559928
Variance	26641700.89
Coefficient of Variation	4.147956887
Skewness	4.987183934

Shapiro-Wilk Test Statisitic	0.228524398
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3010.525857

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4042.577098
Modified-t	3182.136849

95 % Non-parametric UCL

CLT	2942.364115
Jackknife	3010.525857
Standard Bootstrap	2878.239442
Bootstrap-t	67350.93431
Chebyshev (Mean, Std)	5744.105624

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Chloromethane
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.582394421
Bootstrap-t	15.96118304
Chebyshev (Mean, Std)	5.7720984

From File

Summary Statistics for	Vinyl chloride
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028
Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	3.734263324
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	4.380869654
Modified-t	3.844757918
95 % Non-parametric UCL	
CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.63136708
Bootstrap-t	16.22563883
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Bromomethane
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.452380952
Median	1.4
Standard Deviation	3.536187078
Variance	12.50461905
Coefficient of Variation	1.441940362
Skewness	3.909598079

Shapiro-Wilk Test Statisitic	0.397482643
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.783275651

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.4250898
Modified-t	3.892998431

95 % Non-parametric UCL

CLT	3.721647524
Jackknife	3.783275651
Standard Bootstrap	3.675753345
Bootstrap-t	13.37175698
Chebyshev (Mean, Std)	5.815965788

From File

Summary Statistics for	Chloroethane
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.624345052
Bootstrap-t	16.23596432
Chebyshev (Mean, Std)	5.7720984

From File

Summary Statistics for	1,1-Dichloroethene
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.219047619
Median	1.2
Standard Deviation	3.489537082
Variance	12.17686905
Coefficient of Variation	1.57253817
Skewness	4.195277764

Shapiro-Wilk Test Statisitic	0.377024318
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	3.532384923

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	4.216455541
Modified-t	3.648572045

95 % Non-parametric UCL	
CLT	3.471569806
Jackknife	3.532384923
Standard Bootstrap	3.499345271
Bootstrap-t	11.48280878
Chebyshev (Mean, Std)	5.538259458

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Freon 113
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Acetone
Number of Samples	21
Minimum	2.3
Maximum	530
Mean	37.72857143
Median	5.6
Standard Deviation	114.5676542
Variance	13125.74739
Coefficient of Variation	3.036628472
Skewness	4.367303551

Shapiro-Wilk Test Statisitic	0.323711817
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	80.84775045

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	104.3098003
Modified-t	84.81879587

95 % Non-parametric UCL

CLT	78.85108292
Jackknife	80.84775045
Standard Bootstrap	77.02074553
Bootstrap-t	332.7149439
Chebyshev (Mean, Std)	146.7041476

From File

Summary Statistics for	Carbon disulfide
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.643010994
Bootstrap-t	15.55121599
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Methyl acetate
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Methylene chloride
Number of Samples	21
Minimum	2.8
Maximum	140
Mean	17.94761905
Median	8
Standard Deviation	29.30075714
Variance	858.534369
Coefficient of Variation	1.632570708
Skewness	3.963856386
Shapiro-Wilk Test Statisitic	0.462120343
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	28.97537903
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	34.37432703
Modified-t	29.89715676
95 % Non-parametric UCL	
CLT	28.46472992
Jackknife	28.97537903
Standard Bootstrap	28.6492231
Bootstrap-t	52.6912009
Chebyshev (Mean, Std)	45.81819836

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	trans-1,2-Dichloroethene
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Methyl tert-butyl ether
Number of Samples	4
Minimum	0.85
Maximum	130
Mean	37.1875
Median	8.95
Standard Deviation	62.34017398
Variance	3886.297292
Coefficient of Variation	1.676374426
Skewness	1.913854518

95 % UCL (Assuming Normal Data)

Student's-t	110.5420375

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	120.3288528
Modified-t	115.5132885

95 % Non-parametric UCL

CLT	88.45773067
Jackknife	110.5420375
Standard Bootstrap	81.13584409
Bootstrap-t	78455.01073
Chebyshev (Mean, Std)	173.0547592

99 % Non-parametric UCL

Chebyshev (Mean, Std)	347.3259497

Summary Statistics for	ln(Methyl tert-butyl ether
Minimum	-0.16251893
Maximum	4.86753445
Mean	1.858217087
Standard Deviation	2.445786836
Variance	5.981873248
Shapiro-Wilk Test Statisitic	0.869190784
Shapiro-Wilk 5% Critical Val	0.748

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	127.6323304
MLE Standard Deviation	2537.226143
MLE Coefficient of Variation	19.87918058
MLE Skewness	7915.528312
MLE Median	6.412294014
MLE 80% Quantile	50.64836572
MLE 90% Quantile	148.569546
MLE 95% Quantile	358.3594142
MLE 99% Quantile	1895.271291
MVU Estimate of Median	2.585135235
MVU Estimate of Mean	34.23563942
MVU Estimate of Std. Dev.	63.00857081
MVU Estimate of SE of Mea	28.92361812

UCL Assuming Lognormal Distribution

95% H-UCL	2.59E+15
95% Chebyshev (MVUE) UC	160.3107679
99% Chebyshev (MVUE) UC	322.022006

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	1,1-Dichloroethane
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.602809559
Bootstrap-t	16.53100623
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	cis-1,2-Dichloroethene
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	2-Butanone (MEK)
Number of Samples	22
Minimum	2.15
Maximum	170
Mean	13.64772727
Median	3.025
Standard Deviation	36.39697292
Variance	1324.739637
Coefficient of Variation	2.66688894
Skewness	4.180858497
Shapiro-Wilk Test Statisitic	0.346586243
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	27.00045032
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	33.80231154
Modified-t	28.15325784
95 % Non-parametric UCL	
CLT	26.4115623
Jackknife	27.00045032
Standard Bootstrap	25.68547269
Bootstrap-t	139.6919037
Chebyshev (Mean, Std)	47.47217588

From File

Summary Statistics for	1,1,1-Trichloroethane
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.638402036
Bootstrap-t	16.47682068
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Cyclohexane
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	Benzene
Number of Samples	22
Minimum	0.85
Maximum	44
Mean	4.290909091
Median	1.4
Standard Deviation	9.520049474
Variance	90.63134199
Coefficient of Variation	2.218655598
Skewness	3.898277546

Shapiro-Wilk Test Statisitic	0.372812131
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	7.783468329

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	9.4319147
Modified-t	8.064618292

95 % Non-parametric UCL

CLT	7.629437852
Jackknife	7.783468329
Standard Bootstrap	7.438905836
Bootstrap-t	26.38928364
Chebyshev (Mean, Std)	13.13808506

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Trichloroethene
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.638640815
Bootstrap-t	15.8523744
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Methyl cyclohexane
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Toluene
Number of Samples	22
Minimum	0.85
Maximum	400
Mean	21.21818182
Median	1.4
Standard Deviation	84.7771133
Variance	7187.158939
Coefficient of Variation	3.995493772
Skewness	4.659349105

Shapiro-Wilk Test Statisitic	0.251728705
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	52.31981538

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	70.13314805
Modified-t	55.31228634

95 % Non-parametric UCL

CLT	50.94815663
Jackknife	52.31981538
Standard Bootstrap	50.48128186
Bootstrap-t	507.0947316
Chebyshev (Mean, Std)	100.0032807

From File

Summary Statistics for	Tetrachloroethene
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.615600342
Bootstrap-t	16.02655488
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Chlorobenzene
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028
Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	3.734263324
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	4.380869654
Modified-t	3.844757918
95 % Non-parametric UCL	
CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.683839106
Bootstrap-t	16.1913005
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Ethylbenzene
Number of Samples	22
Minimum	0.85
Maximum	4400
Mean	202.775
Median	1.4
Standard Deviation	937.4739075
Variance	878857.3273
Coefficient of Variation	4.623222328
Skewness	4.690241716

Shapiro-Wilk Test Statisitic	0.223015542
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	546.7000148

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	745.0882551
Modified-t	580.0104635

95 % Non-parametric UCL

CLT	531.5320733
Jackknife	546.7000148
Standard Bootstrap	513.9035242
Bootstrap-t	60257.83589
Chebyshev (Mean, Std)	1073.988605

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Xylenes (total)
Number of Samples	22
Minimum	0.7
Maximum	4800
Mean	229.6863636
Median	1.4
Standard Deviation	1021.382445
Variance	1043222.099
Coefficient of Variation	4.446857135
Skewness	4.681667597

Shapiro-Wilk Test Statisitic	0.235030686
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	604.3943631

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	820.1139898
Modified-t	640.6199168

95 % Non-parametric UCL

CLT	587.8688161
Jackknife	604.3943631
Standard Bootstrap	575.7559642
Bootstrap-t	26848.99988
Chebyshev (Mean, Std)	1178.877883

From File

Summary Statistics for	Styrene
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.211904762
Median	1.4
Standard Deviation	3.41060496
Variance	11.63222619
Coefficient of Variation	1.541931198
Skewness	4.486622243

Shapiro-Wilk Test Statisitic	0.313036249
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.49553483

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.214691107
Modified-t	3.616980037

95 % Non-parametric UCL

CLT	3.43609533
Jackknife	3.49553483
Standard Bootstrap	3.39181196
Bootstrap-t	12.92160884
Chebyshev (Mean, Std)	5.456037177

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Isopropylbenzene
Number of Samples	3
Minimum	0.85
Maximum	17
Mean	6.25
Median	0.9

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	1,1,2,2-Tetrachloroethar
Number of Samples	21
Minimum	0.85
Maximum	17
Mean	2.4
Median	1.4
Standard Deviation	3.545137515
Variance	12.568
Coefficient of Variation	1.477140631
Skewness	3.927159028

Shapiro-Wilk Test Statisitic	0.381450134
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	3.734263324

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4.380869654
Modified-t	3.844757918

95 % Non-parametric UCL

CLT	3.672479211
Jackknife	3.734263324
Standard Bootstrap	3.643546486
Bootstrap-t	15.84341356
Chebyshev (Mean, Std)	5.7720984

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	1,3-Dichlorobenzene
Number of Samples	21
Minimum	0.85
Maximum	354.5
Mean	175.7261905
Median	191.5
Standard Deviation	81.44989506
Variance	6634.085405
Coefficient of Variation	0.463504585
Skewness	-0.832592615

Shapiro-Wilk Test Statisitic	0.785010406
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	206.3810261

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	201.5110125
Modified-t	205.8428151

95 % Non-parametric UCL	
CLT	204.9615298
Jackknife	206.3810261
Standard Bootstrap	204.3948222
Bootstrap-t	202.432433
Chebyshev (Mean, Std)	253.2004943

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	1,4-Dichlorobenzene
Number of Samples	21
Minimum	0.85
Maximum	354.5
Mean	175.7261905
Median	191.5
Standard Deviation	81.44989506
Variance	6634.085405
Coefficient of Variation	0.463504585
Skewness	-0.832592615

Shapiro-Wilk Test Statisitic	0.785010406
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	206.3810261

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	201.5110125
Modified-t	205.8428151

95 % Non-parametric UCL

CLT	204.9615298
Jackknife	206.3810261
Standard Bootstrap	204.1884543
Bootstrap-t	202.3394441
Chebyshev (Mean, Std)	253.2004943

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	1,2-Dichlorobenzene
Number of Samples	21
Minimum	0.85
Maximum	354.5
Mean	175.7261905
Median	191.5
Standard Deviation	81.44989506
Variance	6634.085405
Coefficient of Variation	0.463504585
Skewness	-0.832592615

Shapiro-Wilk Test Statisitic	0.785010406
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	206.3810261

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	201.5110125
Modified-t	205.8428151

95 % Non-parametric UCL

CLT	204.9615298
Jackknife	206.3810261
Standard Bootstrap	203.9080422
Bootstrap-t	202.3577031
Chebyshev (Mean, Std)	253.2004943

From File

Summary Statistics for	1,2,4-Trichlorobenzene
Number of Samples	21
Minimum	0.85
Maximum	354.5
Mean	175.7261905
Median	191.5
Standard Deviation	81.44989506
Variance	6634.085405
Coefficient of Variation	0.463504585
Skewness	-0.832592615

Shapiro-Wilk Test Statisitic	0.785010406
Shapiro-Wilk 5% Critical Val	0.908

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	206.3810261

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	201.5110125
Modified-t	205.8428151

95 % Non-parametric UCL

CLT	204.9615298
Jackknife	206.3810261
Standard Bootstrap	203.8518076
Bootstrap-t	202.9065439
Chebyshev (Mean, Std)	253.2004943

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Benzaldehyde
Number of Samples	4
Minimum	65
Maximum	1900
Mean	558.75
Median	135
Standard Deviation	894.7753442
Variance	800622.9167
Coefficient of Variation	1.601387641
Skewness	1.991772918

95 % UCL (Assuming Normal Data)

Student's-t	1611.61571

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1770.711006
Modified-t	1685.873598

95 % Non-parametric UCL

CLT	1294.637236
Jackknife	1611.61571
Standard Bootstrap	1195.806314
Bootstrap-t	1.#INF
Chebyshev (Mean, Std)	2508.867651

Summary Statistics for	ln(Benzaldehyde)
Minimum	4.17438727
Maximum	7.549609165
Mean	5.383636498
Standard Deviation	1.484518009
Variance	2.20379372
Shapiro-Wilk Test Statisitic	0.813727073
Shapiro-Wilk 5% Critical Val	0.748

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	655.5885344
MLE Standard Deviation	1861.146098
MLE Coefficient of Variation	2.838893605
MLE Skewness	31.39622403
MLE Median	217.8129132
MLE 80% Quantile	763.6077307
MLE 90% Quantile	1467.392272
MLE 95% Quantile	2504.059824
MLE 99% Quantile	6881.73024
MVU Estimate of Median	162.5790315
MVU Estimate of Mean	448.0951958
MVU Estimate of Std. Dev.	581.0815735
MVU Estimate of SE of Mea	284.2592805

UCL Assuming Lognormal Distribution

95% H-UCL	54820417.4
95% Chebyshev (MVUE) UC	1687.152673
99% Chebyshev (MVUE) UC	3276.439325

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	2-Methylnaphthalene
Number of Samples	25
Minimum	26
Maximum	32400
Mean	1571.42
Median	194
Standard Deviation	6430.362463
Variance	41349561.41
Coefficient of Variation	4.092071161
Skewness	4.9807364

Shapiro-Wilk Test Statisitic	0.233624986
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	3771.738107

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	5055.713736
Modified-t	3985.25771

95 % Non-parametric UCL	
CLT	3686.821005
Jackknife	3771.738107
Standard Bootstrap	3609.757201
Bootstrap-t	45608.66351
Chebyshev (Mean, Std)	7177.28003

From File

Summary Statistics for	1,1'-Biphenyl	
Number of Samples		4
Minimum		26
Maximum		600
Mean		224
Median		135
Standard Deviation		255.8788776
Variance		65474
Coefficient of Variation		1.142316418
Skewness		1.750291889
Shapiro-Wilk Test Statisitic		0.792136377
Shapiro-Wilk 5% Critical Val		0.748
Data are Normal at 5% Significance Level		
Recommended UCL to use	Student's-t	
95 % UCL (Assuming Normal Data)		
Student's-t		525.0879747
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT		554.0786022
Modified-t		543.7489215
95 % Non-parametric UCL		
CLT		434.4416501
Jackknife		525.0879747
Standard Bootstrap		403.5648625
Bootstrap-t	1.#INF	
Chebyshev (Mean, Std)		781.6750846

From File

Summary Statistics for	Acenaphthylene
Number of Samples	25
Minimum	1.3
Maximum	6900
Mean	505.012
Median	194
Standard Deviation	1348.392673
Variance	1818162.799
Coefficient of Variation	2.670021054
Skewness	4.820870098

Shapiro-Wilk Test Statisitic	0.289500469
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	966.4001145

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1226.425686
Modified-t	1009.736287

95 % Non-parametric UCL

CLT	948.5937159
Jackknife	966.4001145
Standard Bootstrap	943.064632
Bootstrap-t	5166.667983
Chebyshev (Mean, Std)	1680.513479

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Acenaphthene
Number of Samples	25
Minimum	1.3
Maximum	10000
Mean	626.172
Median	194
Standard Deviation	1964.098901
Variance	3857684.494
Coefficient of Variation	3.136676346
Skewness	4.911726574

Shapiro-Wilk Test Statisitic	0.26517287
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	1298.240239

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	1684.626401
Modified-t	1362.554351

95 % Non-parametric UCL	
CLT	1272.303041
Jackknife	1298.240239
Standard Bootstrap	1254.064361
Bootstrap-t	9628.660852
Chebyshev (Mean, Std)	2338.433725

From File

Summary Statistics for	Dibenzofuran
Number of Samples	22
Minimum	26
Maximum	600
Mean	197.9545455
Median	188.25
Standard Deviation	100.0933979
Variance	10018.68831
Coefficient of Variation	0.50563829
Skewness	3.103094929

Shapiro-Wilk Test Statisitic	0.604900135
Shapiro-Wilk 5% Critical Val	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	234.6751657

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	248.1411443
Modified-t	237.0281908

95 % Non-parametric UCL	
CLT	233.0556958
Jackknife	234.6751657
Standard Bootstrap	231.6756821
Bootstrap-t	261.7365001
Chebyshev (Mean, Std)	290.9733798

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Fluorene
Number of Samples	25
Minimum	1.3
Maximum	1120
Mean	246.212
Median	194
Standard Deviation	211.2686349
Variance	44634.4361
Coefficient of Variation	0.858076109
Skewness	3.341980897

Shapiro-Wilk Test Statisitic	0.566957443
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	318.5031353

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	345.8904276
Modified-t	323.2101736

95 % Non-parametric UCL	
CLT	315.7131961
Jackknife	318.5031353
Standard Bootstrap	314.3626826
Bootstrap-t	436.6577966
Chebyshev (Mean, Std)	430.3917259

From File

Summary Statistics for	Phenanthrene
Number of Samples	25
Minimum	7.4
Maximum	5000
Mean	425.228
Median	191.5
Standard Deviation	1000.025786
Variance	1000051.573
Coefficient of Variation	2.35174021
Skewness	4.351154381

Shapiro-Wilk Test Statisitic	0.385111517
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	767.4131968

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	940.1828634
Modified-t	796.4216406

95 % Non-parametric UCL

CLT	754.2072085
Jackknife	767.4131968
Standard Bootstrap	742.7311006
Bootstrap-t	1626.045287
Chebyshev (Mean, Std)	1297.030269

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	Anthracene
Number of Samples	25
Minimum	26
Maximum	2000
Mean	315.68
Median	194
Standard Deviation	406.799241
Variance	165485.6225
Coefficient of Variation	1.288644327
Skewness	3.534004559
Shapiro-Wilk Test Statisitic	0.471013682
Shapiro-Wilk 5% Critical Val	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	454.877089
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	510.9501966
Modified-t	464.4612915
95 % Non-parametric UCL	
CLT	449.5050415
Jackknife	454.877089
Standard Bootstrap	447.4768777
Bootstrap-t	817.5045188
Chebyshev (Mean, Std)	670.3193564

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	C5-C8 Aliphatic
Number of Samples	3
Minimum	1000
Maximum	19000
Mean	7333.333333
Median	2000

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	C9-C12 Aliphatic
Number of Samples	3
Minimum	1000
Maximum	61000
Mean	21000
Median	1000

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C9-C10 Aromatic
Number of Samples	1
Minimum	177000
Maximum	177000
Mean	177000
Median	177000

Too Few Observations To Calculate UCLs

C.8-6.1 Soil Indoor Air Aberjona Summary Table

From File

Summary Statistics for	C9-C18 Aliphatic
Number of Samples	4
Minimum	1560
Maximum	2430000
Mean	609982.5
Median	4185
Standard Deviation	1213347.396
Variance	1.47E+12
Coefficient of Variation	1.989151158
Skewness	1.99997631

95 % UCL (Assuming Normal Data)	
Student's-t	2037706.092

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	2256103.89
Modified-t	2138817.177

95 % Non-parametric UCL	
CLT	1607871.933
Jackknife	2037706.092
Standard Bootstrap	1486384.152
Bootstrap-t	1.42E+10
Chebyshev (Mean, Std)	3254411.842

Summary Statistics for	ln(C9-C18 Aliphatic)
Minimum	7.3524411
Maximum	14.70340182
Mean	9.569304229
Standard Deviation	3.488773228
Variance	12.17153864
Shapiro-Wilk Test Statisitic	0.765535962
Shapiro-Wilk 5% Critical Val	0.748

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	6293787.209
MLE Standard Deviation	2766476369
MLE Coefficient of Variation	439.5567051
MLE Skewness	84928112.32
MLE Median	14318.45049
MLE 80% Quantile	273024.7165
MLE 90% Quantile	1267272.9
MLE 95% Quantile	4449650.845
MLE 99% Quantile	47879153.44
MVU Estimate of Median	568.389152
MVU Estimate of Mean	256343.3763
MVU Estimate of Std. Dev.	580308.6083
MVU Estimate of SE of Mea	242011.1656

UCL Assuming Lognormal Distribution	
95% H-UCL	7.04E+33
95% Chebyshev (MVUE) UC	1311245.591
99% Chebyshev (MVUE) UC	2664324.071

Recommended UCL to use:

Needs further investigation.

From File

Summary Statistics for	C11-C22 Aromatic
Number of Samples	4
Minimum	11000
Maximum	1720000
Mean	469250
Median	73000
Standard Deviation	835553.0604
Variance	6.98E+11
Coefficient of Variation	1.780613874
Skewness	1.975733371

95 % UCL (Assuming Normal Data)	
Student's-t	1452429.937

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	1597415.201
Modified-t	1521214.523

95 % Non-parametric UCL	
CLT	1156431.241
Jackknife	1452429.937
Standard Bootstrap	1057781.793
Bootstrap-t	94486886.5
Chebyshev (Mean, Std)	2290295.676

99 % Non-parametric UCL	
Chebyshev (Mean, Std)	4626073.99

Summary Statistics for	ln(C11-C22 Aromatic)
Minimum	9.305650552
Maximum	14.35783485
Mean	11.3053495
Standard Deviation	2.294536581
Variance	5.26489812
Shapiro-Wilk Test Statisitic	0.914631036
Shapiro-Wilk 5% Critical Val	0.748

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	1130079.514
MLE Standard Deviation	15676227.48
MLE Coefficient of Variation	13.87179157
MLE Skewness	2710.917082
MLE Median	81255.151
MLE 80% Quantile	564803.3552
MLE 90% Quantile	1550098.447
MLE 95% Quantile	3540796.182
MLE 99% Quantile	16893535.32
MVU Estimate of Median	37397.83952
MVU Estimate of Mean	368422.7059
MVU Estimate of Std. Dev.	651113.7595
MVU Estimate of SE of Mea	302575.3951

UCL Assuming Lognormal Distribution	
95% H-UCL	5.87E+17
95% Chebyshev (MVUE) UC	1687318.276
99% Chebyshev (MVUE) UC	3379009.875

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

Chemical of Potential Concern	Max. Conc.	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Description	Mean
Naphthalene	12000	2737.645629	(T)	2737.645629	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	1262.666667
Chloroethane	1750	396.5609442	(NP)	396.560944	95% UCL-NP	(d)	Chebyshev (Mean, Std)	94.924
1,1-Dichloroethene	940	225.1554367	(NP)	225.155437	95% UCL-NP	(d)	Chebyshev (Mean, Std)	63.44
trans-1,2-Dichloroethene	200	77.31894195	(NP)	77.318942	95% UCL-NP	(d)	Bootstrap-t	44.64117647
1,1-Dichloroethane	1100	358.1979181	(NP)	358.197918	95% UCL-NP	(d)	Chebyshev (Mean, Std)	113.316
cis-1,2-Dichloroethene	380	179.8289817	(NP)	179.828982	95% UCL-NP	(d)	Chebyshev (Mean, Std)	66.43529412
Methyl cyclohexane	1300	444.9035808	(NP)	444.903581	95% UCL-NP	(d)	Chebyshev (Mean, Std)	120.9823529
Chlorobenzene	940	310.636807	(NP)	310.636807	95% UCL-NP	(d)	Chebyshev (Mean, Std)	95.616
Phenanthrene	68000	36639.32151	(T)	36639.321510	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	8831.708333
C5-C8 Aliphatic	144000	98320.18078	(NP)	98320.180780	95% UCL-NP	(d)	Chebyshev (Mean, Std)	22606.25
C9-C12 Aliphatic	146000	61051.36159	(T)	61051.361590	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	24687.5
C9-C10 Aromatic	498000	430840.3677	(T)	430840.367700	95% UCL-NP	(c)	99% Chebyshev (MVUE) UCL	102420
C9-C18 Aliphatic	6040000	7665195.088	(T)	6040000.000000	Max	(c & e)	Chebyshev (Mean, Std)	924790
C11-C22 Aromatic	4100000	5345009.023	(T)	4100000.000000	Max	(c & e)	99% Chebyshev (MVUE) UCL	923873.3333
Chloromethane	940	249.0519805	(NP)	249.0519805	95% UCL-NP	(d)	Chebyshev (Mean, Std)	73.556
1,2-Dichloroethene (total)	470	315.2880926	(NP)	315.2880926	95% UCL-NP	(d)	Chebyshev (Mean, Std)	59.95
1,2-Dichlorobenzene	201	103.8876069	(NP)	103.8876069	95% UCL-NP	(d)	Bootstrap-t	72.922
Vinyl chloride	940	261.3384456	(NP)	261.3384456	95% UCL-NP	(d)	Bootstrap-t	88.928
Methylene chloride	2690	726.5086831	(NP)	726.5086831	95% UCL-NP	(d)	Bootstrap-t	306.696
Benzene	940	244.4320838	(NP)	244.4320838	95% UCL-NP	(d)	Chebyshev (Mean, Std)	80.788
Trichloroethene	940	290.8058839	(NP)	290.8058839	95% UCL-NP	(d)	Chebyshev (Mean, Std)	90.676
Toluene	3900	585.2888868	(T)	585.2888868	95% UCL-T	(c)	95 % Chebyshev (MVUE) UCL	219.36
Tetrachloroethene	570	146.9501402	(NP)	146.9501402	95% UCL-NP	(d)	Chebyshev (Mean, Std)	48.344
Ethylbenzene	570	183.9736377	(NP)	183.9736377	95% UCL-NP	(d)	Bootstrap-t	94.2
Isopropylbenzene	120	56.22502947	(NP)	56.22502947	95% UCL-NP	(d)	Bootstrap-t	39.16470588
1,3-Dichlorobenzene	402	210.4268145	(NP)	210.4268145	95% UCL-NP	(d)	Bootstrap-t	149.308
1,4-Dichlorobenzene	640	249.99884	(NP)	249.99884	95% UCL-NP	(d)	Bootstrap-t	169.74
2-Methylnaphthalene	20000	5407.449632	(NP)	5407.449632	95% UCL-NP	(d)	Bootstrap-t	1931
Acenaphthylene	2300	1788.353417	(NP)	1788.353417	95% UCL-NP	(d)	Bootstrap-t	480.0791667
Dibenzofuran	4600	1788.353417	(T)	1788.353417	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	852.5
Fluorene	9800	3666.802092	(T)	3666.802092	95% UCL-T	(c)	95 % Chebyshev (MVUE) UCL	2002.420882
1,2,4-Trimethylbenzene		N/A	(<4)		Max	(a)		
1,3,5-Trimethylbenzene		N/A	(<4)		Max	(a)		
Acetone	940	323.9541192	(T)	323.9541	95% UCL-N	(c)	95% H-UCL	116.578
p-Isopropyltoluene		N/A	(<4)		Max	(a)		
Chloromethane	940	249.0519805	(NP)	249.0519805	95% UCL-NP	(d)	Chebyshev (Mean, Std)	73.556
Vinyl chloride	940	261.3384456	(NP)	261.3384456	95% UCL-NP	(d)	Bootstrap-t	88.928
Methylene chloride	2690	726.5086831	(NP)	726.5086831	95% UCL-NP	(d)	Bootstrap-t	306.696
Benzene	940	244.4320838	(NP)	244.4320838	95% UCL-NP	(d)	Chebyshev (Mean, Std)	80.788
Trichloroethene	940	290.8058839	(NP)	290.8058839	95% UCL-NP	(d)	Chebyshev (Mean, Std)	90.676
Toluene	3900	585.2888868	(T)	585.2888868	95% UCL-T	(c)	95 % Chebyshev (MVUE) UCL	219.36
Tetrachloroethene	570	146.9501402	(NP)	146.9501402	95% UCL-NP	(d)	Chebyshev (Mean, Std)	48.344
Ethylbenzene	570	183.9736377	(NP)	183.9736377	95% UCL-NP	(d)	Bootstrap-t	94.2
Isopropylbenzene	120	56.22502947	(NP)	56.22502947	95% UCL-NP	(d)	Bootstrap-t	39.16470588
1,3-Dichlorobenzene	402	210.4268145	(NP)	210.4268145	95% UCL-NP	(d)	Bootstrap-t	149.308
1,4-Dichlorobenzene	640	249.99884	(NP)	249.99884	95% UCL-NP	(d)	Bootstrap-t	169.74
2-Methylnaphthalene	20000	5407.449632	(NP)	5407.449632	95% UCL-NP	(d)	Bootstrap-t	1931
Acenaphthylene	2300	1788.353417	(NP)	1788.353417	95% UCL-NP	(d)	Bootstrap-t	480.0791667
Dibenzofuran	4600	1788.353417	(T)	1788.353417	95% UCL-NP	(c)	95% Chebyshev (MVUE) UCL	852.5
Fluorene	9800	3666.802092	(T)	3666.802092	95% UCL-T	(c)	95 % Chebyshev (MVUE) UCL	2002.420882
1,2,4-Trimethylbenzene		N/A	(<4)					
1,3,5-Trimethylbenzene		N/A	(<4)					
p-Isopropyltoluene		N/A	(<4)					

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

From File

Summary Statistics for	Naphthalene
Number of Samples	24
Minimum	38
Maximum	12000
Mean	1262.666667
Median	393
Standard Deviation	2590.004426
Variance	6708122.928
Coefficient of Variation	2.051217867
Skewness	3.600119396

95 % UCL (Assuming Normal Data)

Student's-t	2168.760292

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2547.40425
Modified-t	2233.51255

95 % Non-parametric UCL

CLT	2132.271896
Jackknife	2168.760292
Standard Bootstrap	2127.321866
Bootstrap-t	4626.861648
Chebyshev (Mean, Std)	3567.139994

Summary Statistics for	ln(Naphthalene)
Minimum	3.63758616
Maximum	9.392661929
Mean	6.117123877
Standard Deviation	1.383878044
Variance	1.91511844
Shapiro-Wilk Test Statisitic	0.958907106
Shapiro-Wilk 5% Critical Valu	0.916

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1181.668968
MLE Standard Deviation	2842.827043
MLE Coefficient of Variation	2.405772785
MLE Skewness	21.14131221
MLE Median	453.5583274
MLE 80% Quantile	1460.45137
MLE 90% Quantile	2684.922557
MLE 95% Quantile	4418.710805
MLE 99% Quantile	11339.23605
MVU Estimate of Median	435.7905113
MVU Estimate of Mean	1100.841109
MVU Estimate of Std. Dev.	2078.120385
MVU Estimate of SE of Mean	375.5087101

UCL Assuming Lognormal Distribution

95% H-UCL	2860.525915
95% Chebyshev (MVUE) UCl	2737.645629
99% Chebyshev (MVUE) UCl	4837.1056

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Chloroethane
Number of Samples	25
Minimum	1.9
Maximum	1750
Mean	94.924
Median	2.9
Standard Deviation	346.0013045
Variance	119716.9027
Coefficient of Variation	3.645035023
Skewness	4.944365071

Shapiro-Wilk Test Statisitic	0.266257918
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	213.3174716

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	281.8670356
Modified-t	224.7225167

95 % Non-parametric UCL

CLT	208.7483002
Jackknife	213.3174716
Standard Bootstrap	201.8549575
Bootstrap-t	1099.382046
Chebyshev (Mean, Std)	396.5609442

From File

Summary Statistics for	1,1-Dichloroethen
Number of Samples	25
Minimum	1.1
Maximum	940
Mean	63.44
Median	2.7
Standard Deviation	185.5003279
Variance	34410.37167
Coefficient of Variation	2.924027868
Skewness	4.757074622

Shapiro-Wilk Test Statisitic	0.334112978
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	126.9138295

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	162.1801275
Modified-t	132.7967555

95 % Non-parametric UCL

CLT	124.4641775
Jackknife	126.9138295
Standard Bootstrap	123.7865833
Bootstrap-t	372.4412377
Chebyshev (Mean, Std)	225.1554367

From File

Summary Statistics for	trans-1,2-Dichloro
Number of Samples	17
Minimum	1.9
Maximum	200
Mean	44.64117647
Median	45
Standard Deviation	51.79638089
Variance	2682.865074
Coefficient of Variation	1.160282613
Skewness	1.809399292

Shapiro-Wilk Test Statisitic	0.779215685
Shapiro-Wilk 5% Critical Valu	0.892

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	66.57378176

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	71.19527546
Modified-t	67.49260857

95 % Non-parametric UCL

CLT	65.3045969
Jackknife	66.57378176
Standard Bootstrap	65.01658204
Bootstrap-t	77.31894195
Chebyshev (Mean, Std)	99.39970328

From File

Summary Statistics for	1,1-Dichloroethan
Number of Samples	25
Minimum	2
Maximum	1100
Mean	113.316
Median	2.9
Standard Deviation	280.8988247
Variance	78904.14973
Coefficient of Variation	2.478898167
Skewness	3.091084039

Shapiro-Wilk Test Statisitic	0.437188665
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	209.4329411

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	242.8343606
Modified-t	215.2214869

95 % Non-parametric UCL

CLT	205.7234902
Jackknife	209.4329411
Standard Bootstrap	205.2507117
Bootstrap-t	497.047555
Chebyshev (Mean, Std)	358.1979181

From File

Summary Statistics for	cis-1,2-Dichloroetl
Number of Samples	17
Minimum	1.9
Maximum	380
Mean	66.43529412
Median	45
Standard Deviation	107.2596904
Variance	11504.64118
Coefficient of Variation	1.614498615
Skewness	2.392522245

Shapiro-Wilk Test Statisitic	0.607586295
Shapiro-Wilk 5% Critical Valu	0.892

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	111.8532251

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	125.3546189
Modified-t	114.3691192

95 % Non-parametric UCL

CLT	109.2250033
Jackknife	111.8532251
Standard Bootstrap	108.3243085
Bootstrap-t	214.3264787
Chebyshev (Mean, Std)	179.8289817

From File

Summary Statistics for	Methyl cyclohexar
Number of Samples	17
Minimum	1.5
Maximum	1300
Mean	120.9823529
Median	48
Standard Deviation	306.3988072
Variance	93880.22904
Coefficient of Variation	2.532590909
Skewness	4.010175611

Shapiro-Wilk Test Statisitic	0.362484159
Shapiro-Wilk 5% Critical Valu	0.892

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	250.723543

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	320.4450202
Modified-t	262.7697492

95 % Non-parametric UCL

CLT	243.2157458
Jackknife	250.723543
Standard Bootstrap	240.4399498
Bootstrap-t	1181.832348
Chebyshev (Mean, Std)	444.9035808

From File

Summary Statistics for	Chlorobenzene
Number of Samples	25
Minimum	0.7
Maximum	940
Mean	95.616
Median	2.9
Standard Deviation	246.6457812
Variance	60834.1414
Coefficient of Variation	2.579545068
Skewness	3.23937762

Shapiro-Wilk Test Statisitic	0.395064971
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	180.0123589

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	210.9040595
Modified-t	185.3388844

95 % Non-parametric UCL

CLT	176.7552416
Jackknife	180.0123589
Standard Bootstrap	175.4060555
Bootstrap-t	747.3575873
Chebyshev (Mean, Std)	310.636807

From File

Summary Statistics for	Phenanthrene
Number of Samples	24
Minimum	39
Maximum	68000
Mean	8831.708333
Median	3350
Standard Deviation	14954.94706
Variance	223650441.4
Coefficient of Variation	1.693324382
Skewness	3.056565167

95 % UCL (Assuming Normal Data)

Student's-t	14063.58441

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	15888.0059
Modified-t	14381.02032

95 % Non-parametric UCL

CLT	13852.89672
Jackknife	14063.58441
Standard Bootstrap	13763.97976
Bootstrap-t	19413.36415
Chebyshev (Mean, Std)	22137.97

Summary Statistics for	ln(Phenanthrene)
Minimum	3.663561646
Maximum	11.12726298
Mean	7.815384645
Standard Deviation	1.858578843
Variance	3.454315316
Shapiro-Wilk Test Statisitic	0.964416349
Shapiro-Wilk 5% Critical Valu	0.916

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	13940.34319
MLE Standard Deviation	77160.29718
MLE Coefficient of Variation	5.535035698
MLE Skewness	186.1798935
MLE Median	2478.440089
MLE 80% Quantile	11918.9371
MLE 90% Quantile	27001.79051
MLE 95% Quantile	52719.82457
MLE 99% Quantile	186920.5677
MVU Estimate of Median	2305.864866
MVU Estimate of Mean	11799.07071
MVU Estimate of Std. Dev.	37420.8915
MVU Estimate of SE of Mean	5698.744368

UCL Assuming Lognormal Distribution

95% H-UCL	61022.27533
95% Chebyshev (MVUE) UCl	36639.32151
99% Chebyshev (MVUE) UCl	68500.86124

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	C5-C8 Aliphatic
Number of Samples	8
Minimum	1850
Maximum	144000
Mean	22606.25
Median	6000
Standard Deviation	49129.6858
Variance	2413726027
Coefficient of Variation	2.173278885
Skewness	2.810244198

Shapiro-Wilk Test Statisitic	0.470552911
Shapiro-Wilk 5% Critical Valu	0.818

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	55515.01594

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	69618.04871
Modified-t	58391.39958

95 % Non-parametric UCL

CLT	51177.30323
Jackknife	55515.01594
Standard Bootstrap	49127.4229
Bootstrap-t	379520.6745
Chebyshev (Mean, Std)	98320.18078

From File

Summary Statistics for	C9-C12 Aliphatic
Number of Samples	8
Minimum	1000
Maximum	146000
Mean	24687.5
Median	8500
Standard Deviation	49153.50409
Variance	2416066964
Coefficient of Variation	1.991028014
Skewness	2.796996529

95 % UCL (Assuming Normal Data)

Student's-t	57612.22026

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	71635.11725
Modified-t	60476.43235

95 % Non-parametric UCL

CLT	53272.4046
Jackknife	57612.22026
Standard Bootstrap	51970.99052
Bootstrap-t	334265.6143
Chebyshev (Mean, Std)	100438.1372

Summary Statistics for	ln(C9-C12 Aliphat
Minimum	6.907755279
Maximum	11.8913619
Mean	9.075473752
Standard Deviation	1.397795462
Variance	1.953832154
Shapiro-Wilk Test Statisitic	0.891237453
Shapiro-Wilk 5% Critical Valu	0.818

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	23211.19138
MLE Standard Deviation	57118.74884
MLE Coefficient of Variation	2.460827964
MLE Skewness	22.28445647
MLE Median	8738.324554
MLE 80% Quantile	28470.13486
MLE 90% Quantile	52661.55283
MLE 95% Quantile	87103.05935
MLE 99% Quantile	225651.2617
MVU Estimate of Median	7720.631404
MVU Estimate of Mean	19197.32554
MVU Estimate of Std. Dev.	28695.44037
MVU Estimate of SE of Mean	9601.974394

UCL Assuming Lognormal Distribution

95% H-UCL	259661.5132
95% Chebyshev (MVUE) UCl	61051.36159
99% Chebyshev (MVUE) UCl	114735.7645

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	C9-C10 Aromatic
Number of Samples	5
Minimum	1100
Maximum	498000
Mean	102420
Median	4000
Standard Deviation	221140.7516
Variance	4.89E+10
Coefficient of Variation	2.159155942
Skewness	2.235824439

95 % UCL (Assuming Normal Data)

Student's-t	313253.4884

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	370752.8658
Modified-t	329734.5516

95 % Non-parametric UCL

CLT	265091.337
Jackknife	313253.4884
Standard Bootstrap	246998.0235
Bootstrap-t	39677595.74
Chebyshev (Mean, Std)	533502.6853

99 % Non-parametric UCL

Chebyshev (Mean, Std)	1086434.224

Summary Statistics for	ln(C9-C10 Aromat
Minimum	7.003065459
Maximum	13.11835536
Mean	9.045342657
Standard Deviation	2.354153396
Variance	5.542038213
Shapiro-Wilk Test Statisitic	0.764992437
Shapiro-Wilk 5% Critical Valu	0.762

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	135450.5305
MLE Standard Deviation	2159565.832
MLE Coefficient of Variation	15.94357604
MLE Skewness	4100.649762
MLE Median	8478.956418
MLE 80% Quantile	61982.18457
MLE 90% Quantile	174630.8806
MLE 95% Quantile	407552.4823
MLE 99% Quantile	2025046.978
MVU Estimate of Median	4572.06874
MVU Estimate of Mean	47621.15862
MVU Estimate of Std. Dev.	96921.95553
MVU Estimate of SE of Mean	38514.97967

UCL Assuming Lognormal Distribution

95% H-UCL	5.71E+10
95% Chebyshev (MVUE) UCl	215504.0628
99% Chebyshev (MVUE) UCl	430840.3677

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	C9-C18 Aliphatic
Number of Samples	9
Minimum	3500
Maximum	6040000
Mean	924790
Median	20000
Standard Deviation	2032308.601
Variance	4.13E+12
Coefficient of Variation	2.197589292
Skewness	2.494808408

95 % UCL (Assuming Normal Data)

Student's-t	2184515.151

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2641029.408
Modified-t	2278408.125

95 % Non-parametric UCL

CLT	2039073.392
Jackknife	2184515.151
Standard Bootstrap	1963487.545
Bootstrap-t	56651809.96
Chebyshev (Mean, Std)	3877665.938

99 % Non-parametric UCL

Chebyshev (Mean, Std)	7665195.088

Summary Statistics for	ln(C9-C18 Aliphat
Minimum	8.160518247
Maximum	15.61391457
Mean	10.94564596
Standard Deviation	2.60205623
Variance	6.770696626
Shapiro-Wilk Test Statisitic	0.879406705
Shapiro-Wilk 5% Critical Valu	0.829

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1674448.265
MLE Standard Deviation	49415209.1
MLE Coefficient of Variation	29.51133823
MLE Skewness	25790.52168
MLE Median	56706.60436
MLE 80% Quantile	511132.1655
MLE 90% Quantile	1606049.858
MLE 95% Quantile	4098077.261
MLE 99% Quantile	24107384.3
MVU Estimate of Median	38331.38599
MVU Estimate of Mean	651656.7198
MVU Estimate of Std. Dev.	2143721.825
MVU Estimate of SE of Mean	519797.571

UCL Assuming Lognormal Distribution

95% H-UCL	1616943250
95% Chebyshev (MVUE) UCl	2917401.803
99% Chebyshev (MVUE) UCl	5823577.249

Recommended UCL to use:
Greater of
99 % Chebyshev (MVUE) UCL
99 % Chebyshev (Mean, Std)

From File

Summary Statistics for	C11-C22 Aromati
Number of Samples	9
Minimum	47860
Maximum	4100000
Mean	923873.3333
Median	232000
Standard Deviation	1422271.781
Variance	2.02E+12
Coefficient of Variation	1.539466212
Skewness	1.862018142

95 % UCL (Assuming Normal Data)

Student's-t	1805467.562

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2018098.798
Modified-t	1854510.078

95 % Non-parametric UCL

CLT	1703682.966
Jackknife	1805467.562
Standard Bootstrap	1659264.158
Bootstrap-t	5699546.497
Chebyshev (Mean, Std)	2990386.321

99 % Non-parametric UCL

Chebyshev (Mean, Std)	5641015.181

Summary Statistics for	ln(C11-C22 Arom
Minimum	10.77603536
Maximum	15.22649753
Mean	12.67764218
Standard Deviation	1.549465511
Variance	2.400843369
Shapiro-Wilk Test Statisitic	0.925165568
Shapiro-Wilk 5% Critical Valu	0.829

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1064551.209
MLE Standard Deviation	3371868.6
MLE Coefficient of Variation	3.167408548
MLE Skewness	41.27917877
MLE Median	320501.4835
MLE 80% Quantile	1187001.029
MLE 90% Quantile	2347133.526
MLE 95% Quantile	4100063.213
MLE 99% Quantile	11777470.23
MVU Estimate of Median	279967.3297
MVU Estimate of Mean	848954.0845
MVU Estimate of Std. Dev.	1475353.884
MVU Estimate of SE of Mean	451870.5233

UCL Assuming Lognormal Distribution

95% H-UCL	13671593.27
95% Chebyshev (MVUE) UCl	2818612.031
99% Chebyshev (MVUE) UCl	5345009.023

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Chloromethane
Number of Samples	25
Minimum	1.8
Maximum	940
Mean	73.556
Median	2.8
Standard Deviation	201.3076958
Variance	40524.7884
Coefficient of Variation	2.736795038
Skewness	3.876667499

Shapiro-Wilk Test Statisitic	0.391005694
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	142.4387373

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	173.1352152
Modified-t	147.641424

95 % Non-parametric UCL

CLT	139.7803388
Jackknife	142.4387373
Standard Bootstrap	138.1882449
Bootstrap-t	545.7259436
Chebyshev (Mean, Std)	249.0519805

From File

Summary Statistics for	Vinyl chloride
Number of Samples	25
Minimum	1.9
Maximum	940
Mean	88.928
Median	2.9
Standard Deviation	202.3720677
Variance	40954.45377
Coefficient of Variation	2.27568446
Skewness	3.517090381

Shapiro-Wilk Test Statisitic	0.487124387
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	158.1749402

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	185.9235572
Modified-t	162.9200125

95 % Non-parametric UCL

CLT	155.5024859
Jackknife	158.1749402
Standard Bootstrap	155.1836642
Bootstrap-t	261.3384456
Chebyshev (Mean, Std)	265.3518784

From File

Summary Statistics for	Methylene chlorid
Number of Samples	25
Minimum	4.7
Maximum	2690
Mean	306.696
Median	38.1
Standard Deviation	581.8723639
Variance	338575.4479
Coefficient of Variation	1.897228408
Skewness	3.168309261

Shapiro-Wilk Test Statisitic	0.571897821
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	505.7989752

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	576.9094373
Modified-t	518.0893192

95 % Non-parametric UCL

CLT	498.1149738
Jackknife	505.7989752
Standard Bootstrap	497.2846195
Bootstrap-t	726.5086831
Chebyshev (Mean, Std)	813.9605665

From File

Summary Statistics for	Benzene
Number of Samples	25
Minimum	0.6
Maximum	940
Mean	80.788
Median	45
Standard Deviation	187.7126379
Variance	35236.03443
Coefficient of Variation	2.323521289
Skewness	4.32126506

Shapiro-Wilk Test Statisitic	0.433522309
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	145.0188297

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	177.2092429
Modified-t	150.4265368

95 % Non-parametric UCL

CLT	142.5399627
Jackknife	145.0188297
Standard Bootstrap	139.9825082
Bootstrap-t	284.1756477
Chebyshev (Mean, Std)	244.4320838

From File

Summary Statistics for	Trichloroethene
Number of Samples	25
Minimum	1.4
Maximum	940
Mean	90.676
Median	2.9
Standard Deviation	229.5647209
Variance	52699.96107
Coefficient of Variation	2.531703217
Skewness	3.280548546

Shapiro-Wilk Test Statisitic	0.420685049
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	169.2276236

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	198.3839267
Modified-t	174.2482784

95 % Non-parametric UCL

CLT	166.1960728
Jackknife	169.2276236
Standard Bootstrap	164.241911
Bootstrap-t	607.2842087
Chebyshev (Mean, Std)	290.8058839

Summary Statistics for	Toluene
Number of Samples	25
Minimum	0.6
Maximum	3900
Mean	219.36
Median	23
Standard Deviation	774.9576784
Variance	600559.4033
Coefficient of Variation	3.532812174
Skewness	4.837952811

95 % UCL (Assuming Normal Data)

Student's-t	484.5322079

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	634.5417411
Modified-t	509.5269324

95 % Non-parametric UCL

CLT	474.2983898
Jackknife	484.5322079
Standard Bootstrap	468.9677144
Bootstrap-t	2422.397336
Chebyshev (Mean, Std)	894.9524411

Summary Statistics for	ln(Toluene)
Minimum	-0.510825624
Maximum	8.268731832
Mean	2.949201472
Standard Deviation	2.207749822
Variance	4.874159277
Shapiro-Wilk Test Statisitic	0.959570914
Shapiro-Wilk 5% Critical Valu	0.918

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	218.3897063
MLE Standard Deviation	2488.723775
MLE Coefficient of Variation	11.39579249
MLE Skewness	1514.09156
MLE Median	19.09070318
MLE 80% Quantile	123.3159883
MLE 90% Quantile	325.7597001
MLE 95% Quantile	721.2241158
MLE 99% Quantile	3243.562553
MVU Estimate of Median	17.31112488
MVU Estimate of Mean	166.4558528
MVU Estimate of Std. Dev.	773.1857781
MVU Estimate of SE of Mean	96.08688786

UCL Assuming Lognormal Distribution

95% H-UCL	1551.910354
95% Chebyshev (MVUE) UCl	585.2888868
99% Chebyshev (MVUE) UCl	1122.508316

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Tetrachloroethene
Number of Samples	25
Minimum	1.5
Maximum	570
Mean	48.344
Median	2.9
Standard Deviation	113.1090001
Variance	12793.6459
Coefficient of Variation	2.339669868
Skewness	4.409020944

Shapiro-Wilk Test Statisitic	0.415316506
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	87.04722744

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	106.8682747
Modified-t	90.37189378

95 % Non-parametric UCL

CLT	85.55354983
Jackknife	87.04722744
Standard Bootstrap	84.90531434
Bootstrap-t	166.8638596
Chebyshev (Mean, Std)	146.9501402

From File

Summary Statistics for	Ethylbenzene
Number of Samples	25
Minimum	0.7
Maximum	570
Mean	94.2
Median	45
Standard Deviation	160.7569853
Variance	25842.80833
Coefficient of Variation	1.706549738
Skewness	2.161672401

Shapiro-Wilk Test Statisitic	0.621432245
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	149.2072422

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	161.9368618
Modified-t	151.5239352

95 % Non-parametric UCL

CLT	147.0843421
Jackknife	149.2072422
Standard Bootstrap	146.6341358
Bootstrap-t	183.9736377
Chebyshev (Mean, Std)	234.3446907

From File

Summary Statistics for	Isopropylbenzene
Number of Samples	17
Minimum	1.8
Maximum	120
Mean	39.16470588
Median	46
Standard Deviation	36.3496895
Variance	1321.299926
Coefficient of Variation	0.928123643
Skewness	0.50616694

Shapiro-Wilk Test Statisitic	0.85925519
Shapiro-Wilk 5% Critical Valu	0.892

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	54.55658034

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	54.82233881
Modified-t	54.7369628

95 % Non-parametric UCL

CLT	53.66589117
Jackknife	54.55658034
Standard Bootstrap	53.016323
Bootstrap-t	56.22502947
Chebyshev (Mean, Std)	77.59317159

From File

Summary Statistics for	1,3-Dichlorobenze
Number of Samples	25
Minimum	2
Maximum	402
Mean	149.308
Median	61
Standard Deviation	163.3075037
Variance	26669.34077
Coefficient of Variation	1.093762583
Skewness	0.738985394

Shapiro-Wilk Test Statisitic	0.73293084
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	205.1879694

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	208.1894006
Modified-t	205.9925151

95 % Non-parametric UCL

CLT	203.031388
Jackknife	205.1879694
Standard Bootstrap	202.2582714
Bootstrap-t	210.4268145
Chebyshev (Mean, Std)	291.6761811

From File

Summary Statistics for	1,4-Dichlorobenze
Number of Samples	25
Minimum	1.6
Maximum	640
Mean	169.74
Median	61
Standard Deviation	190.64795
Variance	36346.64083
Coefficient of Variation	1.123176328
Skewness	0.883259559

Shapiro-Wilk Test Statisitic	0.770339015
Shapiro-Wilk 5% Critical Valu	0.918

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	234.9752241

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	239.65475
Modified-t	236.0978349

95 % Non-parametric UCL

CLT	232.4575944
Jackknife	234.9752241
Standard Bootstrap	232.6206022
Bootstrap-t	249.99884
Chebyshev (Mean, Std)	335.9430296

From File		From File	
Summary Statistics for	2-Methylnaphthale	Summary Statistics for	Acenaphthylene
Number of Samples	24	Number of Samples	24
Minimum	58	Minimum	2.9
Maximum	20000	Maximum	2300
Mean	1931	Mean	480.0791667
Median	392	Median	358
Standard Deviation	4594.587695	Standard Deviation	596.1823933
Variance	21110236.09	Variance	355433.4461
Coefficient of Variation	2.379382545	Coefficient of Variation	1.241841835
Skewness	3.23263265	Skewness	2.453836972
Shapiro-Wilk Test Statisitic	0.442307789	Shapiro-Wilk Test Statisitic	0.626833392
Shapiro-Wilk 5% Critical Valu	0.916	Shapiro-Wilk 5% Critical Valu	0.916
Data not Normal at 5% Significance Level		Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL		Data not Lognormal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)		95 % UCL (Assuming Normal Data)	
Student's-t	3538.38205	Student's-t	688.6491061
95 % UCL (Adjusted for Skewness)		95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	4134.912489	Adjusted-CLT	745.3819347
Modified-t	3641.525204	Modified-t	698.8083727
95 % Non-parametric UCL		95 % Non-parametric UCL	
CLT	3473.652763	CLT	680.2499931
Jackknife	3538.38205	Jackknife	688.6491061
Standard Bootstrap	3434.686436	Standard Bootstrap	672.3490461
Bootstrap-t	5407.449632	Bootstrap-t	914.4355535
Chebyshev (Mean, Std)	6019.064363	Chebyshev (Mean, Std)	1010.536339

From File

Summary Statistics for	Dibenzofuran
Number of Samples	24
Minimum	58
Maximum	4600
Mean	852.5
Median	397
Standard Deviation	1038.485184
Variance	1078451.478
Coefficient of Variation	1.218164439
Skewness	2.474572826

95 % UCL (Assuming Normal Data)

Student's-t	1215.806254

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1315.587418
Modified-t	1233.652137

95 % Non-parametric UCL

CLT	1201.175909
Jackknife	1215.806254
Standard Bootstrap	1189.589578
Bootstrap-t	1505.078907
Chebyshev (Mean, Std)	1776.498965

Summary Statistics for	ln(Dibenzofuran)
Minimum	4.060443011
Maximum	8.433811582
Mean	6.207838936
Standard Deviation	1.07362815
Variance	1.152677405
Shapiro-Wilk Test Statisitic	0.955337682
Shapiro-Wilk 5% Critical Valu	0.916

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	883.7530238
MLE Standard Deviation	1300.847227
MLE Coefficient of Variation	1.47195788
MLE Skewness	7.6051059
MLE Median	496.6268486
MLE 80% Quantile	1230.350938
MLE 90% Quantile	1973.27743
MLE 95% Quantile	2904.327785
MLE 99% Quantile	6033.593285
MVU Estimate of Median	484.8316425
MVU Estimate of Mean	852.8486182
MVU Estimate of Std. Dev.	1108.811693
MVU Estimate of SE of Mean	214.61952

UCL Assuming Lognormal Distribution

95% H-UCL	1588.418065
95% Chebyshev (MVUE) UCl	1788.353417
99% Chebyshev (MVUE) UCl	2988.28588

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Fluorene
Number of Samples	24
Minimum	13
Maximum	9800
Mean	1201.542
Median	426
Standard Deviation	2002.421
Variance	4009689
Coefficient of Variation	1.666543
Skewness	3.732093

95 % UCL (Assuming Normal Data)	
Student's-t	1902.074

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	2206.582
Modified-t	1953.971

95 % Non-parametric UCL	
CLT	1873.863
Jackknife	1902.074
Standard Bootstrap	1849.74
Bootstrap-t	2776.144
Chebyshev (Mean, Std)	2983.209

Summary Statistics for	ln(Fluorene)
Minimum	2.564949357
Maximum	9.190137665
Mean	6.216990049
Standard Deviation	1.491352644
Variance	2.22413271
Shapiro-Wilk Test Statisitic	0.936251372
Shapiro-Wilk 5% Critical Valu	0.916

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	1523.943106
MLE Standard Deviation	4375.988985
MLE Coefficient of Variation	2.871491046
MLE Skewness	32.29124008
MLE Median	501.1923947
MLE 80% Quantile	1767.255458
MLE 90% Quantile	3406.287259
MLE 95% Quantile	5827.044178
MLE 99% Quantile	16088.76208
MVU Estimate of Median	478.4576369
MVU Estimate of Mean	1396.177008
MVU Estimate of Std. Dev.	2976.038159
MVU Estimate of SE of Mean	520.9171199

UCL Assuming Lognormal Distribution	
95% H-UCL	4157.539743
95% Chebyshev (MVUE) UCl	3666.802092
99% Chebyshev (MVUE) UCl	6579.236909

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

Chemical of Potential Concern	Max. Conc.	95% UCL (Distribution) (1)		Value	Statistic (2)		Rationale (3)	Description	Mean
Naphthalene	27000	3160.02986	(NP)	3160.029860	95% UCL-NP		(d)	Chebyshev	1100.550806
p-Isopropyltoluene	1850	525.8516822	(NP)	525.851682	95% UCL-NP		(d)	Chebyshev	157.9230769
Chloroethane	2595	391.3336321	(NP)	391.333632	95% UCL-NP		(d)	Chebyshev	136.5734694
1,1-Dichloroethene	2595	387.2015904	(NP)	387.201590	95% UCL-NP		(d)	Chebyshev	116.7709302
trans-1,2-Dichloroethene	2400	314.1728566	(NP)	314.172857	95% UCL-NP		(d)	Chebyshev	107.5830189
1,1-Dichloroethane	2595	325.558382	(NP)	325.558382	95% UCL-NP		(d)	Bootstrap-t	112.9008772
cis-1,2-Dichloroethene	10000	17584.49245	(NP)	10000.000000	Max		(d & e)	Bootstrap-t	381.5142857
Methyl cyclohexane	1.1	N/A	(<4)	1.100000	Max		(a)	Too Few OI	1.075
Chlorobenzene	2595	456.3531924	(NP)	456.353192	95% UCL-NP		(d)	Chebyshev	154.2813953
Phenanthrene	9000	1720.448502	(NP)	1720.448502	95% UCL-NP		(d)	Bootstrap-t	1120.012121
C5-C8 Aliphatic	1000	N/A	(<4)	1000.000000	Max		(a)	Too Few OI	1000
C9-C12 Aliphatic	1000	N/A	(<4)	1000.000000	Max		(a)	Too Few OI	1000
C9-C18 Aliphatic	1620	N/A	(<4)	1620.000000	Max		(a)	Too Few OI	1612.5
C11-C22 Aromatic	72000000	5438767.24	(NP)	5438767.240000	95% UCL-NP		(d)	Bootstrap-t	2747185.051
1,2,4-Trimethylbenzene	45000.0	9374.0	(NP)	9374.006001	95% UCL-NP		(d)	hev (Mean,	1845.230769
1,3,5-Trimethylbenzene	19000.0	4004.5	(NP)	4004.545785	95% UCL-NP		(d)	hev (Mean,	827.9230769
1,2-Dichloroethene (total)	1557	1192.429909	(NP)	1192.429909	95% UCL-NP	(d)		Chebyshev	224.0928571
1,2-Dichlorobenzene	12000	2230.695442	(NP)	2230.695442	95% UCL-NP	(d)		Chebyshev	635.5471429
p-Chlorotoluene	1850.0	519.7	(NP)	519.7051855	95% UCL-NP		(d)	hev (Mean,	151.1923077
Chloromethane	3750.0	642.0	(NP)	642.0209626	95% UCL-NP		(d)	rap-t	302.1534884
Vinyl chloride	1300.0	248.2	(NP)	248.2239606	95% UCL-NP		(d)	rap-t	134.6653061
Methylene chloride	20761.0	2012.1	(NP)	2012.112481	95% UCL-NP		(d)	hev (Mean,	498.6125
Benzene	2595.0	249.1	(NP)	249.1266245	95% UCL-NP		(d)	hev (Mean,	76.11911765
Trichloroethene	2076.0	223.4	(NP)	223.367367	95% UCL-NP		(d)	rap-t	101.6955882
Toluene	12000.0	855.5	(NP)	855.4920981	95% UCL-NP		(d)	hev (Mean,	225.0988372
Tetrachloroethene	2595.0	302.2	(NP)	302.2415132	95% UCL-NP		(d)	hev (Mean,	96.15263158
Ethylbenzene	7600.0	670.4	(NP)	670.4362644	95% UCL-NP		(d)	hev (Mean,	173.5176471
Isopropylbenzene	1850.0	483.7	(NP)	483.7079996	95% UCL-NP		(d)	hev (Mean,	140.4696429
1,3-Dichlorobenzene	4681.5	1065.8	(NP)	1065.805042	95% UCL-NP		(d)	rap-t	391.8328571
1,4-Dichlorobenzene	4681.5	698.7	(NP)	698.6765081	95% UCL-NP		(d)	rap-t	302.1534884
n-Butylbenzene	1850	535.7338728	(NP)	535.7339	95% UCL-NP		(d)	Chebyshev	165.6153846
Acetone	12975	1273.655884	(NP)	1273.6559	95% UCL-NP		(d)	Chebyshev	396.3507353
1,1,1-Trichloroethane	2595	372.9861717	(NP)	373	95% UCL-NP		(d)	Chebyshev	118.4929825
2-Methylnaphthalene	2200.0	850.7	(NP)	851	95% UCL-NP		(d)	rap-t	498.5227273
Acenaphthylene	8500.0	1388.3	(NP)	1388.342243	95% UCL-NP		(d)	rap-t	818.9274194
Dibenzofuran	4681.5	1537.0	(NP)	1536.950111	95% UCL-NP		(d)	Bootstrap-t	535.7
Fluorene	4681.5	909.5	(NP)	909.5358507	95% UCL-NP		(d)	Bootstrap-t	443.8545977
1,2,4-Trimethylbenzene	45000	9374.006001	(NP)	9374.006001	95% UCL-NP	(d)		Chebyshev	1845.230769
1,3,5-Trimethylbenzene	19000	4004.545785	(NP)	4004.545785	95% UCL-NP	(d)		Chebyshev	827.9230769
p-Chlorotoluene	1850	519.7051855	(NP)	519.7051855	95% UCL-NP	(d)		Chebyshev	151.1923077
Chloromethane	3750	642.0209626	(NP)	642.0209626	95% UCL-NP	(d)		Bootstrap-t	302.1534884
Vinyl chloride	1300	248.2239606	(NP)	248.2239606	95% UCL-NP	(d)		Bootstrap-t	134.6653061
Methylene chloride	20761	2012.112481	(NP)	2012.112481	95% UCL-NP	(d)		Chebyshev	498.6125
Benzene	2595	249.1266245	(NP)	249.1266245	95% UCL-NP	(d)		Chebyshev	76.11911765
Trichloroethene	2076	223.367367	(NP)	223.367367	95% UCL-NP	(d)		Bootstrap-t	101.6955882
Toluene	12000	855.4920981	(NP)	855.4920981	95% UCL-NP	(d)		Chebyshev	225.0988372
Tetrachloroethene	2595	302.2415132	(NP)	302.2415132	95% UCL-NP	(d)		Chebyshev	96.15263158
Ethylbenzene	7600	670.4362644	(NP)	670.4362644	95% UCL-NP	(d)		Chebyshev	173.5176471
Isopropylbenzene	1850	483.7079996	(NP)	483.7079996	95% UCL-NP	(d)		Chebyshev	140.4696429
1,3-Dichlorobenzene	4681.5	1065.805042	(NP)	1065.805042	95% UCL-NP	(d)		Bootstrap-t	391.8328571
1,4-Dichlorobenzene	4681.5	698.6765081	(NP)	698.6765081	95% UCL-NP	(d)		Bootstrap-t	302.1534884
2-Methylnaphthalene	2200	850.7112553	(NP)	850.7112553	95% UCL-NP	(d)		Bootstrap-t	498.5227273
Acenaphthylene	8500	1388.342243	(NP)	1388.342243	95% UCL-NP	(d)		Bootstrap-t	818.9274194
Dibenzofuran	4681.5	1536.950111	(NP)	1536.950111	95% UCL-NP	(d)		Bootstrap-t	535.7
Fluorene	4681.5	909.5358507	(NP)	909.5358507	95% UCL-NP	(d)		Bootstrap-t	443.8545977

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

From File

Summary Statistics for	Naphthalene
Number of Samples	62
Minimum	1.35
Maximum	27000
Mean	1100.550806
Median	165
Standard Deviation	3720.286818
Variance	13840534.01
Coefficient of Variation	3.380386254
Skewness	5.98282016

Lilliefors Test Statisitic	0.383820817
Lilliefors 5% Critical Value	0.112522113

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	1889.690761

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2261.299521
Modified-t	1949.523575

95 % Non-parametric UCL

CLT	1877.706147
Jackknife	1889.690761
Standard Bootstrap	1863.257568
Bootstrap-t	3286.561184
Chebyshev (Mean, Std)	3160.02986

From File

Summary Statistics for	p-Isopropyltoluene
Number of Samples	26
Minimum	12.5
Maximum	1850
Mean	157.9230769
Median	12.5
Standard Deviation	430.4011546
Variance	185245.1538
Coefficient of Variation	2.725384807
Skewness	3.326963443

Shapiro-Wilk Test Statisitic	0.396576409
Shapiro-Wilk 5% Critical V	0.92

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	302.1048404

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	355.6104554
Modified-t	311.2838719

95 % Non-parametric UCL

CLT	296.7628869
Jackknife	302.1048404
Standard Bootstrap	295.7259043
Bootstrap-t	725.6154363
Chebyshev (Mean, Std)	525.8516822

From File

Summary Statistics for	Chloroethane
Number of Samples	49
Minimum	1.05
Maximum	2595
Mean	136.5734694
Median	5
Standard Deviation	409.1219279
Variance	167380.7519
Coefficient of Variation	2.995617888
Skewness	4.980177895

Shapiro-Wilk Test Statisitic	0.381966404
Shapiro-Wilk 5% Critical V	0.947

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	234.6004819

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	277.139144
Modified-t	241.530754

95 % Non-parametric UCL

CLT	232.7085676
Jackknife	234.6004819
Standard Bootstrap	235.1290646
Bootstrap-t	393.6066568
Chebyshev (Mean, Std)	391.3336321

From File

Summary Statistics for	1,1-Dichloroethene
Number of Samples	43
Minimum	0.8
Maximum	2595
Mean	116.7709302
Median	3.75
Standard Deviation	406.8303606
Variance	165510.9423
Coefficient of Variation	3.484003765
Skewness	5.683773663

Shapiro-Wilk Test Statisitic	0.314460855
Shapiro-Wilk 5% Critical V:	0.943

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	221.1210017

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	276.2789064
Modified-t	230.0835276

95 % Non-parametric UCL

CLT	218.8193737
Jackknife	221.1210017
Standard Bootstrap	215.9892038
Bootstrap-t	481.4252162
Chebyshev (Mean, Std)	387.2015904

From File

Summary Statistics for	trans-1,2-Dichloroet
Number of Samples	53
Minimum	1.05
Maximum	2400
Mean	107.5830189
Median	3.75
Standard Deviation	345.0405114
Variance	119052.9545
Coefficient of Variation	3.207202354
Skewness	5.929351307

Lilliefors Test Statisitic	0.378753976
Lilliefors 5% Critical Value	0.12170146

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	186.9548303

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	226.7867875
Modified-t	193.3883725

95 % Non-parametric UCL

CLT	185.5407895
Jackknife	186.9548303
Standard Bootstrap	185.3847102
Bootstrap-t	320.5852683
Chebyshev (Mean, Std)	314.1728566

From File

Summary Statistics for	1,1-Dichloroethane
Number of Samples	57
Minimum	1.05
Maximum	2595
Mean	112.9008772
Median	3.75
Standard Deviation	374.117436
Variance	139963.8559
Coefficient of Variation	3.313680507
Skewness	5.615407221

Lilliefors Test Statisitic	0.38285528
Lilliefors 5% Critical Value	0.117353567

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	195.77947

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	233.7901434
Modified-t	201.9222237

95 % Non-parametric UCL

CLT	194.4084158
Jackknife	195.77947
Standard Bootstrap	192.7466056
Bootstrap-t	325.558382
Chebyshev (Mean, Std)	328.8976796

From File

Summary Statistics for	cis-1,2-Dichloroethe
Number of Samples	28
Minimum	1.05
Maximum	10000
Mean	381.5142857
Median	2.5
Standard Deviation	1886.063586
Variance	3557235.849
Coefficient of Variation	4.943625065
Skewness	5.28239048

Shapiro-Wilk Test Statisitic	0.209627379
Shapiro-Wilk 5% Critical V	0.924

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	988.6215588

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1347.991064
Modified-t	1047.92468

95 % Non-parametric UCL

CLT	967.7936005
Jackknife	988.6215588
Standard Bootstrap	986.5682825
Bootstrap-t	17584.49245
Chebyshev (Mean, Std)	1935.167597

From File

Summary Statistics for	Methyl cyclohexane
Number of Samples	2
Minimum	1.05
Maximum	1.1
Mean	1.075
Median	1.075

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	Chlorobenzene
Number of Samples	43
Minimum	1.05
Maximum	2595
Mean	154.2813953
Median	9
Standard Deviation	454.4306406
Variance	206507.2071
Coefficient of Variation	2.945466235
Skewness	4.365039046

Shapiro-Wilk Test Statisitic	0.388936439
Shapiro-Wilk 5% Critical V:	0.943

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	270.8407144

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	317.5607975
Modified-t	278.5291156

95 % Non-parametric UCL

CLT	268.2697896
Jackknife	270.8407144
Standard Bootstrap	269.4822051
Bootstrap-t	496.9639025
Chebyshev (Mean, Std)	456.3531924

From File

Summary Statistics for	Phenanthrene
Number of Samples	66
Minimum	1.3
Maximum	9000
Mean	1120.012121
Median	198
Standard Deviation	2113.110845
Variance	4465237.445
Coefficient of Variation	1.886685693
Skewness	2.620163175

Lilliefors Test Statisitic	0.300915079
Lilliefors 5% Critical Value	0.109059061

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	1554.034199

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1637.485316
Modified-t	1568.015752

95 % Non-parametric UCL

CLT	1547.848361
Jackknife	1554.034199
Standard Bootstrap	1548.740588
Bootstrap-t	1720.448502
Chebyshev (Mean, Std)	2253.787735

From File

Summary Statistics for	C5-C8 Aliphatic
Number of Samples	2
Minimum	1000
Maximum	1000
Mean	1000
Median	1000

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C9-C12 Aliphatic
Number of Samples	2
Minimum	1000
Maximum	1000
Mean	1000
Median	1000

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C9-C18 Aliphatic
Number of Samples	2
Minimum	1605
Maximum	1620
Mean	1612.5
Median	1612.5

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C11-C22 Aromatic
Number of Samples	98
Minimum	4545
Maximum	72000000
Mean	2747185.051
Median	145000
Standard Deviation	8330944.12
Variance	6.94E+13
Coefficient of Variation	3.032538386
Skewness	6.408233996

Lilliefors Test Statisitic	0.370998096
Lilliefors 5% Critical Value	0.089499515

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	4144763.179

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4713501.324
Modified-t	4235556.783

95 % Non-parametric UCL

CLT	4131415.635
Jackknife	4144763.179
Standard Bootstrap	4055869.319
Bootstrap-t	5438767.24
Chebyshev (Mean, Std)	6415427.093

From File

Summary Statistics for	1,2,4-Trimethylbenz
Number of Samples	26
Minimum	12.5
Maximum	45000
Mean	1845.230769
Median	12.5
Standard Deviation	8807.125909
Variance	77565466.78
Coefficient of Variation	4.772912991
Skewness	5.08928174

Shapiro-Wilk Test Statisitic	0.21761612
Shapiro-Wilk 5% Critical V.	0.92

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	4795.56427

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	6528.288545
Modified-t	5082.88443

95 % Non-parametric UCL

CLT	4686.254022
Jackknife	4795.56427
Standard Bootstrap	4696.431075
Bootstrap-t	90874.57989
Chebyshev (Mean, Std)	9374.006001

From File

Summary Statistics for	1,3,5-Trimethylbenz
Number of Samples	26
Minimum	12.5
Maximum	19000
Mean	827.9230769
Median	12.5
Standard Deviation	3715.998325
Variance	13808643.55
Coefficient of Variation	4.48833766
Skewness	5.057654298

Shapiro-Wilk Test Statisitic	0.233141206
Shapiro-Wilk 5% Critical V	0.92

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	2072.759867

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2799.019739
Modified-t	2193.235732

95 % Non-parametric UCL

CLT	2026.638499
Jackknife	2072.759867
Standard Bootstrap	2032.455193
Bootstrap-t	24169.65092
Chebyshev (Mean, Std)	4004.545785

From File

Summary Statistics for	p-Chlorotoluene
Number of Samples	26
Minimum	12.5
Maximum	1850
Mean	151.1923077
Median	12.5
Standard Deviation	431.0846338
Variance	185833.9615
Coefficient of Variation	2.851233905
Skewness	3.360601645

Shapiro-Wilk Test Statisitic	0.373663962
Shapiro-Wilk 5% Critical V	0.92

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	295.6030326

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	349.7895545
Modified-t	304.8895949

95 % Non-parametric UCL

CLT	290.2525961
Jackknife	295.6030326
Standard Bootstrap	285.265298
Bootstrap-t	686.6649082
Chebyshev (Mean, Std)	519.7051855

From File

Summary Statistics for	Chloromethane
Number of Samples	43
Minimum	1.05
Maximum	3750
Mean	302.1534884
Median	25
Standard Deviation	779.2286287
Variance	607197.2558
Coefficient of Variation	2.57891654
Skewness	3.357669293

Shapiro-Wilk Test Statisitic	0.43565125
Shapiro-Wilk 5% Critical V:	0.943

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	502.0219617

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	562.6286853
Modified-t	512.1630161

95 % Non-parametric UCL	
CLT	497.6135041
Jackknife	502.0219617
Standard Bootstrap	494.5862088
Bootstrap-t	642.0209626
Chebyshev (Mean, Std)	820.1269065

From File

Summary Statistics for	Vinyl chloride
Number of Samples	49
Minimum	1.05
Maximum	1300
Mean	134.6653061
Median	9
Standard Deviation	315.5984285
Variance	99602.36804
Coefficient of Variation	2.343576364
Skewness	2.895643404

Shapiro-Wilk Test Statisitic	0.474209391
Shapiro-Wilk 5% Critical V.	0.947

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	210.2837685

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	228.7523618
Modified-t	213.3921376

95 % Non-parametric UCL

CLT	208.8243376
Jackknife	210.2837685
Standard Bootstrap	208.6108169
Bootstrap-t	248.2239606
Chebyshev (Mean, Std)	331.1883999

From File

Summary Statistics for	Methylene chloride
Number of Samples	60
Minimum	2.5
Maximum	20761
Mean	498.6125
Median	12.5
Standard Deviation	2689.560045
Variance	7233733.238
Coefficient of Variation	5.394088687
Skewness	7.49778638

Lilliefors Test Statisitic	0.433127524
Lilliefors 5% Critical Value	0.114382108

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	1078.850484

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1428.86295
Modified-t	1134.866447

95 % Non-parametric UCL

CLT	1069.739743
Jackknife	1078.850484
Standard Bootstrap	1086.840083
Bootstrap-t	4365.607253
Chebyshev (Mean, Std)	2012.112481

From File

Summary Statistics for	Benzene
Number of Samples	68
Minimum	0.5
Maximum	2595
Mean	76.11911765
Median	3.125
Standard Deviation	327.2974363
Variance	107123.6118
Coefficient of Variation	4.299805967
Skewness	7.093015517

Lilliefors Test Statisitic	0.414696825
Lilliefors 5% Critical Value	0.107443282

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	142.3197684

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	177.8835932
Modified-t	148.0097826

95 % Non-parametric UCL

CLT	141.4044177
Jackknife	142.3197684
Standard Bootstrap	140.1165364
Bootstrap-t	304.1679936
Chebyshev (Mean, Std)	249.1266245

From File

Summary Statistics for	Trichloroethene
Number of Samples	68
Minimum	1.25
Maximum	2076
Mean	101.6955882
Median	5
Standard Deviation	336.5550997
Variance	113269.3351
Coefficient of Variation	3.30943658
Skewness	4.415597381

Lilliefors Test Statisitic	0.419426189
Lilliefors 5% Critical Value	0.107443282

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	169.7687357

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	192.179121
Modified-t	173.4111176

95 % Non-parametric UCL

CLT	168.827494
Jackknife	169.7687357
Standard Bootstrap	169.8379496
Bootstrap-t	223.367367
Chebyshev (Mean, Std)	279.5966417

From File

Summary Statistics for	Toluene
Number of Samples	86
Minimum	0.6
Maximum	12000
Mean	225.0988372
Median	5
Standard Deviation	1341.170484
Variance	1798738.266
Coefficient of Variation	5.958140434
Skewness	8.283777812

Lilliefors Test Statisitic	0.44835233
Lilliefors 5% Critical Value	0.095539837

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	465.6022821

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	601.0177206
Modified-t	487.1332091

95 % Non-parametric UCL

CLT	462.9810767
Jackknife	465.6022821
Standard Bootstrap	456.6442284
Bootstrap-t	1530.34868
Chebyshev (Mean, Std)	855.4920981

From File

Summary Statistics for	Tetrachloroethene
Number of Samples	57
Minimum	1.2
Maximum	2595
Mean	96.15263158
Median	3.75
Standard Deviation	356.9564138
Variance	127417.8814
Coefficient of Variation	3.712393597
Skewness	6.412144556

Lilliefors Test Statisitic	0.395117261
Lilliefors 5% Critical Value	0.117353567

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	175.2295268

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	216.827959
Modified-t	181.9220886

95 % Non-parametric UCL

CLT	173.9213638
Jackknife	175.2295268
Standard Bootstrap	170.1551603
Bootstrap-t	352.7500773
Chebyshev (Mean, Std)	302.2415132

From File

Summary Statistics for	Ethylbenzene
Number of Samples	68
Minimum	1.05
Maximum	7600
Mean	173.5176471
Median	4.375
Standard Deviation	940.0759105
Variance	883742.7174
Coefficient of Variation	5.417753908
Skewness	7.630753323

Lilliefors Test Statisitic	0.436449836
Lilliefors 5% Critical Value	0.107443282

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)	
Student's-t	363.6616267

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	473.7527452
Modified-t	381.2437037

95 % Non-parametric UCL	
CLT	361.032522
Jackknife	363.6616267
Standard Bootstrap	359.9894275
Bootstrap-t	1438.06087
Chebyshev (Mean, Std)	670.4362644

From File

Summary Statistics for	Isopropylbenzene
Number of Samples	28
Minimum	1.05
Maximum	1850
Mean	140.4696429
Median	12.5
Standard Deviation	416.6755615
Variance	173618.5236
Coefficient of Variation	2.966303274
Skewness	3.504813846

Shapiro-Wilk Test Statisitic	0.362791885
Shapiro-Wilk 5% Critical V	0.924

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	274.5938399

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	325.7219851
Modified-t	283.2865201

95 % Non-parametric UCL

CLT	269.9924567
Jackknife	274.5938399
Standard Bootstrap	269.2557633
Bootstrap-t	638.7902935
Chebyshev (Mean, Std)	483.7079996

From File

Summary Statistics for	1,3-Dichlorobenzen
Number of Samples	35
Minimum	1.05
Maximum	4681.5
Mean	391.8328571
Median	25
Standard Deviation	1058.378126
Variance	1120164.257
Coefficient of Variation	2.701095904
Skewness	3.292313379

Shapiro-Wilk Test Statisitic	0.406320334
Shapiro-Wilk 5% Critical V.	0.934

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	694.3367192

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	792.4734245
Modified-t	710.9296357

95 % Non-parametric UCL

CLT	686.0947947
Jackknife	694.3367192
Standard Bootstrap	685.5808014
Bootstrap-t	1065.805042
Chebyshev (Mean, Std)	1171.63358

From File

Summary Statistics for	Chloromethane
Number of Samples	43
Minimum	1.05
Maximum	3750
Mean	302.1534884
Median	25
Standard Deviation	779.2286287
Variance	607197.2558
Coefficient of Variation	2.57891654
Skewness	3.357669293

Shapiro-Wilk Test Statisitic	0.43565125
Shapiro-Wilk 5% Critical V:	0.943

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	502.0219617

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	562.6286853
Modified-t	512.1630161

95 % Non-parametric UCL

CLT	497.6135041
Jackknife	502.0219617
Standard Bootstrap	494.2303472
Bootstrap-t	698.6765081
Chebyshev (Mean, Std)	820.1269065

From File

Summary Statistics for	2-Methylnaphthalen
Number of Samples	22
Minimum	35
Maximum	2200
Mean	498.5227273
Median	167.5
Standard Deviation	670.0549458
Variance	448973.6304
Coefficient of Variation	1.34408104
Skewness	1.72713837

Shapiro-Wilk Test Statisitic	0.617986912
Shapiro-Wilk 5% Critical V	0.911

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	744.3414698

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	789.7078882
Modified-t	753.1087244

95 % Non-parametric UCL

CLT	733.500257
Jackknife	744.3414698
Standard Bootstrap	727.6914734
Bootstrap-t	850.7112553
Chebyshev (Mean, Std)	1121.218442

From File

Summary Statistics for	Acenaphthylene
Number of Samples	62
Minimum	19
Maximum	8500
Mean	818.9274194
Median	165
Standard Deviation	1708.049465
Variance	2917432.974
Coefficient of Variation	2.08571532
Skewness	3.418942517

Lilliefors Test Statisitic	0.328337152
Lilliefors 5% Critical Value	0.112522113

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	1181.235527

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1276.375575
Modified-t	1196.933707

95 % Non-parametric UCL

CLT	1175.733179
Jackknife	1181.235527
Standard Bootstrap	1178.96924
Bootstrap-t	1388.342243
Chebyshev (Mean, Std)	1764.470671

From File

Summary Statistics for	Dibenzofuran
Number of Samples	20
Minimum	35
Maximum	4681.5
Mean	535.7
Median	165
Standard Deviation	1078.092021
Variance	1162282.405
Coefficient of Variation	2.012492105
Skewness	3.41159976

Shapiro-Wilk Test Statisitic	0.433490187
Shapiro-Wilk 5% Critical V.	0.905

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	952.5397425

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1128.723534
Modified-t	983.1898965

95 % Non-parametric UCL

CLT	932.2227331
Jackknife	952.5397425
Standard Bootstrap	907.5939664
Bootstrap-t	1536.950111
Chebyshev (Mean, Std)	1586.494121

From File

Summary Statistics for	Fluorene
Number of Samples	87
Minimum	0
Maximum	8500
Mean	443.8545977
Median	55
Standard Deviation	1405.330286
Variance	1974953.213
Coefficient of Variation	3.166195176
Skewness	4.866106348

Lilliefors Test Statisitic	0.411504273
Lilliefors 5% Critical Value	0.094989171

Data not Normal at 5% Significance Level
Data are Lognormal: Try Lognormal UCLs

95 % UCL (Assuming Normal Data)

Student's-t	694.3788056

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	775.6688825
Modified-t	707.4793547

95 % Non-parametric UCL

CLT	691.6801236
Jackknife	694.3788056
Standard Bootstrap	689.8159829
Bootstrap-t	909.5358507
Chebyshev (Mean, Std)	1100.59779

Chemical of Potential Concern	Max. Conc.	Description	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Mean
1,4-Dichlorobenzene	0.484	Student's-t	0.503342257	(N)	0.484000	Max	(b & e)	0.04
Benzene	0.32	Student's-t	0.281633317	(N)	0.281633	95% UCL-N	(b)	0.04
cis-1,2-Dichloroethene	29	Student's-t	25.8133439	(N)	25.813344	95% UCL-N	(b)	0.5
Trichloroethene	25	Student's-t	25.48230259	(N)	25.000000	Max	(b & e)	0.5
Vinyl chloride	0.24	Student's-t	0.232488658	(N)	0.232489	95% UCL-N	(b)	0.04
Naphthalene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	1.3185
Acenaphthene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	3.966666667
Phenanthrene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	2.833333333
Benzo(a)Anthracene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.338
Chrysene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.671666667
Benzo(b)Fluoranthene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.338333333
Benzo(k)Fluoranthene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.338
Benzo(a)Pyrene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.337
Indeno(1,2,3-cd)pyrene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.338
Dibenz(a,h) anthracene		Too Few Observations To Calculate UCLs	N/A	(<4)		Max	(a)	0.337666667
C9-C18 Allphatic	25	Too Few Observations To Calculate UCLs	N/A	(<4)	25.000000	Max	(a)	25
C11-C22 Aromatic	25	Too Few Observations To Calculate UCLs	N/A	(<4)	25.000000	Max	(a)	25
C5-C8 Aliphatic	25	Too Few Observations To Calculate UCLs	N/A	(<4)	25.000000	Max	(a)	25
C9-C10 Aromatic	25	Too Few Observations To Calculate UCLs	N/A	(<4)	25.000000	Max	(a)	25
1,1-Dichloroethene	0.194	Jackknife	0.169104486	(NP)	0.1691045	95% UCL-NP	(d)	0.0785
Chlorodibromomethane	1.03	Student's-t	0.900109759	(N)	0.9001098	95% UCL-N	(b)	0.35125
Chloroform	0.107	Student's-t	0.101687158	(N)	0.1016872	95% UCL-N	(b)	0.06425
Methyl tert-butyl ether	14	Student's-t	12.48835604	(N)	12.488356	95% UCL-N	(b)	5
Tetrachloroethene	0.5	Jackknife	0.527743947	(NP)	0.5	Max	(d & e)	0.4795
C9-C12 Aliphatic	25	Too Few Observations To Calculate UCLs	N/A	(<4)	25.000000	Max	(a)	25

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

From File

Summary Statistics for	1,4-Dichlorobenzene
Number of Samples	4
Minimum	0.04
Maximum	0.484
Mean	0.2385
Median	0.215
Standard Deviation	0.225075543
Variance	0.050659
Coefficient of Variation	0.943712968
Skewness	0.195253122

Shapiro-Wilk Test Statisitic	0.846994364
Shapiro-Wilk 5% Critical Valt	0.748

Data are Normal at 5% Significance Level
Recommended UCL to use Student's-t

95 % UCL (Assuming Normal Data)

Student's-t	0.503342257

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	0.435347584
Modified-t	0.505173369

95 % Non-parametric UCL

CLT	0.423608162
Jackknife	0.503342257
Standard Bootstrap	0.394106241
Bootstrap-t	5.202491645
Chebyshev (Mean, Std)	0.729040773

From File

Summary Statistics for	Benzene
Number of Samples	4
Minimum	0.04
Maximum	0.32
Mean	0.1275
Median	0.075
Standard Deviation	0.130989822
Variance	0.017158333
Coefficient of Variation	1.027371149
Skewness	1.772917098
Shapiro-Wilk Test Statisitic	0.783313096
Shapiro-Wilk 5% Critical Valt	0.748
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t
95 % UCL (Assuming Normal Data)	
Student's-t	0.281633317
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	0.297265915
Modified-t	0.291309737
95 % Non-parametric UCL	
CLT	0.235229542
Jackknife	0.281633317
Standard Bootstrap	0.217870157
Bootstrap-t	1.999268465
Chebyshev (Mean, Std)	0.412985697

From File

Summary Statistics for	cis-1,2-Dichloroethene
Number of Samples	4
Minimum	0.5
Maximum	29
Mean	11.375
Median	8
Standard Deviation	12.27039119
Variance	150.5625
Coefficient of Variation	1.078715709
Skewness	1.48384409
Shapiro-Wilk Test Statisitic	0.849215573
Shapiro-Wilk 5% Critical Valu	0.748
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t
95 % UCL (Assuming Normal Data)	
Student's-t	25.8133439
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	26.33020236
Modified-t	26.57198338
95 % Non-parametric UCL	
CLT	21.46649873
Jackknife	25.8133439
Standard Bootstrap	20.13243605
Bootstrap-t	1.#INF
Chebyshev (Mean, Std)	38.1176976

From File

Summary Statistics for	Trichloroethene
Number of Samples	4
Minimum	0.5
Maximum	25
Mean	11.875
Median	11
Standard Deviation	11.56413277
Variance	133.7291667
Coefficient of Variation	0.973821707
Skewness	0.228727759

Shapiro-Wilk Test Statisitic	0.91736041
Shapiro-Wilk 5% Critical Valt	0.748

Data are Normal at 5% Significance Level
Recommended UCL to use Student's-t

95 % UCL (Assuming Normal Data)

Student's-t	25.48230259

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	22.09221827
Modified-t	25.59251252

95 % Non-parametric UCL

CLT	21.38565287
Jackknife	25.48230259
Standard Bootstrap	20.0772465
Bootstrap-t	66.95658012
Chebyshev (Mean, Std)	37.07844305

From File

Summary Statistics for	Vinyl chloride	
Number of Samples		4
Minimum		0.04
Maximum		0.24
Mean		0.11825
Median		0.0965
Standard Deviation		0.097085443
Variance		0.009425583
Coefficient of Variation		0.821018549
Skewness		0.647232766
Shapiro-Wilk Test Statisitic		0.864946056
Shapiro-Wilk 5% Critical Valu		0.748
Data are Normal at 5% Significance Level		
Recommended UCL to use	Student's-t	
95 % UCL (Assuming Normal Data)		
Student's-t		0.232488658
95 % UCL (Adjusted for Skewness)		
Adjusted-CLT		0.214881201
Modified-t		0.235106861
95 % Non-parametric UCL		
CLT		0.198095672
Jackknife		0.232488658
Standard Bootstrap		0.187007876
Bootstrap-t	1.#INF	
Chebyshev (Mean, Std)		0.329842819

From File

Summary Statistics for	C9-C18 Aliphatic
Number of Samples	2
Minimum	25
Maximum	25
Mean	25
Median	25

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C11-C22 Aromatic
Number of Samples	2
Minimum	25
Maximum	25
Mean	25
Median	25

Too Few Observations To Calculate UCLs

C.8-9 Indoor Air Groundwater Aberjona Worker Runs

From File

Summary Statistics for	C5-C8 Aliphatic
Number of Samples	2
Minimum	25
Maximum	25
Mean	25
Median	25

Too Few Observations To Calculate UCLs

C.8-9 Indoor Air Groundwater Aberjona Worker Runs

From File

Summary Statistics for	C9-C10 Aromatic
Number of Samples	2
Minimum	25
Maximum	25
Mean	25
Median	25

Too Few Observations To Calculate UCLs

From File

Summary Statistics for	C9-C12 Aliphatic
Number of Samples	2
Minimum	25
Maximum	25
Mean	25
Median	25

Too Few Observations To Calculate UCLs

Chemical of Potential Concern	Max. Conc.	Description	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Mean
C9-C10 Aromatic	25		N/A	(<4)	25.000000	Max	(a)	25
C9-C12 Aliphatic	25		N/A	(<4)	25.000000	Max	(a)	25

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

C.8-10.2 Shallow GW Indoor Air Whitney Summary Table

Chemical of Potential Concern	Max. Conc.	Description	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Mean
C9-C10 Aromatic	100		N/A	(<4)	100.000000	Max	(a)	43.33333333
C9-C12 Aliphatic	50		N/A	(<4)	50.000000	Max	(a)	26.66666667

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

Chemical of Potential Concern	Max. Conc.	Description	95% UCL (Distribution) (1)		Value	Statistic (2)	Rationale (3)	Mean
C9-C10 Aromatic	200	Chebyshev (Mean, Std)	71.76967066	(NP)	71.769671	95% UCL-NP	(d)	21.72222222
C9-C12 Aliphatic	95.9	Chebyshev (Mean, Std)	33.01090701	(NP)	33.010907	95% UCL-NP	(d)	11.02222222

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.

C.8-10.3 Shallow GW Indoor Air Murphy Runs

From File

Summary Statistics for	C9-C10 Ar
Number of Samples	18
Minimum	5
Maximum	200
Mean	21.72222
Median	5
Standard Deviation	48.71261
Variance	2372.918
Coefficient of Variation	2.242524
Skewness	3.380081

Shapiro-Wilk Test Statisitic	0.405538
Shapiro-Wilk 5% Critical Value	0.897

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	41.69581

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	50.38198
Modified-t	43.22037

95 % Non-parametric UCL

CLT	40.60789
Jackknife	41.69581
Standard Bootstrap	39.97032
Bootstrap-t	212.9203
Chebyshev (Mean, Std)	71.76967

From File

Summary Statistics for	C9-C12 Aliphatic
Number of Samples	18
Minimum	5
Maximum	95.9
Mean	11.02222
Median	5
Standard Deviation	21.40221
Variance	458.0548
Coefficient of Variation	1.941733
Skewness	4.107187

Shapiro-Wilk Test Statisitic	0.317663
Shapiro-Wilk 5% Critical Value	0.897

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	19.79775

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	24.53785
Modified-t	20.61167

95 % Non-parametric UCL

CLT	19.31977
Jackknife	19.79775
Standard Bootstrap	18.94671
Bootstrap-t	109.153
Chebyshev (Mean, Std)	33.01091

Chemical of Potential Conc	Max. Conc.	95% UCL (Distribution)		Value	Statistic	Rationale	Descriptio	Mean
Naphthalene	28000	35280	(T)	28000	Max	(c & e)	99% Cheb	4530.5
Vinyl chloride	9500	11544	(T)	9500	Max	(c & e)	Chebyshev	1135.933
Trichloroethene	4750	2914	(T)	2914	95% UCL-T	(c)	99% Cheb	572.6
Ethylenedibromide	9500	17287	(T)	9500	Max	(c & e)	Chebyshev	1635.258
Ethylbenzene	11000	39930.35	(T)	11000	Max	(c & e)	99% Cheb	2276.84
Xylenes (total)	53000	251099.1	(T)	53000	Max	(c & e)	sd=3.9503	12026.63
2-Methylnaphthalene	24800	12285	(T)	12285	95% UCL-T	(c)	99% Cheb	2590.281
Benzo(a)Anthracene	5500	3989	(T)	3989	95% UCL-T	(c)	95% Cheb	1637.85
Benzo(b)Fluoranthene	5500	3699	(T)	3699	95% UCL-T	(c)	95% Cheb	1642.45
Benzo(a)Pyrene	5500	4228	(T)	4228	95% UCL-T	(c)	95% Cheb	1681.15
Indeno(1,2,3-cd)pyrene	5500	5225	(T)	5225	95% UCL-T	(d)	95% Cheb	1705.825
Dibenz(a,h) anthracene	5500	7781	(T)	5500	Max	(c & e)	95% Cheb	1298.363
Acetophenone	4950	3179.612	(N)	3179.612044	95% UCL-N	(b)	Student's-t	1651.667
C11-C22 Aromatic	97000000	20482736	(NP)	20482736	95% UCL-NP	(d)	Chebyshev	7239279
C19-C36 Aliphatic	19400000	9397194	(T)	9397194	95% UCL-T	(c)	99% Cheb	2618375
C9-C18 Aliphatic	2500000	1682269	(NP)	1682269	95% UCL-NP	(d)	Chebyshev	329655.6
Chromium (VI)	365750	53882.32	(NP)	53882	95% UCL-NP	(d)	Bootstrap-t	27174.03
Antimony	117000	165495	(T)	117000	Max	(c & e)	99% Cheb	25152
Arsenic	17000	11186	(N)	11186	95% UCL-N	(b)	Student's-t	9101.923
Barium	2600000	1128855	(T)	1128855	95% UCL-N	(b)	95% Cheb	486680
Cadmium	5225	2989	(N)	2989	95% UCL-N	(b)	Student's-t	2164.231
Chromium	66500000	12649285	(T)	12649285	95% UCL-T	(c)	95% H-UC	5319807
Lead	35515161	4040783	(T)	4040783	95% UCL-T	(c)	95% H-UC	2449710
Manganese	9397194	337570	(N)	337570	95% UCL-N	(b)	Student's-t	250040
Mercury	1008878	3039	(T)	3039	95% UCL-T	(c)	95% Cheb	1226.95
Vanadium	85723	55454	(N)	55454	95% UCL-N	(b)	Student's-t	40570
TEQ (no 170/193/180) Huma	165495	0.1841	(N)	0	95% UCL-N	(b)	Student's-t	0.111786
gamma-Chlordane	11186	1834	(T)	1834	95% UCL-T	(c)	99% Cheb	340.0936
PCBs	1128855	102883	(T)	102883	95% UCL-T	(c)	99% Cheb	9975
Aroclor 1254	220000	88343	(T)	88343	95% UCL-T	(c)	95% Cheb	13175.88
Aroclor 1260	12649285	46245.67	(NP)	46246	95% UCL-NP	(d)	Chebyshev	11277.29

(1) T - Transformed; N - Normal; NP - Non-parametric; <4 - sample size too small to calculate 95% UCL
(2) Statistics: Maximum Detected Value (Max); 95% UCL of Transformed Data (95% UCL - T); 95% of Normal Data (95% UCL - N); 95% of Non-parametric Data (95% UCL - NP).
(3) Rationale

(a) Due to small sample size (<4), the maximum detected concentration is used.
(b) Shapiro-Wilk W Test indicates data are normally distributed.
(c) Shapiro-Wilk W Test indicates data are log-normally distributed.
(d) Shapiro-Wilk W Test indicates data are neither normally nor log-normally distributed.
(e) Recommended UCL exceeds maximum detected concentration. Therefore, maximum concentration is used for EPC.
(f) Due to high standard deviation, the maximum concentration is used.

From File

Summary Statistics for	Naphthalene
Number of Samples	20
Minimum	41
Maximum	28000
Mean	4530.5
Median	582.5
Standard Deviation	8550.2962
Variance	73107565.11
Coefficient of Variation	1.887274296
Skewness	2.135228346

95 % UCL (Assuming Normal Data)

Student's-t	7836.43604

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	8650.687435
Modified-t	7988.57633

95 % Non-parametric UCL

CLT	7675.302811
Jackknife	7836.43604
Standard Bootstrap	7656.026836
Bootstrap-t	9744.055439
Chebyshev (Mean, Std)	12864.29786

99 % Non-parametric UCL

Chebyshev (Mean, Std)	23553.70812

Summary Statistics for	ln(Naphthalene)
Minimum	3.713572067
Maximum	10.23995979
Mean	6.61786903
Standard Deviation	2.10730003
Variance	4.440713418
Shapiro-Wilk Test Statisitic	0.931127251
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	6892.752243
MLE Standard Deviation	63111.20909
MLE Coefficient of Variation	9.156169679
MLE Skewness	795.080052
MLE Median	748.3486883
MLE 80% Quantile	4440.567914
MLE 90% Quantile	11223.32599
MLE 95% Quantile	23965.66787
MLE 99% Quantile	100654.476
MVU Estimate of Median	669.3162084
MVU Estimate of Mean	5191.916196
MVU Estimate of Std. Dev.	19572.59212
MVU Estimate of SE of Mean	3023.916229

UCL Assuming Lognormal Distribution

95% H-UCL	57832.98358
95% Chebyshev (MVUE) UCL	18372.86145
99% Chebyshev (MVUE) UCL	35279.50278

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Vinyl chloride
Number of Samples	9
Minimum	1.5
Maximum	9500
Mean	1135.933333
Median	48.5
Standard Deviation	3138.10347
Variance	9847693.39
Coefficient of Variation	2.76257715
Skewness	2.994206212

95 % UCL (Assuming Normal Data)

Student's-t	3081.084708

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	3972.051387
Modified-t	3255.087095

95 % Non-parametric UCL

CLT	2856.506959
Jackknife	3081.084708
Standard Bootstrap	2790.443432
Bootstrap-t	42058.53388
Chebyshev (Mean, Std)	5695.491967

99 % Non-parametric UCL

Chebyshev (Mean, Std)	11543.8451

Summary Statistics for	ln(Vinyl chloride)
Minimum	0.405465108
Maximum	9.159047078
Mean	3.908830433
Standard Deviation	2.750278345
Variance	7.564030975
Shapiro-Wilk Test Statisitic	0.938509178
Shapiro-Wilk 5% Critical Value	0.829

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2188.224844
MLE Standard Deviation	96047.86605
MLE Coefficient of Variation	43.89305162
MLE Skewness	84696.03157
MLE Median	49.84062593
MLE 80% Quantile	509.1871521
MLE 90% Quantile	1707.760439
MLE 95% Quantile	4596.444325
MLE 99% Quantile	29910.8887
MVU Estimate of Median	32.10708338
MVU Estimate of Mean	727.3375671
MVU Estimate of Std. Dev.	2571.882465
MVU Estimate of SE of Mean	598.7521903

UCL Assuming Lognormal Distribution

95% H-UCL	4627939.692
95% Chebyshev (MVUE) UCL	3337.237857
99% Chebyshev (MVUE) UCL	6684.84664

Recommended UCL to use:
Greater of
99 % Chebyshev (MVUE) UCL
99 % Chebyshev (Mean, Std)

From File

Summary Statistics for	Trichloroethene
Number of Samples	9
Minimum	1.5
Maximum	4750
Mean	572.6
Median	48.5
Standard Deviation	1567.265179
Variance	2456320.14
Coefficient of Variation	2.737103001
Skewness	2.994553793

95 % UCL (Assuming Normal Data)

Student's-t	1544.068291

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1989.109069
Modified-t	1630.980511

95 % Non-parametric UCL

CLT	1431.907272
Jackknife	1544.068291
Standard Bootstrap	1391.37792
Bootstrap-t	21145.18552
Chebyshev (Mean, Std)	2849.78351

99 % Non-parametric UCL

Chebyshev (Mean, Std)	5770.630544

Summary Statistics for	ln(Trichloroethene
Minimum	0.405465108
Maximum	8.465899897
Mean	3.603009765
Standard Deviation	2.457697601
Variance	6.040277498
Shapiro-Wilk Test Statisitic	0.930904681
Shapiro-Wilk 5% Critical Value	0.829

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	752.3100307
MLE Standard Deviation	15399.57814
MLE Coefficient of Variation	20.46972326
MLE Skewness	8638.419123
MLE Median	36.70855246
MLE 80% Quantile	292.8803717
MLE 90% Quantile	863.635826
MLE 95% Quantile	2092.097266
MLE 99% Quantile	11154.67961
MVU Estimate of Median	25.92611272
MVU Estimate of Mean	336.4357512
MVU Estimate of Std. Dev.	1028.307014
MVU Estimate of SE of Mean	259.0758321

UCL Assuming Lognormal Distribution

95% H-UCL	352891.2238
95% Chebyshev (MVUE) UCL	1465.721122
99% Chebyshev (MVUE) UCL	2914.207733

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Ethylenedibromid
Number of Samples	6
Minimum	2.05
Maximum	9500
Mean	1635.258333
Median	81.75
Standard Deviation	3853.238341
Variance	14847445.71
Coefficient of Variation	2.35634839
Skewness	2.448582015

95 % UCL (Assuming Normal Data)

Student's-t	4805.086308

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	5902.975036
Modified-t	5067.168811

95 % Non-parametric UCL

CLT	4222.741332
Jackknife	4805.086308
Standard Bootstrap	4014.176934
Bootstrap-t	153616.927
Chebyshev (Mean, Std)	8492.146215

99 % Non-parametric UCL

Chebyshev (Mean, Std)	17287.18646

Summary Statistics for	ln(Ethylenedibrom
Minimum	0.717839793
Maximum	9.159047078
Mean	4.396036495
Standard Deviation	2.779038142
Variance	7.723052994
Shapiro-Wilk Test Statisitic	0.933709118
Shapiro-Wilk 5% Critical Value	0.788

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	3856.68387
MLE Standard Deviation	183297.9383
MLE Coefficient of Variation	47.52734331
MLE Skewness	107499.6436
MLE Median	81.12867669
MLE 80% Quantile	849.2246232
MLE 90% Quantile	2884.481695
MLE 95% Quantile	7844.392612
MLE 99% Quantile	52056.20156
MVU Estimate of Median	39.58590295
MVU Estimate of Mean	905.9205815
MVU Estimate of Std. Dev.	2387.349579
MVU Estimate of SE of Mean	777.8224871

UCL Assuming Lognormal Distribution

95% H-UCL	3744667466
95% Chebyshev (MVUE) UCL	4296.370199
99% Chebyshev (MVUE) UCL	8645.156612

Recommended UCL to use:
Greater of
99 % Chebyshev (MVUE) UCL
99 % Chebyshev (Mean, Std)

From File

Summary Statistics for	Ethylbenzene
Number of Samples	10
Minimum	1.5
Maximum	11000
Mean	2276.84
Median	81.75
Standard Deviation	3896.496562
Variance	15182685.46
Coefficient of Variation	1.711361607
Skewness	1.614183515

95 % UCL (Assuming Normal Data)

Student's-t	4535.56568

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4975.655743
Modified-t	4640.393355

95 % Non-parametric UCL

CLT	4303.596406
Jackknife	4535.56568
Standard Bootstrap	4217.850493
Bootstrap-t	6888.851555
Chebyshev (Mean, Std)	7647.789857

Summary Statistics for	ln(Ethylbenzene)
Minimum	0.405465108
Maximum	9.305650552
Mean	4.609994999
Standard Deviation	3.284787496
Variance	10.7898289
Shapiro-Wilk Test Statisitic	0.90388145
Shapiro-Wilk 5% Critical Value	0.842

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	22134.86944
MLE Standard Deviation	4875891.859
MLE Coefficient of Variation	220.2810309
MLE Skewness	10689518.67
MLE Median	100.4836471
MLE 80% Quantile	1612.660265
MLE 90% Quantile	6842.763377
MLE 95% Quantile	22325.17915
MLE 99% Quantile	209067.1383
MVU Estimate of Median	56.86221222
MVU Estimate of Mean	4056.481716
MVU Estimate of Std. Dev.	20204.09829
MVU Estimate of SE of Mean	3605.459801

UCL Assuming Lognormal Distribution

95% H-UCL	265202951.2
95% Chebyshev (MVUE) UCL	19772.31663
99% Chebyshev (MVUE) UCL	39930.35378

Recommended UCL to use:

Needs further investigation.

From File

Summary Statistics for	Xylenes (total)
Number of Samples	11
Minimum	1.5
Maximum	53000
Mean	12026.62727
Median	95
Standard Deviation	21158.47896
Variance	447681231.9
Coefficient of Variation	1.759302794
Skewness	1.397607713

95 % UCL (Assuming Normal Data)

Student's-t	23589.26159

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	25392.48922
Modified-t	24037.31088

95 % Non-parametric UCL

CLT	22520.00626
Jackknife	23589.26159
Standard Bootstrap	22077.55309
Bootstrap-t	32895.86892
Chebyshev (Mean, Std)	39834.31654

Summary Statistics for	ln(Xylenes (total))
Minimum	0.405465108
Maximum	10.87804719
Mean	4.984129282
Standard Deviation	3.950357463
Variance	15.60532409
Shapiro-Wilk Test Statisitic	0.852552133
Shapiro-Wilk 5% Critical Value	0.85

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	357464.4965
MLE Standard Deviation	874754021.4
MLE Coefficient of Variation	2447.107419
MLE Skewness	1.47E+10
MLE Median	146.0763283
MLE 80% Quantile	4114.124525
MLE 90% Quantile	23396.42758
MLE 95% Quantile	97000.10199
MLE 99% Quantile	1429250.504
MVU Estimate of Median	68.44255177
MVU Estimate of Mean	24204.30669
MVU Estimate of Std. Dev.	181215.6189
MVU Estimate of SE of Mean	22803.78314

UCL Assuming Lognormal Distribution

95% H-UCL	7.46E+10
95% Chebyshev (MVUE) UCL	123603.6929
99% Chebyshev (MVUE) UCL	251099.0841

Recommended UCL to use:

Needs further investigation.

Summary Statistics for	2-Methylnaphthal
Number of Samples	16
Minimum	41
Maximum	24800
Mean	2590.28125
Median	521.25
Standard Deviation	6216.863703
Variance	38649394.3
Coefficient of Variation	2.40007285
Skewness	3.461533916

95 % UCL (Assuming Normal Data)

Student's-t	5314.899683

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	6583.883228
Modified-t	5539.065147

95 % Non-parametric UCL

CLT	5146.738954
Jackknife	5314.899683
Standard Bootstrap	5057.867218
Bootstrap-t	15231.03521
Chebyshev (Mean, Std)	9364.951407

99 % Non-parametric UCL

Chebyshev (Mean, Std)	18054.53446

Summary Statistics for	ln(2-Methylnaphth
Minimum	3.713572067
Maximum	10.11859893
Mean	6.282417226
Standard Deviation	1.747377753
Variance	3.053329011
Shapiro-Wilk Test Statisitic	0.914208053
Shapiro-Wilk 5% Critical Value	0.887

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2462.867824
MLE Standard Deviation	11065.31041
MLE Coefficient of Variation	4.492855971
MLE Skewness	104.1702568
MLE Median	535.0805125
MLE 80% Quantile	2342.447091
MLE 90% Quantile	5053.304369
MLE 95% Quantile	9479.185082
MLE 99% Quantile	31157.73723
MVU Estimate of Median	486.1211376
MVU Estimate of Mean	2023.259492
MVU Estimate of Std. Dev.	5002.173341
MVU Estimate of SE of Mean	1031.371316

UCL Assuming Lognormal Distribution

95% H-UCL	15076.18671
95% Chebyshev (MVUE) UCL	6518.902832
99% Chebyshev (MVUE) UCL	12285.27452

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Benzo(a)Anthrace
Number of Samples	20
Minimum	101
Maximum	5500
Mean	1637.85
Median	777.5
Standard Deviation	1768.027247
Variance	3125920.345
Coefficient of Variation	1.079480567
Skewness	1.158836494

95 % UCL (Assuming Normal Data)

Student's-t	2321.450294

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2397.592757
Modified-t	2338.524081

95 % Non-parametric UCL

CLT	2288.131221
Jackknife	2321.450294
Standard Bootstrap	2280.41186
Bootstrap-t	2489.474395
Chebyshev (Mean, Std)	3361.109797

Summary Statistics for	ln(Benzo(a)Anthra
Minimum	4.615120517
Maximum	8.612503371
Mean	6.789722368
Standard Deviation	1.190533739
Variance	1.417370584
Shapiro-Wilk Test Statisitic	0.945614391
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1805.165688
MLE Standard Deviation	3191.753733
MLE Coefficient of Variation	1.768122314
MLE Skewness	10.83197085
MLE Median	888.6668056
MLE 80% Quantile	2430.186732
MLE 90% Quantile	4103.346844
MLE 95% Quantile	6299.026453
MLE 99% Quantile	14170.30484
MVU Estimate of Median	857.6774248
MVU Estimate of Mean	1707.727346
MVU Estimate of Std. Dev.	2506.65093
MVU Estimate of SE of Mean	523.3372865

UCL Assuming Lognormal Distribution

95% H-UCL	3954.739904
95% Chebyshev (MVUE) UCL	3988.901692
99% Chebyshev (MVUE) UCL	6914.867601

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Benzo(b)Fluorantl
Number of Samples	20
Minimum	130
Maximum	5500
Mean	1642.45
Median	726.5
Standard Deviation	1742.47306
Variance	3036212.366
Coefficient of Variation	1.060898694
Skewness	1.207628012

95 % UCL (Assuming Normal Data)

Student's-t	2316.169875

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2395.753956
Modified-t	2333.705369

95 % Non-parametric UCL

CLT	2283.33238
Jackknife	2316.169875
Standard Bootstrap	2261.472113
Bootstrap-t	2536.927846
Chebyshev (Mean, Std)	3340.802657

Summary Statistics for	ln(Benzo(b)Fluora
Minimum	4.86753445
Maximum	8.612503371
Mean	6.851824549
Standard Deviation	1.104643891
Variance	1.220238125
Shapiro-Wilk Test Statisitic	0.939460093
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1740.527682
MLE Standard Deviation	2689.661257
MLE Coefficient of Variation	1.545313691
MLE Skewness	8.326141521
MLE Median	945.604636
MLE 80% Quantile	2404.864012
MLE 90% Quantile	3909.997247
MLE 95% Quantile	5819.465799
MLE 99% Quantile	12347.71419
MVU Estimate of Median	917.1528323
MVU Estimate of Mean	1663.083123
MVU Estimate of Std. Dev.	2203.56006
MVU Estimate of SE of Mean	467.0339214

UCL Assuming Lognormal Distribution

95% H-UCL	3488.295122
95% Chebyshev (MVUE) UCL	3698.836789
99% Chebyshev (MVUE) UCL	6310.011968

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Benzo(a)Pyrene
Number of Samples	20
Minimum	85
Maximum	5500
Mean	1681.15
Median	880
Standard Deviation	1761.419472
Variance	3102598.555
Coefficient of Variation	1.047746764
Skewness	1.119389519

95 % UCL (Assuming Normal Data)

Student's-t	2362.195425

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2434.341154
Modified-t	2378.62638

95 % Non-parametric UCL

CLT	2329.000879
Jackknife	2362.195425
Standard Bootstrap	2300.531829
Bootstrap-t	2514.568163
Chebyshev (Mean, Std)	3397.969335

Summary Statistics for	ln(Benzo(a)Pyren
Minimum	4.442651256
Maximum	8.612503371
Mean	6.82961824
Standard Deviation	1.201802501
Variance	1.444329252
Shapiro-Wilk Test Statisitic	0.950883734
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1904.134524
MLE Standard Deviation	3426.917348
MLE Coefficient of Variation	1.799724391
MLE Skewness	11.22849467
MLE Median	924.8376793
MLE 80% Quantile	2553.298557
MLE 90% Quantile	4332.649183
MLE 95% Quantile	6678.063672
MLE 99% Quantile	15138.71817
MVU Estimate of Median	891.9835241
MVU Estimate of Mean	1798.803922
MVU Estimate of Std. Dev.	2675.274325
MVU Estimate of SE of Mean	557.3462802

UCL Assuming Lognormal Distribution

95% H-UCL	4222.586421
95% Chebyshev (MVUE) UCL	4228.220034
99% Chebyshev (MVUE) UCL	7344.329391

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Indeno(1,2,3-cd)p
Number of Samples	20
Minimum	72.5
Maximum	5500
Mean	1705.825
Median	680
Standard Deviation	1836.296869
Variance	3371986.191
Coefficient of Variation	1.076486081
Skewness	0.905920351

95 % UCL (Assuming Normal Data)

Student's-t	2415.821456

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2470.09158
Modified-t	2429.684279

95 % Non-parametric UCL

CLT	2381.215819
Jackknife	2415.821456
Standard Bootstrap	2361.097494
Bootstrap-t	2531.616228
Chebyshev (Mean, Std)	3495.625794

Summary Statistics for	ln(Indeno(1,2,3-cc
Minimum	4.283586562
Maximum	8.612503371
Mean	6.669527374
Standard Deviation	1.421296716
Variance	2.020084354
Shapiro-Wilk Test Statisitic	0.92583164
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2163.688214
MLE Standard Deviation	5532.85193
MLE Coefficient of Variation	2.557139192
MLE Skewness	24.39245063
MLE Median	788.0230764
MLE 80% Quantile	2618.935192
MLE 90% Quantile	4894.628477
MLE 95% Quantile	8164.579234
MLE 99% Quantile	21492.59067
MVU Estimate of Median	749.1229319
MVU Estimate of Mean	1977.299587
MVU Estimate of Std. Dev.	3758.374126
MVU Estimate of SE of Mean	744.9952293

UCL Assuming Lognormal Distribution

95% H-UCL	6208.286259
95% Chebyshev (MVUE) UCL	5224.658505
99% Chebyshev (MVUE) UCL	9389.908526

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Dibenz(a,h) anthr
Number of Samples	20
Minimum	1.25
Maximum	5500
Mean	1298.3625
Median	521.25
Standard Deviation	1801.034577
Variance	3243725.549
Coefficient of Variation	1.3871585
Skewness	1.562759953

95 % UCL (Assuming Normal Data)

Student's-t	1994.724939

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2111.155059
Modified-t	2018.179812

95 % Non-parametric UCL

CLT	1960.783833
Jackknife	1994.724939
Standard Bootstrap	1933.903099
Bootstrap-t	2336.447081
Chebyshev (Mean, Std)	3053.793863

Summary Statistics for	ln(Dibenz(a,h) ant
Minimum	0.223143551
Maximum	8.612503371
Mean	6.005192176
Standard Deviation	1.985687578
Variance	3.942955156
Shapiro-Wilk Test Statisitic	0.907789279
Shapiro-Wilk 5% Critical Value	0.905

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2912.216498
MLE Standard Deviation	20709.68374
MLE Coefficient of Variation	7.111313241
MLE Skewness	380.9585688
MLE Median	405.528914
MLE 80% Quantile	2171.33655
MLE 90% Quantile	5202.011791
MLE 95% Quantile	10632.26198
MLE 99% Quantile	41105.6755
MVU Estimate of Median	367.2894474
MVU Estimate of Mean	2297.232878
MVU Estimate of Std. Dev.	7718.100494
MVU Estimate of SE of Mean	1258.110432

UCL Assuming Lognormal Distribution

95% H-UCL	19609.45319
95% Chebyshev (MVUE) UCL	7781.209111
99% Chebyshev (MVUE) UCL	14815.27362

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	C11-C22 Aromati
Number of Samples	43
Minimum	22000
Maximum	97000000
Mean	7239279.07
Median	330000
Standard Deviation	19923186.12
Variance	3.97E+14
Coefficient of Variation	2.75209533
Skewness	3.682280794
Shapiro-Wilk Test Statisitic	0.419518602
Shapiro-Wilk 5% Critical Value	0.943
Data not Normal at 5% Significance Level	
Data not Lognormal: Try Non-parametric UCL	
95 % UCL (Assuming Normal Data)	
Student's-t	12349482.48
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	14059771.91
Modified-t	12633834.28
95 % Non-parametric UCL	
CLT	12236767.78
Jackknife	12349482.48
Standard Bootstrap	12225770.35
Bootstrap-t	21540845.69
Chebyshev (Mean, Std)	20482736.04

From File

Summary Statistics for	C19-C36 Aliphatic
Number of Samples	8
Minimum	24000
Maximum	19400000
Mean	2618375
Median	98000
Standard Deviation	6789189.957
Variance	4.61E+13
Coefficient of Variation	2.59290207
Skewness	2.814780099

95 % UCL (Assuming Normal Data)

Student's-t	7166009.685

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	9119009.046
Modified-t	7564136.285

95 % Non-parametric UCL

CLT	6566584.814
Jackknife	7166009.685
Standard Bootstrap	6345946.128
Bootstrap-t	283380269
Chebyshev (Mean, Std)	13081219.41

99 % Non-parametric UCL

Chebyshev (Mean, Std)	26501467.68

Summary Statistics for	ln(C19-C36 Alipha
Minimum	10.08580911
Maximum	16.78078362
Mean	12.14249929
Standard Deviation	2.215607736
Variance	4.90891764
Shapiro-Wilk Test Statisitic	0.844319252
Shapiro-Wilk 5% Critical Value	0.818

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2184632.344
MLE Standard Deviation	25335395.5
MLE Coefficient of Variation	11.59709805
MLE Skewness	1594.516128
MLE Median	187681.0557
MLE 80% Quantile	1220398.284
MLE 90% Quantile	3235050.931
MLE 95% Quantile	7182614.524
MLE 99% Quantile	32475706.74
MVU Estimate of Median	136540.2817
MVU Estimate of Mean	1135462.123
MVU Estimate of Std. Dev.	2848886.639
MVU Estimate of SE of Mean	830335.3301

UCL Assuming Lognormal Distribution

95% H-UCL	722288965.9
95% Chebyshev (MVUE) UCL	4754809.916
99% Chebyshev (MVUE) UCL	9397194.343

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	C9-C18 Aliphatic
Number of Samples	8
Minimum	2700
Maximum	2500000
Mean	329655.625
Median	3810
Standard Deviation	877691.7545
Variance	7.70E+11
Coefficient of Variation	2.662450412
Skewness	2.81907995

Shapiro-Wilk Test Statisitic	0.443304752
Shapiro-Wilk 5% Critical Value	0.818

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	917563.9751

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1170547.561
Modified-t	969111.5423

95 % Non-parametric UCL

CLT	840071.6276
Jackknife	917563.9751
Standard Bootstrap	803491.498
Bootstrap-t	82842606.56
Chebyshev (Mean, Std)	1682269.46

From File

Summary Statistics for	Chromium (VI)
Number of Samples	68
Minimum	500
Maximum	365750
Mean	27174.02941
Median	4455
Standard Deviation	65132.28362
Variance	4.24E+09
Coefficient of Variation	2.396857773
Skewness	4.110260086

Lilliefors Test Statisitic	0.341073135
Lilliefors 5% Critical Value	0.107443282

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	40347.97789

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	44372.47991
Modified-t	41004.13139

95 % Non-parametric UCL

CLT	40165.82282
Jackknife	40347.97789
Standard Bootstrap	40097.6168
Bootstrap-t	53882.32037
Chebyshev (Mean, Std)	61602.57285

From File

Summary Statistics for	Antimony
Number of Samples	10
Minimum	175
Maximum	117000
Mean	25152
Median	2537.5
Standard Deviation	46201.26467
Variance	2134556857
Coefficient of Variation	1.836882342
Skewness	1.7666626

95 % UCL (Assuming Normal Data)

Student's-t	51934.00308

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	57904.94723
Modified-t	53294.37052

95 % Non-parametric UCL

CLT	49183.51335
Jackknife	51934.00308
Standard Bootstrap	47870.60258
Bootstrap-t	332667.0072
Chebyshev (Mean, Std)	88836.04846

99 % Non-parametric UCL

Chebyshev (Mean, Std)	170520.8855

Summary Statistics for	ln(Antimony)
Minimum	5.164785974
Maximum	11.66992921
Mean	8.382498944
Standard Deviation	2.024329551
Variance	4.097910132
Shapiro-Wilk Test Statisitic	0.917368567
Shapiro-Wilk 5% Critical Value	0.842

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	33909.61935
MLE Standard Deviation	260937.3654
MLE Coefficient of Variation	7.695083887
MLE Skewness	478.7443808
MLE Median	4369.915466
MLE 80% Quantile	24174.59131
MLE 90% Quantile	58909.781
MLE 95% Quantile	122090.8911
MLE 99% Quantile	484605.0362
MVU Estimate of Median	3546.148687
MVU Estimate of Mean	21972.61089
MVU Estimate of Std. Dev.	55409.92585
MVU Estimate of SE of Mean	14424.53511

UCL Assuming Lognormal Distribution

95% H-UCL	1345519.595
95% Chebyshev (MVUE) UCL	84847.70172
99% Chebyshev (MVUE) UCL	165494.9231

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Arsenic
Number of Samples	13
Minimum	3800
Maximum	17000
Mean	9101.923077
Median	7500
Standard Deviation	4217.059372
Variance	17783589.74
Coefficient of Variation	0.463315207
Skewness	0.914265116
Shapiro-Wilk Test Statisitic	0.89233594
Shapiro-Wilk 5% Critical Value	0.866
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t
95 % UCL (Assuming Normal Data)	
Student's-t	11186.48977
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	11342.64447
Modified-t	11235.91939
95 % Non-parametric UCL	
CLT	11025.74689
Jackknife	11186.48977
Standard Bootstrap	11027.24543
Bootstrap-t	11977.22543
Chebyshev (Mean, Std)	14200.09926

From File

Summary Statistics for	Barium
Number of Samples	10
Minimum	46000
Maximum	2600000
Mean	488680
Median	276000
Standard Deviation	755731.3688
Variance	5.71E+11
Coefficient of Variation	1.54647493
Skewness	2.950515887

95 % UCL (Assuming Normal Data)

Student's-t	926763.2428

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1120029.537
Modified-t	963926.533

95 % Non-parametric UCL

CLT	881772.4534
Jackknife	926763.2428
Standard Bootstrap	865126.0615
Bootstrap-t	2158427.735
Chebyshev (Mean, Std)	1530383.803

Summary Statistics for	ln(Barium)
Minimum	10.73639668
Maximum	14.771022
Mean	12.48035756
Standard Deviation	1.087953866
Variance	1.183643615
Shapiro-Wilk Test Statisitic	0.956305899
Shapiro-Wilk 5% Critical Value	0.842

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	475527.2028
MLE Standard Deviation	715862.4985
MLE Coefficient of Variation	1.505408091
MLE Skewness	7.927860657
MLE Median	263117.916
MLE 80% Quantile	659791.119
MLE 90% Quantile	1064885.968
MLE 95% Quantile	1575434.509
MLE 99% Quantile	3304970.99
MVU Estimate of Median	247917.9298
MVU Estimate of Mean	437873.8572
MVU Estimate of Std. Dev.	517235.4164
MVU Estimate of SE of Mean	158521.9436

UCL Assuming Lognormal Distribution

95% H-UCL	1565778.513
95% Chebyshev (MVUE) UCL	1128854.99
99% Chebyshev (MVUE) UCL	2015147.281

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Cadmium
Number of Samples	13
Minimum	325
Maximum	4800
Mean	2164.230769
Median	2355
Standard Deviation	1667.74904
Variance	2781386.859
Coefficient of Variation	0.770596677
Skewness	0.260772553

Shapiro-Wilk Test Statisitic	0.875748997
Shapiro-Wilk 5% Critical Value	0.866
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t

95 % UCL (Assuming Normal Data)

Student's-t	2988.628481

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	2960.804587
Modified-t	2994.204162

95 % Non-parametric UCL

CLT	2925.058407
Jackknife	2988.628481
Standard Bootstrap	2877.4323
Bootstrap-t	2990.669641
Chebyshev (Mean, Std)	4180.441044

From File

Summary Statistics for	Chromium
Number of Samples	67
Minimum	45100
Maximum	66500000
Mean	5319807.463
Median	916000
Standard Deviation	11963098.43
Variance	1.43E+14
Coefficient of Variation	2.248784098
Skewness	3.963554258

95 % UCL (Assuming Normal Data)	
Student's-t	7758026.269
95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	8479997.817
Modified-t	7875977.487
95 % Non-parametric UCL	
CLT	7723802.306
Jackknife	7758026.269
Standard Bootstrap	7722959.692
Bootstrap-t	9611678.234
Chebyshev (Mean, Std)	11690447.62

Summary Statistics for	ln(Chromium)
Minimum	10.71663753
Maximum	18.01271251
Mean	13.89772071
Standard Deviation	1.853134781
Variance	3.434108515
Lilliefors Test Statisitic	0.064523236
Lilliefors 5% Critical Value	0.108242128

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	6045199.034
MLE Standard Deviation	33112994.12
MLE Coefficient of Variation	5.477568883
MLE Skewness	180.7803735
MLE Median	1085683.944
MLE 80% Quantile	5197142.944
MLE 90% Quantile	11745713.25
MLE 95% Quantile	22888094.06
MLE 99% Quantile	80850490.36
MVU Estimate of Median	1058203.657
MVU Estimate of Mean	5663587.188
MVU Estimate of Std. Dev.	23776874.97
MVU Estimate of SE of Mean	1886623.262

UCL Assuming Lognormal Distribution	
95% H-UCL	12649285.48
95% Chebyshev (MVUE) UCL	13887187.33
99% Chebyshev (MVUE) UCL	24435251.63

Recommended UCL to use:
H-UCL

From File

Summary Statistics for	Lead
Number of Samples	62
Minimum	30000
Maximum	35100000
Mean	2449709.677
Median	625000
Standard Deviation	5900167.74
Variance	3.48E+13
Coefficient of Variation	2.408517137
Skewness	4.141344491

95 % UCL (Assuming Normal Data)

Student's-t	3701241.703

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	4103343.694
Modified-t	3766926.185

95 % Non-parametric UCL

CLT	3682234.774
Jackknife	3701241.703
Standard Bootstrap	3638109.02
Bootstrap-t	4790255.803
Chebyshev (Mean, Std)	5715928.779

Summary Statistics for	ln(Lead)
Minimum	10.30895266
Maximum	17.37371169
Mean	13.36269023
Standard Deviation	1.584802545
Variance	2.511599107
Lilliefors Test Statisitic	0.086216789
Lilliefors 5% Critical Value	0.112522113

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	2232181.206
MLE Standard Deviation	7511753.329
MLE Coefficient of Variation	3.365207677
MLE Skewness	48.20533029
MLE Median	635832.3652
MLE 80% Quantile	2426228.087
MLE 90% Quantile	4872713.377
MLE 95% Quantile	8620817.001
MLE 99% Quantile	25366525.04
MVU Estimate of Median	623079.1785
MVU Estimate of Mean	2137511.483
MVU Estimate of Std. Dev.	6055579.252
MVU Estimate of SE of Mean	592236.3646

UCL Assuming Lognormal Distribution

95% H-UCL	4040782.667
95% Chebyshev (MVUE) UCL	4719009.946
99% Chebyshev (MVUE) UCL	8030188.908

Recommended UCL to use:
H-UCL

From File

Summary Statistics for	Manganese
Number of Samples	10
Minimum	79000
Maximum	575000
Mean	250040
Median	228500
Standard Deviation	150997.3304
Variance	2.28E+10
Coefficient of Variation	0.603892699
Skewness	1.039973225

Shapiro-Wilk Test Statisitic	0.92369351
Shapiro-Wilk 5% Critical Value	0.842
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t

95 % UCL (Assuming Normal Data)	
Student's-t	337570.3089

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	345360.2408
Modified-t	340187.5286

95 % Non-parametric UCL	
CLT	328581.018
Jackknife	337570.3089
Standard Bootstrap	326367.8435
Bootstrap-t	363798.831
Chebyshev (Mean, Std)	458175.4563

From File

Summary Statistics for	Mercury
Number of Samples	10
Minimum	85.5
Maximum	7400
Mean	1226.95
Median	475
Standard Deviation	2209.835168
Variance	4883371.469
Coefficient of Variation	1.80108005
Skewness	2.95161907

95 % UCL (Assuming Normal Data)

Student's-t	2507.949832

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	3073.340564
Modified-t	2616.659692

95 % Non-parametric UCL

CLT	2376.392201
Jackknife	2507.949832
Standard Bootstrap	2312.827114
Bootstrap-t	6163.67381
Chebyshev (Mean, Std)	4272.997569

Summary Statistics for	ln(Mercury)
Minimum	4.448516376
Maximum	8.909235279
Mean	6.214991615
Standard Deviation	1.317214289
Variance	1.735053484
Shapiro-Wilk Test Statisitic	0.938066095
Shapiro-Wilk 5% Critical Value	0.842

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	1190.964017
MLE Standard Deviation	2573.483102
MLE Coefficient of Variation	2.160840348
MLE Skewness	16.5719838
MLE Median	500.1917949
MLE 80% Quantile	1522.391434
MLE 90% Quantile	2717.89232
MLE 95% Quantile	4366.902037
MLE 99% Quantile	10708.91715
MVU Estimate of Median	458.308391
MVU Estimate of Mean	1040.808477
MVU Estimate of Std. Dev.	1535.703308
MVU Estimate of SE of Mean	458.4063723

UCL Assuming Lognormal Distribution

95% H-UCL	6285.302903
95% Chebyshev (MVUE) UCL	3038.955529
99% Chebyshev (MVUE) UCL	5601.894292

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Vanadium
Number of Samples	10
Minimum	11000
Maximum	96300
Mean	40570
Median	37750
Standard Deviation	25676.49379
Variance	659282333.3
Coefficient of Variation	0.632893611
Skewness	1.133234128

Shapiro-Wilk Test Statisitic	0.891935198
Shapiro-Wilk 5% Critical Value	0.842
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t

95 % UCL (Assuming Normal Data)

Student's-t	55454.17992

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	57034.69465
Modified-t	55939.1379

95 % Non-parametric UCL

CLT	53925.58686
Jackknife	55454.17992
Standard Bootstrap	52874.26707
Bootstrap-t	61635.27147
Chebyshev (Mean, Std)	75962.60422

From File

Summary Statistics for	TEQ (no 170/193/
Number of Samples	7
Minimum	0.01334373
Maximum	0.2841489
Mean	0.111786031
Median	0.118581
Standard Deviation	0.098431637
Variance	0.009688787
Coefficient of Variation	0.880536108
Skewness	0.753133704

Shapiro-Wilk Test Statisitic	0.904408418
Shapiro-Wilk 5% Critical Value	0.803
Data are Normal at 5% Significance Level	
Recommended UCL to use	Student's-t

95 % UCL (Assuming Normal Data)

Student's-t	0.184079428

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	0.184296511
Modified-t	0.18584448

95 % Non-parametric UCL

CLT	0.17298061
Jackknife	0.184079428
Standard Bootstrap	0.168652337
Bootstrap-t	0.200582585
Chebyshev (Mean, Std)	0.273953034

From File

Summary Statistics for	gamma-Chlordan
Number of Samples	7
Minimum	6.55
Maximum	1977
Mean	340.0935714
Median	50.2
Standard Deviation	726.6691882
Variance	528048.109
Coefficient of Variation	2.136674284
Skewness	2.575482481

95 % UCL (Assuming Normal Data)

Student's-t	873.797827

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	1077.539677
Modified-t	918.3579166

95 % Non-parametric UCL

CLT	791.8610696
Jackknife	873.797827
Standard Bootstrap	763.7383216
Bootstrap-t	12105.48767
Chebyshev (Mean, Std)	1537.287557

99 % Non-parametric UCL

Chebyshev (Mean, Std)	3072.877678

Summary Statistics for	ln(gamma-Chlord
Minimum	1.87946505
Maximum	7.589335823
Mean	4.121901453
Standard Deviation	1.915136764
Variance	3.667748826
Shapiro-Wilk Test Statisitic	0.933068436
Shapiro-Wilk 5% Critical Value	0.803

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	385.9762606
MLE Standard Deviation	2384.435083
MLE Coefficient of Variation	6.177672894
MLE Skewness	254.2955178
MLE Median	61.67640565
MLE 80% Quantile	311.1241471
MLE 90% Quantile	722.597382
MLE 95% Quantile	1439.860382
MLE 99% Quantile	5305.554488
MVU Estimate of Median	47.02520789
MVU Estimate of Mean	237.7944062
MVU Estimate of Std. Dev.	475.761597
MVU Estimate of SE of Mean	160.4005615

UCL Assuming Lognormal Distribution

95% H-UCL	61150.37594
95% Chebyshev (MVUE) UCL	936.9642443
99% Chebyshev (MVUE) UCL	1833.759842

Recommended UCL to use:

99 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	PCBs
Number of Samples	6
Minimum	50
Maximum	42000
Mean	9975
Median	375
Standard Deviation	17067.12483
Variance	291286750
Coefficient of Variation	1.710989958
Skewness	1.777902899

95 % UCL (Assuming Normal Data)	
Student's-t	24015.09951

95 % UCL (Adjusted for Skewness)	
Adjusted-CLT	26839.50134
Modified-t	24857.97981

95 % Non-parametric UCL	
CLT	21435.7225
Jackknife	24015.09951
Standard Bootstrap	20379.69347
Bootstrap-t	566423.3428
Chebyshev (Mean, Std)	40346.17123

99 % Non-parametric UCL	
Chebyshev (Mean, Std)	79301.98879

Summary Statistics for	ln(PCBs)
Minimum	3.912023005
Maximum	10.6454249
Mean	6.54876368
Standard Deviation	2.988655817
Variance	8.932063592
Shapiro-Wilk Test Statisitic	0.841293438
Shapiro-Wilk 5% Critical Value	0.788

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution	
MLE Mean	60766.59399
MLE Standard Deviation	5286998.361
MLE Coefficient of Variation	87.00501399
MLE Skewness	658877.8743
MLE Median	698.3802184
MLE 80% Quantile	8727.007838
MLE 90% Quantile	32506.20928
MLE 95% Quantile	95330.2539
MLE 99% Quantile	729691.4921
MVU Estimate of Median	299.2128382
MVU Estimate of Mean	10498.73595
MVU Estimate of Std. Dev.	29561.38721
MVU Estimate of SE of Mean	9284.951885

UCL Assuming Lognormal Distribution	
95% H-UCL	5.00E+11
95% Chebyshev (MVUE) UCL	50970.90291
99% Chebyshev (MVUE) UCL	102882.8407

Recommended UCL to use:
Greater of
99 % Chebyshev (MVUE) UCL
99 % Chebyshev (Mean, Std)

From File

Summary Statistics for	Aroclor 1254
Number of Samples	57
Minimum	5
Maximum	220000
Mean	13175.87719
Median	2900
Standard Deviation	32863.90983
Variance	1080036569
Coefficient of Variation	2.494248341
Skewness	4.906753847

95 % UCL (Assuming Normal Data)

Student's-t	20456.25052

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	23358.67901
Modified-t	20927.75671

95 % Non-parametric UCL

CLT	20335.81186
Jackknife	20456.25052
Standard Bootstrap	20296.81268
Bootstrap-t	28240.82511
Chebyshev (Mean, Std)	32149.86438

Summary Statistics for	ln(Aroclor 1254)
Minimum	1.609437912
Maximum	12.30138283
Mean	7.425261618
Standard Deviation	2.439581829
Variance	5.951559501
Lilliefors Test Statisitic	0.103623626
Lilliefors 5% Critical Value	0.117353567

Data are Lognormal at 5% Significance Level

Estimates Assuming Lognormal Distribution

MLE Mean	32893.86248
MLE Standard Deviation	644041.5579
MLE Coefficient of Variation	19.57938379
MLE Skewness	7564.539362
MLE Median	1677.838469
MLE 80% Quantile	13183.32779
MLE 90% Quantile	38565.92019
MLE 95% Quantile	92815.94519
MLE 99% Quantile	488809.9061
MVU Estimate of Median	1592.416344
MVU Estimate of Mean	27385.9705
MVU Estimate of Std. Dev.	257470.4969
MVU Estimate of SE of Mean	13984.40195

UCL Assuming Lognormal Distribution

95% H-UCL	124585.7968
95% Chebyshev (MVUE) UCL	88342.56537
99% Chebyshev (MVUE) UCL	166529.013

Recommended UCL to use:

95 % Chebyshev (MVUE) UCL

From File

Summary Statistics for	Aroclor 1260
Number of Samples	56
Minimum	50
Maximum	450000
Mean	11277.28571
Median	800
Standard Deviation	60033.37057
Variance	3604005582
Coefficient of Variation	5.323388277
Skewness	7.356512111

Lilliefors Test Statisitic	0.434982064
Lilliefors 5% Critical Value	0.11839673

Data not Normal at 5% Significance Level
Data not Lognormal: Try Non-parametric UCL

95 % UCL (Assuming Normal Data)

Student's-t	24698.85757

95 % UCL (Adjusted for Skewness)

Adjusted-CLT	32899.48036
Modified-t	26013.25107

95 % Non-parametric UCL

CLT	24472.78936
Jackknife	24698.85757
Standard Bootstrap	24169.3583
Bootstrap-t	137561.0167
Chebyshev (Mean, Std)	46245.66583