PROFESSIONAL VERSION
OF
MECHANICAL
RELIABILITY
IMPROVEMENT:

PROBABILITY AND STATISTICS FOR
EXPERIMENTAL TESTING

R.E. Little
Assisted by D. M. Kosikowski
With Thanks to H. Khor
PREFACE

This is a professional version of my reference/text book (whose preface appears below) that emphasized asymptotic maximum likelihood (ML) analyses and only briefly introduced the notion of pragmatic analyses. This professional version deals with potential and actual Type I censoring for the first time in the statistical literature and examines alternative ML analyses that include pragmatic statistical bias corrections. The accompanying microcomputer programs have no peer.

R. E. Little
Dearborn, Michigan
June, 2003


Mechanical reliability analysis is no longer limited to a small collection of classical statistical analyses. The speed of the present generation of microcomputers makes it possible to program and evaluate alternative computer-intensive analyses for each mechanical reliability application of specific interest. Thus computer-intensive analyses are now an indispensable part of improving mechanical reliability.

This is a self-contained mechanical reliability reference/text book. It covers the probability and statistics background required to plan, conduct, and analyze mechanical reliability experiment test programs. Unfortunately this background is not adequately conveyed by a traditional probability and statistics course for engineers because it (i) does not provide adequate information regarding test planning and the associated details of test conduct, (ii) does not employ vector and matrix concepts in stating conceptual statistical models, (iii) does not exploit direct analogies between engineering mechanics concepts and probability and statistics concepts, (iv) does not exploit the use of microcomputers to perform computer-intensive simulation-based, randomization-based, and enumeration-based statistical analyses, and (v) is woefully inept relative to practical mechanical reliability models. This book attempts to overcome each of these fundamental deficiencies.

Type-setting costs have traditionally forced authors to use overly succinct nomenclature and notation when presenting probability and statistics concepts. But thirty years of teaching experience clearly indicates that overly succinct notation extracts an extremely heavy price in terms of perspective and understanding. Accordingly, acronyms are employed throughout this book to convey explicitly the technical presumptions that the traditional notations are intended to convey implicitly. Although it may take some time to become comfortable with these acronyms, their use highlights the technical presumptions that underlie each reliability analysis, thereby providing valuable perspective regarding its applicability and practicality.

Test planning details and orthogonal conceptual statistical models are presented in Chapters One and Two for completely randomized design test programs with equal replication, and for unreplicated randomized complete block design and split-plot design experiment test programs. The respective conceptual statistical models are stated in column vector notation to demonstrate relevant orthogonality relationships. This presentation provides intuition regarding the construction of the associated orthogonal augmented contrast arrays. Use of orthogonal augmented contrast arrays in statistical
analysis markedly enhances understanding the mechanics of partitioning statistically relevant sums of squares and the enumeration of the associated statistical degrees of freedom.

Enumeration-based and simulation-based microcomputer programs are presented in Chapters Three through Six that establish and illustrate the probability and statistics concepts of fundamental interest in mechanical reliability. Several elementary statistical tests of hypotheses are presented and illustrated. The relationship of these tests of hypotheses to their associated statistical confidence intervals is explained. Computer-intensive statistical tests of hypotheses that serve as viable alternatives to classical statistical tests of hypotheses are also presented. In turn, linear regression analysis is presented in Chapter Seven using both column vector and matrix notation. Emphasis is placed on testing the adequacy of the presumed conceptual regression model and on allocation of test specimens to the particular independent variable values that have statistical advantage.

Chapters One through Seven establish the test planning and probability and statistics background to understand the mechanical reliability analyses that are presented, discussed, and then illustrated using example microcomputer programs in Chapter Eight. Mechanical reliability cannot rationally be separated from mechanical metallurgy. The appropriate reliability improvement experiment test program depends on the relevant mode(s) of failure, the available test equipment and the test method, as well as on various practical and economic considerations. Thus, to excel, a reliability engineer must have the ability to program and evaluate mechanical reliability analyses that are consistent with the actual details of the experiment test program conduct. In particular, it is important that (i) statistically effective test specimen allocation strategies be employed in conducting each individual test, (ii) the statistical adequacy of the presumed failure model be critically examined, and (iii) the accuracy and precision of the resulting statistical estimates be evaluated and properly interpreted.

R. E. Little
Dearborn, Michigan
July, 2001
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NOTE: Each of these microcomputer programs writes its output into a microcomputer file with the same name.

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<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses without statistical bias corrections on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution with a known coefficient of variation</td>
<td>(LCYNCDTA)</td>
<td>(8.322)</td>
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<td>ABLNSTLN</td>
<td>Computes an exact (unbiased) $A$-basis statistical tolerance limit based on 6 to 32 replicate datum values with no censoring that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution</td>
<td>(LNTLNDTA)</td>
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<td>ABNMLNA</td>
<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses with only the Version LS statistical bias-correction factor for ML est($csp$) on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual (two-parameter) normal distribution with a known coefficient of variation</td>
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<td>ABNMLNB</td>
<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses with the exact multiplicative mean statistical bias-correction factor for generic est($csp$) on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual (two-parameter) normal distribution with a known coefficient of variation</td>
<td>(NCYNCDTA)</td>
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<tr>
<td>ABNMLNC</td>
<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses with the exact multiplicative median statistical bias-correction factor for generic est($csp$) on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual (two-parameter) normal distribution with a known coefficient of variation</td>
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<tr>
<td>ABNMLNN</td>
<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses with no statistical bias corrections on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual (two-parameter) normal distribution with a known coefficient of variation</td>
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<tr>
<td>ABNSTLN</td>
<td>Computes an exact (unbiased) $A$-basis statistical tolerance limit based on 6 to 32 replicate datum values with no censoring that are presumed to have been randomly selected from a conceptual (two-parameter) normal life (endurance) distribution</td>
<td>(NTLDATAN)</td>
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<tr>
<td>ABWMLNN</td>
<td>Computes a simulation-based slightly biased $A$-basis statistical tolerance limit by conducting ML analyses without statistical bias corrections on 30000 sets of 6 to 32 replicate pseudorandom datum values with no censoring that are alleged to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution with a known coefficient of variation</td>
<td>(WCVYNCDTA)</td>
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ABWSTLIN
Compute the Thoman, Bain, and Antle simulation-based exact (unbiased) $A$-basis statistical tolerance limits based on 6 to 16 replicate datum values with no censoring that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution

(8.57)

ABWSTL2N
Computes the Mann and Fertig simulation-based exact (unbiased) $A$-basis statistical tolerance limits based on 6 to 16 replicate datum values with no censoring that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution

(8.57)

AGESTCV
Aggregates the elements of adjacent column vectors in the estimated complete analytical model

See Text Example

ANOVA
Performs a (fixed-effects) ANOVA using Snedecor's central $F$ test statistic

See Text Example

ANOVADTA
Generates the pseudorandom CRHNDEE's used in constructing of the pseudorandom CRHNDDD's for the Chapter Six ANOVA numerical examples

Prompt

ANOVANT
Tests the null hypothesis of normality for the est(CRHNDDEE's) of specific interest in ANOVA using a generalized version of Michael's modified MDSPP test statistic

AANOVDTA

6.27

ATCMLRM
Performs a statistical test of the adequacy of the conceptual multiple linear regression model

See Text Example

ATCSLRM
Performs a statistical test of the adequacy of the conceptual simple linear regression model (and also tests the null hypothesis that the actual value for the cpl is equal to zero)

EXSLRDTA

7.22

ATZISLRM
Performs a statistical test of the adequacy of the zero-intercept simple linear regression model (and also tests the null hypothesis that the actual value for the cpl is equal to zero)

EXZIRDTA

7.36

AVE1
Simulates the statistical behavior of the arithmetic average of $n_d$ independent uniformly distributed pseudorandom numbers - version 1

Prompt

3.18

AVE2
Simulates the statistical behavior of the arithmetic average of $n_d$ independent uniformly distributed pseudorandom numbers - version 2

Prompt

3.20

AVE3A
Examines the simulation errors pertaining to the sum of $n_d$ normal pseudorandom numbers generated using the Knuth polar method in conjunction with the Wichmann-Hill pseudorandom number generator. (Microcomputer program AVE3A2 is an extension of microcomputer program AVE3A with 1000000 simulations)

Prompt

4.8

AVE3B
Examines the normal approximation errors pertaining to the sum of $n_d$ uniform pseudorandom numbers generated using the Wichmann-Hill pseudorandom number generator. (Microcomputer program AVE3B2 is an extension of microcomputer program AVE3B with 1000000 simulations)

Prompt

4.10

AVE3C
Examines the normal approximation errors pertaining to the sum of $n_d$ exponential pseudorandom numbers generated using the Wichmann-Hill pseudorandom number generator. (Microcomputer program AVE3C2 is an extension of microcomputer program AVE3C with 1000000 simulations)

Prompt

4.11

AVE3D
Examines the simulation errors pertaining to the sum of $n_d$ normal pseudorandom numbers generated using the IBM SSP normal distribution algorithm in conjunction with the Wichmann-Hill pseudorandom number generator. (Microcomputer program AVE3D2 is an extension of microcomputer program AVE3D with 1000000 simulations)

Prompt

(4.9)
PERFORMS BARTLETT'S LIKELIHOOD RATIO TEST FOR HOMOSEDASTICITY THAT TECHNICALLY PERTAINS ONLY TO THE RESPECTIVE EST(CRHNDDEE'S) GENERATED IN FIXED EFFECTS ANOVA FOR AN EQUALLY-REPLICATED CRD EXPERIMENT TEST PROGRAM, BUT IS EXTENDED HEREIN TO THE NON-REPEATED EST(CRHNDDEE'S) GENERATED IN FIXED EFFECTS ANOVA'S PERTAINING TO EITHER UNREPLICATED RCBD OR SPD EXPERIMENT TEST PROGRAMS

COMPUTES A SIMULATION-BASED SLIGHTLY BIASED B-BASIS STATISTICAL TOLERANCE LIMIT BY CONDUCTING ML ANALYSES WITHOUT STATISTICAL BIAS CORRECTIONS ON 30000 SETS OF 6 TO 32 REPLICATE PSEUDORANDOM DATUM VALUES WITH NO CENSORING THAT ARE ALLEGED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER LOG-E-NORMAL DISTRIBUTION WITH A KNOWN COEFFICIENT OF VARIATION

COMPUTES AN EXACT (UNBIASED) B-BASIS STATISTICAL TOLERANCE LIMIT BASED ON 6 TO 32 REPLICATE DATUM VALUES WITH NO CENSORING THAT ARE PRESUMED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER LOG-E-NORMAL LIFE (ENDURANCE) DISTRIBUTION

COMPUTES A SIMULATION-BASED SLIGHTLY BIASED A-BASIS STATISTICAL TOLERANCE LIMIT BY CONDUCTING ML ANALYSES WITH NO STATISTICAL BIAS CORRECTIONS ON 30000 SETS OF 6 TO 32 REPLICATE PSEUDORANDOM DATUM VALUES WITH NO CENSORING THAT ARE ALLEGED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL (TWO-PARAMETER) NORMAL DISTRIBUTION WITH A KNOWN COEFFICIENT OF VARIATION

COMPUTES AN EXACT (UNBIASED) B-BASIS STATISTICAL TOLERANCE LIMIT BASED ON 6 TO 32 REPLICATE DATUM VALUES WITH NO CENSORING THAT ARE PRESUMED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL (TWO-PARAMETER) NORMAL LIFE (ENDURANCE) DISTRIBUTION

COMPUTES A SIMULATION-BASED SLIGHTLY BIASED B-BASIS STATISTICAL TOLERANCE LIMIT BY CONDUCTING ML ANALYSES WITHOUT STATISTICAL BIAS CORRECTIONS ON 30000 SETS OF 6 TO 32 REPLICATE PSEUDORANDOM DATUM VALUES WITH NO CENSORING THAT ARE ALLEGED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER WEIBULL LIFE (ENDURANCE) DISTRIBUTION WITH A KNOWN COEFFICIENT OF VARIATION

COMPUTES THE THOMAN, BAIN, AND ANTLE SIMULATION-BASED EXACT (UNBIASED) B-BASIS STATISTICAL TOLERANCE LIMITS BASED ON 6 TO 16 REPLICATE DATUM VALUES WITH NO CENSORING THAT ARE PRESUMED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER WEIBULL LIFE (ENDURANCE) DISTRIBUTION

COMPUTES THE MANN AND FERTIG SIMULATION-BASED EXACT (UNBIASED) B-BASIS STATISTICAL TOLERANCE LIMITS BASED ON 6 TO 16 REPLICATE DATUM VALUES WITH NO CENSORING THAT ARE PRESUMED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER WEIBULL LIFE (ENDURANCE) DISTRIBUTION

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COMPUTES THE BIAS-CORRECTED VALUE FOR THE COEFFICIENT OF VARIATION GIVEN LIFE (ENDURANCE) DATUM VALUES WITH ACTUAL TYPE I CENSORING THAT ARE PRESUMED TO HAVE BEEN RANDOMLY SELECTED FROM A CONCEPTUAL TWO-PARAMETER LOG-E-NORMAL DISTRIBUTION, BASED ON A ML ANALYSIS WITH EXTRAPOLATED VERSION LS STATISTICAL BIAS-CORRECTION FACTORS AND AN EXTRAPOLATED EXACT MEDIAN STATISTICAL BIAS-CORRECTION FACTOR FOR GENERIC EST(CSP) BASED ON N TOTAL

BCLNCVA1

BCLNCVA2
Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with no censoring that are presumed to have been randomly selected from a conceptual two-parameter loge-normal distribution, based on a ML analysis with Version LS statistical bias-correction factors and the exact median statistical bias-correction factor for generic est(csp)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with potential Type I censoring that are presumed to have been randomly selected from a conceptual two-parameter loge-normal distribution, based on a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact median statistical bias-correction factor for generic est(csp)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with actual Type I censoring that are presumed to have been randomly selected from a conceptual (two-parameter) normal distribution, based on a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact median statistical bias-correction factor for generic est(csp) based on \( n_f \)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with actual Type I censoring that are presumed to have been randomly selected from a conceptual (two-parameter) normal distribution, based on a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact median statistical bias-correction factor for generic est(csp) based on \( n_{\text{total}} \)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with no censoring and that are presumed to have been randomly selected from conceptual (two-parameter) normal distribution, based on a ML analysis with Version LS statistical bias-correction factors and the exact median statistical bias-correction factor for generic est(csp)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with potential Type I censoring that are presumed to have been randomly selected from a conceptual (two-parameter) normal distribution in ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact median statistical bias-correction factor for generic est(csp)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with actual Type I censoring that are presumed to have been randomly selected from a conceptual two-parameter Weibull distribution, based on a ML analysis with an iteratively updated pragmatic multiplicative median statistical bias-correction factor for ML est(cdp2) and the associated iteratively updated approximate multiplicative statistical bias-correction factor for ML est(cdp1)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with no censoring and that are presumed to have been randomly selected from conceptual two-parameter Weibull distribution, based on a ML analysis with an empirical multiplicative median statistical bias-correction factor for ML est(cdp2) and the associated approximate multiplicative median statistical bias-correction factor for ML est(cdp1)

Computes the bias-corrected value for the coefficient of variation given life (endurance) datum values with potential Type I censoring that are presumed to have been randomly selected from a conceptual two-parameter Weibull distribution, based on a ML analysis with an iteratively updated pragmatic multiplicative median statistical bias-correction factor for ML est(cdp2) and the associated iteratively updated approximate multiplicative statistical bias-correction factor for ML est(cdp1)
<table>
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<td>Computes cumulative probability values for the conceptual binomial distribution - version 1</td>
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<td>BINOM2</td>
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<tr>
<td>C2DSWAST</td>
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<td>C2NSDDS</td>
<td>Employs Bartlett’s LR test statistic to discern between three alternative presumed conceptual (two-parameter) normal fatigue strength (response) distribution models by conducting on ML analyses for two sets of strength (response) datum values that were allegedly generated in a CRD experiment test program</td>
<td>C2SDDADA</td>
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<td>C2SFNCM7</td>
<td>Employs Bartlett’s LR test statistic to discern between three alternative presumed $x_\alpha$ log$<em>e$[fnz(50)] models with conceptual (two-parameter) smallest-extreme-value fatigue strength distributions by conducting conditional ML analyses for two sets of $x</em>\alpha$ fnz datum values that were allegedly generated in a CRD experiment test program</td>
<td>C2SNDDATA</td>
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<td>CALESTCV</td>
<td>Calculates the elements of each column vector in the estimated complete analytical model</td>
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<td>CKSUMSQS</td>
<td>Checks the mutual orthogonality of the column vectors in the estimated complete analytical model by computing relevant sums of squares</td>
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<td>CSP</td>
<td>Computes the numerical value for Pearson’s central $\chi^2$ test statistic metric that corresponds to the probability p value of specific interest</td>
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<tr>
<td>EBCLCVNA</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual two-parameter log$_e$-normal distribution in ML analysis with the LS statistical bias correction for ML est(csp)</td>
<td>(LCVNCDATA)</td>
<td>(8.314)</td>
</tr>
<tr>
<td>EBCLCVNB</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual two-parameter log$_e$-normal distribution in ML analysis with the exact multiplicative mean statistical bias-correction factor for generic est(csp)</td>
<td>(LCVNCDATA)</td>
<td>(8.315)</td>
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<tr>
<td>EBCLCVNC</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual two-parameter log$_e$-normal distribution in ML analysis with the exact multiplicative median statistical bias-correction factor for generic est(csp)</td>
<td>(LCVNCDATA)</td>
<td>(8.316)</td>
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<tr>
<td>EBCLCVNN</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual two-parameter log$_e$-normal distribution in ML analysis with no statistical bias-correction for ML est(csp)</td>
<td>(LCVNCDATA)</td>
<td>(8.313)</td>
</tr>
<tr>
<td>EBCNCVNA</td>
<td>Computes simulation-based additive empirical bias corrections for the estimated coefficient of variation given no censoring and assuming a conceptual (two-parameter) normal distribution in ML analysis with the LS statistical bias correction for ML est(csp)</td>
<td>(NCVNCDATA)</td>
<td>(8.310)</td>
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<tr>
<td>EBCNCVNB</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual (two-parameter) normal distribution in ML analysis with the exact multiplicative mean statistical bias-correction factor for generic est(csp)</td>
<td>(NCVNCDATA)</td>
<td>(8.311)</td>
</tr>
<tr>
<td>EBCNCVNC</td>
<td>Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and assuming a conceptual (two-parameter) normal distribution in ML analysis with the exact multiplicative median statistical bias-correction factor for generic est(csp)</td>
<td>(NCVNCDATA)</td>
<td>(8.312)</td>
</tr>
</tbody>
</table>
Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and presuming a conceptual (two-parameter) normal distribution in ML analysis with no statistical bias correction for ML est(csp) (NCVNCDTA) (8.309)

Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and presuming a conceptual two-parameter Weibull distribution in ML analysis with empirical multiplicative statistical bias correction factors for its cdp’s obtained by running microcomputer program WMLEBCNN (WCVNADTA) & (WCVNBDTA) (8.318) & (8.320)

Computes simulation-based additive empirical bias corrections for the ML-based coefficient of variation given no censoring and presuming a conceptual two-parameter Weibull distribution in ML analysis with empirical additive statistical bias correction factors for its cdp’s obtained by running microcomputer program EBCWCVNN (WCVNCNTA) & (WCVNCNTB) (8.317) & (8.321)

Performs an enumeration-based signed-rank test given paired-comparison datum values (EXPCDTA1) 3.7

Performs an enumeration-based sign test given paired-comparison test datum values (EXPCDTA1) 3.5

Computes the extrapolation-based pragmatic estimate of the actual value for fnc(50) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[fnc(50)], given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on n_f (LN50DTAA) 8.93

Computes the extrapolation-based pragmatic estimate of the actual value for fnc(50) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[fnc(50)], given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on n_total (LN50DTAA) 8.94

Computes the extrapolation-based pragmatic estimate of the actual value for fnc(50) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[fnc(50)], given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections (LN50DTAA) 8.92

Computes the extrapolation-based pragmatic estimate of the actual value for fnc(50) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[fnc(50)], given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(csp) (LN50DTAN) 8.82
ELN50NCN  Computes the extrapolation-based pragmatic estimate of the actual value for \( fnc(50) \) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[\( fnc(50) \)], given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

(LN50DTAN)  8.81

ELN50PC1  Computes the extrapolation-based pragmatic estimate of the actual value for \( fnc(50) \) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[\( fnc(50) \)], given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\( csp \))

(LN50DTAP)  8.102

ELN50PCN  Computes the extrapolation-based pragmatic estimate of the actual value for \( fnc(50) \) based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[\( fnc(50) \)], given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

(LN50DTAP)  8.101

ELNCLAC1  Computes the extrapolation-based pragmatic lower 100(\( scp \))% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for this lower 100(\( scp \))% (one-sided) statistical confidence limit computed using Student’s central t, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\( csp \)) based on \( n_f \)

(LNCLDTAA)  8.90

ELNCLAC2  Computes the extrapolation-based pragmatic lower 100(\( scp \))% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for this lower 100(\( scp \))% (one-sided) statistical confidence limit computed using Student’s central t, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\( csp \)) based on \( n_{total} \)

(LNCLDTAA)  8.91

ELNCLACN  Computes the extrapolation-based pragmatic lower 100(\( scp \))% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for this lower 100(\( scp \))% (one-sided) statistical confidence limit computed using Student’s central t, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

(LNCLDTAA)  8.89
Computes the extrapolation-based pragmatic lower 100\(scp\)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for this lower 100\(scp\)% (one-sided) statistical confidence limit computed using Student's central \(t\), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est\((csp)\)

\[(LNCLDTAN)\] 8.80

ELNCLNC1

Computes the extrapolation-based pragmatic lower 100\(scp\)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for this lower 100\(scp\)% (one-sided) statistical confidence limit computed using Student’s central \(t\), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

\[(LNCLDTAN)\] 8.79

ELNCLNCN

Computes the extrapolation-based pragmatic lower 100\(scp\)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for this lower 100\(scp\)% (one-sided) statistical confidence limit computed using Student’s central \(t\), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est\((csp)\)

\[(LNCLDTAP)\] 8.100

ELNCLPC1

Computes the extrapolation-based pragmatic lower 100\(scp\)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for this lower 100\(scp\)% (one-sided) statistical confidence limit computed using Student’s central \(t\), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

\[(LNCLDTAP)\] 8.99

ELNCLPCN

Computes the extrapolation-based pragmatic \(A\)-basis or \(B\)-basis statistical tolerance limit that allegedly bounds the actual value for \(fnc(01)\) or \(fnc(10)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the associated \(A\)-basis or \(B\)-basis statistical tolerance limit computed using Student’s non-central \(t\), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias corrections and an extrapolated exact multiplicative median statistical bias-correction factor for generic est\((csp)\) based on \(n_f\)

\[(LNTLDAA)\] 8.84 & 8.87

ELNTLAC1

Computes the extrapolation-based pragmatic \(A\)-basis or \(B\)-basis statistical tolerance limit that allegedly bounds the actual value for \(fnc(01)\) or \(fnc(10)\), based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the associated \(A\)-basis or \(B\)-basis statistical tolerance limit computed using Student’s non-central \(t\), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log\(_e\)-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est\((csp)\) based on \(n_{total}\)

\[(LNTLDAA)\] 8.85 & 8.88

ELNTLAC2
ELNTLACN
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for fnic(01) or fnic(10), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the associated A-basis or B-basis statistical tolerance limit computed using Student’s non-central t, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

ELNTINCI
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for fnic(01) or fnic(10), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the associated A-basis or B-basis statistical tolerance limit computed using Student’s non-central t, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors the exact multiplicative median statistical bias-correction factor for generic est(csp)

ELNTINCN
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for fnic(01) or fnic(10), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the associated A-basis or B-basis statistical tolerance limit computed using Student’s non-central t, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

ELNTLPC1
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for fnic(01) or fnic(10), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the associated A-basis or B-basis statistical tolerance limit computed using Student’s non-central t, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

ELNTLPCN
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for fnic(01) or fnic(10), based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the associated A-basis or B-basis statistical tolerance limit computed using Student’s non-central t, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

ERCB2143
Performs an enumeration-based version of classical ANOVA for an unreplicated RCBD experiment test program with a (2)^P factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the c\text{t}1\text{t}2\text{c}esc is equal to zero and presuming that the actual value for the c\text{t}1\text{t}2\text{i}\text{t}2\text{e} is equal to zero

ERCB3412
Performs an enumeration-based version of classical ANOVA for an unreplicated RCBD experiment test program with a (2)^P factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the c\text{t}2\text{t}2\text{c}esc is equal to zero and presuming that the actual value for the c\text{t}1\text{t}2\text{i}\text{t}2\text{e} is equal to zero

(C6RDATA2 & C6RARRAY2) (6.36)

(C6RDATA3 & C6RARRAY3) (6.36)
Compu...e the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a-fnc}$ datum values with actual Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$ based on $n_{f}$.

Compu...e the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a-fnc}$ datum values with actual Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$ based on $n_{total}$.

Compu...e the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a-fnc}$ datum values with no censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$.

Compu...e the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a-fnc}$ datum values with no censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Compu...e the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a-fnc}$ datum values with potential Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$.

xvi
Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with potential Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a linear $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

ESN501PN

Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with actual Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_f$

ESN502A1

Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with actual Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{total}$

ESN502A2

Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with actual Type I censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

ESN502AN

Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with no censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est($csp$)

ESN502N1

Computes the extrapolation-based pragmatic estimate of the actual value for $s_f(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for est[$s_f(50)$], given $s_{a-fnc}$ datum values with no censoring and assuming a straight-line $s_{a-log_e[fnc(pf)]]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

ESN502NN
Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with potential Type I censoring and assuming a straight-line \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \)

(SN50DTAP) 8.207

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Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with potential Type I censoring and assuming a straight-line \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

(SN50DTAP) 8.206

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Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with actual Type I censoring and assuming a parabolic \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( n_{f} \)

(SN50DTAA) 8.178

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Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with actual Type I censoring and assuming a parabolic \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( n_{total} \)

(SN50DTAA) 8.179

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Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with actual Type I censoring and assuming a parabolic \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

(SN50DTAA) 8.177

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Computes the extrapolation-based pragmatic estimate of the actual value for \( s_{f}(50) \) given the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 "replicate" realization values for \( est[s_{f}(50)] \), given \( s_{\alpha-fnc} \) datum values with no censoring and assuming a parabolic \( s_{\alpha-\log_{e}[fnc(pf)]] \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic \( est(csp) \)

(SN50DTAN) 8.134
Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f0}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for est($s_{f0}(50)$), given $s_{a,fnc}$ datum values with no censoring and presuming a parabolic $s_{a,\text{log}_e[fnc(p)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

SN50DTAN 8.133

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f0}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 "replicate" realization values for est($s_{f0}(50)$), given $s_{a,fnc}$ datum values with potential Type I censoring and presuming a parabolic $s_{a,\text{log}_e[fnc(p)]}$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$).

SN50DTAP 8.215

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f0}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for est($s_{f0}(50)$), given $s_{a,fnc}$ datum values with actual Type I censoring and presuming a straight-line $s_{a,\text{log}_e[fnc(p)]}$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_f$.

SN50DTAA 8.190

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f0}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for est($s_{f0}(50)$), given $s_{a,fnc}$ datum values with actual Type I censoring and presuming a parabolic $s_{a,\text{log}_e[fnc(p)]}$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{total}$.

SN50DTAA 8.191

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f0}(50)$ given the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for est($s_{f0}(50)$), given $s_{a,fnc}$ datum values with actual Type I censoring and presuming a parabolic $s_{a,\text{log}_e[fnc(p)]}$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

SN50DTAA 8.189
Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^{*}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a^{-}}fnc$ datum values with no censoring and presuming a parabolic $s_{a^{-}}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^{*}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a^{-}}fnc$ datum values with no censoring and presuming a parabolic $s_{a^{-}}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^{*}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a^{-}}fnc$ datum values with potential Type I censoring and presuming a parabolic $s_{a^{-}}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$

Computes the extrapolation-based pragmatic estimate of the actual value for $s_{f}(50)$ given the $fnc^{*}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of 30000 “replicate” realization values for $\text{est}(s_{f}(50))$, given $s_{a^{-}}fnc$ datum values with potential Type I censoring and presuming a parabolic $s_{a^{-}}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes the extrapolation-based pragmatic lower 100$(scp)^{\%}$ statistical confidence limit that allegedly bounds the actual value for $s_{f}(50)$ at the $fnc^{*}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100$(scp)^{\%}$ (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f}(50)$ computed using Student’s central $t$, given $s_{a^{-}}fnc$ datum values with actual Type I censoring and presuming a straight-line $s_{a^{-}}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $\text{est}(csp)$ based on $n_{f}$
Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for $s_{\beta}(50)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\beta}(50)$ computed using Student’s central t, given $s_\alpha^{fnc}$ datum values with actual Type I censoring and presuming a straight-line $s_\alpha^{\log_\rho(fnc(pf))}$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cpsp) based on $n_{\text{total}}$.

**ESNCLIA2**

(SNCLDTAAA) 8.152

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for $s_{\beta}(50)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\beta}(50)$ computed using Student’s central t, given $s_\alpha^{fnc}$ datum values with actual Type I censoring and presuming a straight-line $s_\alpha^{\log_\rho(fnc(pf))}$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

**ESNCLIAN**

(SNCLDTAAA) 8.150

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for $s_{\beta}(50)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\beta}(50)$ computed using Student’s central t, given $s_\alpha^{fnc}$ datum values with no censoring and presuming a straight-line $s_\alpha^{\log_\rho(fnc(pf))}$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cpsp).

**ESNCLIN1**

(SNCLDTAN) 8.116

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for $s_{\beta}(50)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\beta}(50)$ computed using Student’s central t, given $s_\alpha^{fnc}$ datum values with no censoring and presuming a straight-line $s_\alpha^{\log_\rho(fnc(pf))}$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

**ESNCLINN**

(SNCLDTAN) 8.115

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Computes the extrapolation-based pragmatic lower 100(\textit{scp})\% statistical confidence limit that allegedly bounds the actual value for \( s_{50}(50) \) at the\( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\textit{scp})\% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{50}(50) \) computed using Student’s central \( t \), given \( s_{\alpha-fnc} \) datum values with potential \textit{Type I} censoring and presuming a straight-line \( s_{\alpha-log_{e}[fnc(pf)داده‌ام]} \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \)

ESNCL1P1

ESNCL1PN

ESNCL2A1

ESNCL2A2

(SNCLDTAP) 8.197

(SNCLDTAP) 8.196

(SNCLDTAA) 8.163

(SNCLDTAA) 8.164

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ESNL2AN

Computes the extrapolation-based pragmatic lower \(100(scp)\%\) statistical confidence limit that allegedly bounds the actual value for \(s_{\alpha}(50)\) at the \(fnc^*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower \(100(scp)\%\) (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\alpha}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}fnc\) datum values with actual Type I censoring and presuming a straight-line \(s_{\alpha}\log_e[fnc(pf)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

(SNCLDTAA) 8.162

ESNL2N1

Computes the extrapolation-based pragmatic lower \(100(scp)\%\) statistical confidence limit that allegedly bounds the actual value for \(s_{\alpha}(50)\) at the \(fnc^*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower \(100(scp)\%\) (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\alpha}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}fnc\) datum values with no censoring and presuming a straight-line \(s_{\alpha}\log_e[fnc(pf)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cps)

(SNCLDTAN) 8.124

ESNL2NN

Computes the extrapolation-based pragmatic lower \(100(scp)\%\) statistical confidence limit that allegedly bounds the actual value for \(s_{\alpha}(50)\) at the \(fnc^*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower \(100(scp)\%\) (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\alpha}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}fnc\) datum values with no censoring and presuming a straight-line \(s_{\alpha}\log_e[fnc(pf)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

(SNCLDTAN) 8.123

ESNL2P1

Computes the extrapolation-based pragmatic lower \(100(scp)\%\) statistical confidence limit that allegedly bounds the actual value for \(s_{\alpha}(50)\) at the \(fnc^*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower \(100(scp)\%\) (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\alpha}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}fnc\) datum values with potential Type I censoring and presuming a straight-line \(s_{\alpha}\log_e[fnc(pf)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cps)

(SNCLDTAP) 8.205

ESNL2PN

Computes the extrapolation-based pragmatic lower \(100(scp)\%\) statistical confidence limit that allegedly bounds the actual value for \(s_{\alpha}(50)\) at the \(fnc^*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower \(100(scp)\%\) (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\alpha}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}fnc\) datum values with potential Type I censoring and presuming a straight-line \(s_{\alpha}\log_e[fnc(pf)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

(SNCLDTAP) 8.204
 Computes the extrapolation-based pragmatic lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{f_0}(50)\) at the \(fnc^{*}\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\(scp\))% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{f_0}(50)\) computed using Student’s central t, given \(s_{o-fnc}\) datum values with actual Type I censoring and presuming a parabolic \(s_{o-loge[\text{fnc}(pf)]]}\) model with a linear \(s_{o}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\)) based on \(n_{f}\)

Computes the extrapolation-based pragmatic lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{f_0}(50)\) at the \(fnc^{*}\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\(scp\))% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{f_0}(50)\) computed using Student’s central t, given \(s_{o-fnc}\) datum values with actual Type I censoring and presuming a parabolic \(s_{o-loge[\text{fnc}(pf)]]}\) model with a linear \(s_{o}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\)) based on \(n_{total}\)

Computes the extrapolation-based pragmatic lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{f_0}(50)\) at the \(fnc^{*}\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\(scp\))% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{f_0}(50)\) computed using Student’s central t, given \(s_{o-fnc}\) datum values with actual Type I censoring and presuming a parabolic \(s_{o-loge[\text{fnc}(pf)]]}\) model with a linear \(s_{o}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes the extrapolation-based pragmatic lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{f_0}(50)\) at the \(fnc^{*}\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\(scp\))% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{f_0}(50)\) computed using Student’s central t, given \(s_{o-fnc}\) datum values with no censoring and presuming a parabolic \(s_{o-loge[\text{fnc}(pf)]]}\) model with a linear \(s_{o}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\))
Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for \( s_{f_0}(50) \) at the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{f_0}(50) \) computed using Student’s central t, given \( s_{\alpha}^{fnc} \) datum values with no censoring and presuming a parabolic \( s_{\alpha}^{\log f_{[fnc[pf]]}} \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

ESNCL3P1

\[ \text{(SNCLDTAP)} \quad 8.213 \]

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for \( s_{f_0}(50) \) at the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{f_0}(50) \) computed using Student’s central t, given \( s_{\alpha}^{fnc} \) datum values with potential Type I censoring and presuming a parabolic \( s_{\alpha}^{\log f_{[fnc[pf]]}} \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cps).

ESNCL3PN

\[ \text{(SNCLDTAP)} \quad 8.212 \]

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for \( s_{f_0}(50) \) at the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{f_0}(50) \) computed using Student’s central t, given \( s_{\alpha}^{fnc} \) datum values with potential Type I censoring and presuming a parabolic \( s_{\alpha}^{\log f_{[fnc[pf]]}} \) model with a linear \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

ESNCL4A1

\[ \text{(SNCLDTAA)} \quad 8.187 \]

Computes the extrapolation-based pragmatic lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for \( s_{f_0}(50) \) at the \( fnc^* \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{f_0}(50) \) computed using Student’s central t, given \( s_{\alpha}^{fnc} \) datum values with actual Type I censoring and presuming a parabolic \( s_{\alpha}^{\log f_{[fnc[pf]]}} \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(cps) based on \( sf \).
Computes the extrapolation-based pragmatic lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\beta}(50)\) at the \(f_{nc}\*\) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\(scp\))% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \(s_{\beta}(50)\) computed using Student’s central \(t\), given \(s_{\alpha}-f_{nc}\) datum values with actual Type I censoring and presuming a parabolic \(s_{\alpha}-\log_{e}[f_{nc}(p)]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extraplated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\)) based on \(n_{total}\)

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PSNCL4A2
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ESNCL4AN
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ESNCL4AN1
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ESNCL4NN
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Computes the extrapolation-based pragmatic lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for $s_f(50)$ at the $\text{finc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\text{scp})\% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_f(50)$ computed using Student’s central $t$, given $s_f^{\text{finc}}$ datum values with potential Type I censoring and presuming a parabolic $s_\alpha^{\text{log}e[\text{finc}(pf)\}]$ model with a logarithmic $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

Computes the extrapolation-based pragmatic lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for $s_f(50)$ at the $\text{finc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 100(\text{scp})\% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_f(50)$ computed using Student’s central $t$, given $s_f^{\text{finc}}$ datum values with potential Type I censoring and presuming a parabolic $s_\alpha^{\text{log}e[\text{finc}(pf)\}]$ model with a logarithmic $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_f(01)$ or $s_f(10)$ at the $\text{finc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_f(01)$ or $s_f(10)$ computed using Student’s non-central $t$, given $s_f^{\text{finc}}$ datum values with actual Type I censoring and presuming a straight-line $s_\alpha^{\text{log}e[\text{finc}(pf)\}]$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $nf$

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_f(01)$ or $s_f(10)$ at the $\text{finc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_f(01)$ or $s_f(10)$ computed using Student’s non-central $t$, given $s_f^{\text{finc}}$ datum values with actual Type I censoring and presuming a straight-line $s_\alpha^{\text{log}e[\text{finc}(pf)\}]$ model with a linear $s_\alpha$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_{total}$
Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{g}(01)$ or $s_{g}(10)$ computed using Student’s non-central t, given $s_{a,fnc}$ datum values with actual Type I censoring and presuming a straight-line $s_{a}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{g}(01)$ or $s_{g}(10)$ computed using Student’s non-central t, given $s_{a,fnc}$ datum values with no censoring and presuming a straight-line $s_{a}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{g}(01)$ or $s_{g}(10)$ computed using Student’s non-central t, given $s_{a,fnc}$ datum values with no censoring and presuming a straight-line $s_{a}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{g}(01)$ or $s_{g}(10)$ computed using Student’s non-central t, given $s_{a,fnc}$ datum values with potential Type I censoring and presuming a straight-line $s_{a}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{g}(01)$ or $s_{g}(10)$ computed using Student’s non-central t, given $s_{a,fnc}$ datum values with potential Type I censoring and presuming a straight-line $s_{a}\log_{e}[fnc(pf)]$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections
Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}$ or $s_{f_{10}}$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}$ or $s_{f_{10}}$ computed using Student’s non-central $t$, given $s_{a,n}^{-}fnc$ datum values with actual Type I censoring and presuming a straight-line $s_{a,n}^{-}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_f$

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}$ or $s_{f_{10}}$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}$ or $s_{f_{10}}$ computed using Student’s non-central $t$, given $s_{a,n}^{-}fnc$ datum values with actual Type I censoring and presuming a straight-line $s_{a,n}^{-}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_{total}$

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}$ or $s_{f_{10}}$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}$ or $s_{f_{10}}$ computed using Student’s non-central $t$, given $s_{a,n}^{-}fnc$ datum values with actual Type I censoring and presuming a straight-line $s_{a,n}^{-}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}$ or $s_{f_{10}}$ at the $fnc^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}$ or $s_{f_{10}}$ computed using Student’s non-central $t$, given $s_{a,n}^{-}fnc$ datum values with no censoring and presuming a straight-line $s_{a}^{-}\log_{e}[fnc(pf)]$ model with a logarithmic $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{\theta}(01)$ or $s_{\theta}(10)$ at the $f_{nc}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\theta}(01)$ or $s_{\theta}(10)$ computed using Student’s non-central t, given $s_{\theta}-fnc$ datum values with no censoring and assuming a straight-line $s_{\theta}-\log_{e}[fnc(pf)]$ model with a logarithmic $s_{\theta}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections.

SNTLDTAN

8.119

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8.121

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{\theta}(01)$ or $s_{\theta}(10)$ at the $f_{nc}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\theta}(01)$ or $s_{\theta}(10)$ computed using Student’s non-central t, given $s_{\theta}-fnc$ datum values with potential Type I censoring and assuming a straight-line $s_{\theta}-\log_{e}[fnc(pf)]$ model with a logarithmic $s_{\theta}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $ext(csp)$.

SNTLDTAP

8.201

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8.203

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{\theta}(01)$ or $s_{\theta}(10)$ at the $f_{nc}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\theta}(01)$ or $s_{\theta}(10)$ computed using Student’s non-central t, given $s_{\theta}-fnc$ datum values with potential Type I censoring and assuming a straight-line $s_{\theta}-\log_{e}[fnc(pf)]$ model with a logarithmic $s_{\theta}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections.

SNTLDTAP

8.200

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8.202

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{\theta}(01)$ or $s_{\theta}(10)$ at the $f_{nc}$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{\theta}(01)$ or $s_{\theta}(10)$ computed using Student’s non-central t, given $s_{\theta}-fnc$ datum values with actual Type I censoring and assuming a parabolic $s_{\theta}-\log_{e}[fnc(pf)]$ model with a linear $s_{\theta}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $ext(csp)$ based on $nf$.

SNTLDTAA

8.169

&

8.172
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f80}$ at the $fnc$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f80}$ computed using Student’s non-central $t$, given $s_{f80}$ datum values with actual Type I censoring and assuming a parabolic $s_{f80}$-[fns] model with a linear $s_{f80}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_{total}$.

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f80}$ at the $fnc$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f80}$ computed using Student’s non-central $t$, given $s_{f80}$-[fns] datum values with actual Type I censoring and assuming a parabolic $s_{f80}$-[fns] model with a linear $s_{f80}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections.

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f80}$ at the $fnc$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f80}$ computed using Student’s non-central $t$, given $s_{f80}$-[fns] datum values with no censoring and assuming a parabolic $s_{f80}$-[fns] model with a linear $s_{f80}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp).

Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f80}$ at the $fnc$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f80}$ computed using Student’s non-central $t$, given $s_{f80}$-[fns] datum values with no censoring and assuming a parabolic $s_{f80}$-[fns] model with a linear $s_{f80}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections.
Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}(1)$ or $s_{f_{01}}(10)$ at the $f_{nc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ computed using Student's non-central $t$, given $s_a$-$f_{nc}$ datum values with potential Type I censoring and presuming a parabolic $s_a$-$\log_e(f_{nc}(pf))$ model with a linear $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ at the $f_{nc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ computed using Student's non-central $t$, given $s_a$-$f_{nc}$ datum values with potential Type I censoring and presuming a parabolic $s_a$-$\log_e(f_{nc}(pf))$ model with a linear $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ at the $f_{nc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ computed using Student's non-central $t$, given $s_a$-$f_{nc}$ datum values with actual Type I censoring and presuming a parabolic $s_a$-$\log_e(f_{nc}(pf))$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$ based on $n_f$

Computes the extrapolation-based pragmatic $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ at the $f_{nc}^*$ value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 “replicate” realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this $s_{f_{01}}(01)$ or $s_{f_{01}}(10)$ computed using Student's non-central $t$, given $s_a$-$f_{nc}$ datum values with actual Type I censoring and presuming a parabolic $s_a$-$\log_e(f_{nc}(pf))$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$ based on $n_{total}$
Computes the extrapolation-based pragmatic A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for \( s_{f_h}(0) \) or \( s_{f_h}(10) \) at the \( fnc^\star \) value of specific interest, based on the median of the pragmatic sampling distribution comprised of up to 30000 "replicate" realization values for the lower 95% (one-sided) statistical confidence limit that allegedly bounds the actual value for this \( s_{f_h}(0) \) or \( s_{f_h}(10) \) computed using Student's non-central t, given \( s_{n-fnc} \) datum values with actual Type I censoring and presuming a parabolic \( s_{a-log}_e[fnc(pf)] \) model with a logarithmic \( s_a \) metric and a homocedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no bias corrections.

\[ (SNTLDTA) \]

\[ 8.180 \]

\[ \& \]

\[ 8.183 \]

\[ (SNTLDTAN) \]

\[ 8.136 \]

\[ \& \]

\[ 8.138 \]

\[ (SNTLDTAN) \]

\[ 8.135 \]

\[ \& \]

\[ 8.137 \]

\[ (SNTLDTAP) \]

\[ 8.217 \]

\[ \& \]

\[ 8.219 \]

\[ (SNTLDTAP) \]

\[ 8.216 \]

\[ \& \]

\[ 8.218 \]
ESPD2143

Performs an enumeration-based version of classical ANOVA for an unreplicated split-plot experiment test program with a \( (2)^3 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \textit{cspstesc} is equal to zero and presuming that the actual value for the \textit{cmptspiec} is equal to zero

\( (C6RDATA4 & C6RARRAY4) \) (6.37)

ESPD3412

Performs an enumeration-based version of classical ANOVA for an unreplicated split-plot experiment test program with a \( (2)^3 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \textit{cspstesc} is equal to zero and presuming that the actual value for the \textit{cmptspiec} is equal to zero

\( (C6RDATA5 & C6RARRAY5) \) (6.37)

FCOIN1

Simulates flipping a fair coin - version 1

Prompt 3.15

FCOIN2

Simulates flipping a fair coin - version 2

Prompt 3.17

FEBMPDT

Performs Fisher’s enumeration-based test given paired-comparison datum values, for any value for the minimum practical difference \textit{mpd} of specific interest

\( (FEMPDDTA) \) 3.40

FEBT

Performs Fisher’s enumeration-based test given paired-comparison datum values

\( (EXPCDTA1) \) 3.7

FP

Computes the numerical value for Snedecor’s central F test statistic metric that corresponds to the probability \( p \) value of specific interest

Prompt (5.23)

FRBT

Performs Fisher’s randomization-based test given paired-comparison datum values

\( (EXRBPCDI) \) 3.11

HISTPRO1

Generates histogram data for the observed proportions in ten equal-width intervals for 1,000 uniformly distributed pseudorandom numbers, zero to one

Prompt 3.21

HISTPRO2

Generates histogram data for the observed proportions in ten equal-width intervals for 100,000 uniformly distributed pseudorandom numbers, zero to one

Prompt 3.21

IBPSCI

Computes an intuitive 100(scp)\% (two-sided) statistical confidence interval that allegedly includes the actual value for the fixed binomial probability that each binomial trial (paired-comparison, reliability test) \textit{a priori} will generate a favorable outcome

Prompt 8.20

ISLRCLNS

Computes so-called inverse simple linear regression statistical confidence limits, provided that the actual value for the \textit{clpl} is markedly negative

\( (IRNSDATA) \) 7.26

ISLRCLPS

Computes so-called inverse simple linear regression statistical confidence limits, provided that the actual value for the \textit{clpl} is markedly positive

\( (IRPSDATA) \) 7.25

ISLRTLNS

Computes so-called inverse simple linear regression statistical tolerance limits, provided that the actual value for the \textit{clpl} is markedly negative

\( (IRNSDATA) \) 7.26

ISLRTLPS

Computes so-called inverse simple linear regression statistical tolerance limits, provided that the actual value for the \textit{clpl} is markedly positive

\( (IRPSDATA) \) 7.26

L1A

Performs a maximum likelihood analysis presuming a conceptual “one parameter” logistic strength (resistance) distribution and computes the Method Two and LR-based lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s(50) \)

\( UADDDATA \) 8.38

L2ALCL

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) logistic strength (resistance) distribution and computes the Method One and Method Two lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( s(pf) \)

\( (ASDDDATA) \) 8.288

L2AS50

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) logistic strength (resistance) distribution and computes the Method Two lower 100(scp)\% (one-sided) asymptotic statistical confidence limit that allegedly bounds the actual value for \( s(50) \) using Student’s central t
L2B
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) logistic strength (resistance) distribution and computes two
alternative numerical lower 100(scp)% (one-sided) asymptotic statistical
confidence bands that allegedly bound the actual CDF

L2C
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) logistic strength (resistance) distribution and computes two
alternative numerical lower 100(scp)% (one-sided) asymptotic statistical
certainty limits that allegedly bound the actual value for s(pf)

LEV
Generates pseudorandom datum values from a conceptual (two-parameter)
largest-extreme-value distribution given numerical values for its mean and
standard deviation

LEV1A
Performs a maximum likelihood analysis presuming a conceptual
"one-parameter" largest-extreme-value strength (resistance) distribution and
computes the Method Two and LR-based lower 100(scp)% (one-sided)
asymptotic statistical confidence limits that allegedly bound the actual value for
s(50)

LEV2ALCL
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) largest-extreme-value strength (resistance) distribution and
computes the Method One and Method Two lower 100(scp)% (one-sided)
asymptotic statistical confidence limits that allegedly bound the actual value for
s(pf)

LEV2AS50
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) largest-extreme-value strength (resistance) distribution and
computes the Method Two lower 100(scp)% (one-sided) statistical confidence
limit that allegedly bounds the actual value for s(50) using Student's central t

LEV2B
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) largest-extreme-value strength (resistance) distribution and
computes two alternative numerical lower 100(scp)% (one-sided) asymptotic
statistical confidence bands that allegedly bound the actual CDF

LEV2C
Performs a maximum likelihood analysis presuming a conceptual
(two-parameter) largest-extreme-value strength (resistance) distribution and
computes two alternative numerical lower 100(scp)% (one-sided) asymptotic
statistical confidence limits that allegedly bound the actual value for s(pf)

LN1AACN
Performs a maximum likelihood analysis with no statistical bias corrections,
given actual Type I censoring and presuming a conceptual two-parameter
log-normal life (endurance) distribution with parameterization 1, and computes
the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical
confidence limits that allegedly bound the actual value for the fmc(pf)
of specific interest

LN1BACN
Performs a maximum likelihood analysis with no statistical bias corrections,
given actual Type I censoring and presuming a conceptual two-parameter
log-normal life (endurance) distribution with parameterization 1, and computes
two alternative numerical lower 100(scp)% (one-sided) asymptotic statistical
confidence bands that allegedly bound the actual conceptual CDF

LN1CACN
Performs a maximum likelihood analysis with no statistical bias corrections,
given actual Type I censoring and presuming a conceptual two-parameter
log-normal life (endurance) distribution with parameterization 1, and computes
two alternative lower 100(scp)% (one-sided) asymptotic statistical confidence
limits that allegedly bound the actual value for the fmc(pf) of specific interest
Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 2, and computes the Method One and Method Two lower 100(scep)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the $fnc(\phi_f)$ of specific interest

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 2, and computes two alternative numerical lower 100(scep)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 2, and computes two alternative numerical lower 100(scep)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the $fnc(\phi_f)$ of specific interest

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes the Method One and Method Two lower 100(scep)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the $fnc(\phi_f)$ of specific interest

Performs a maximum likelihood analysis with Version LS statistical bias correction factors, given no censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes the Method Two lower 100(scep)% (one-sided) asymptotic statistical confidence limit that allegedly bounds the actual value for the $fnc(\phi_f)$ of specific interest

Performs a maximum likelihood analysis with no statistical bias corrections, given no censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes the Method Two lower 100(scep)% (one-sided) asymptotic statistical confidence limit that allegedly bounds the actual value for the $fnc(\phi_f)$ of specific interest

Performs a maximum likelihood analysis with Version LS statistical bias correction factors, given no censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes an exact (unbiased) lower 100(scep)% (one-sided) statistical tolerance limit that allegedly bounds the actual value for the $fnc(\phi_f)$ of specific interest using Student's non-central t

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes two alternative numerical lower 100(scep)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log$_e$-normal life (endurance) distribution with parameterization 3, and computes two alternative numerical lower 100(scep)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the $fnc(\phi_f)$ of specific interest
Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter logₐ-normal life (endurance) distribution with parameterization 4, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( \text{fnC(pf)} \) of specific interest

\[ \text{LN4AACN} \quad (LNDATAAC) \quad 8.67 \]

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter logₐ-normal life (endurance) distribution with parameterization 4, and computes two alternative numerical lower 100(scp)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF

\[ \text{LN4BACN} \quad (LNDATAAC) \quad 8.490 \]

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter logₐ-normal life (endurance) distribution with parameterization 4, and computes two alternative numerical lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( \text{fnC(pf)} \) of specific interest

\[ \text{LN4CACN} \quad (LNDATAAC) \quad 8.520 \]

Computes numerical values for the \( cdp1 \) and the \( cdp2 \) given a conceptual two-parameter logₐ-normal distribution with given median and standard deviation

\[ \text{LN50CDPS} \quad \text{Prompt} \quad (-) \]

Performs a maximum likelihood analysis with no statistical bias corrections, given arbitrarily suspended replicate datum values and presuming a conceptual two-parameter logₐ-normal life (endurance) distribution with parameterization 3, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( \text{fnC(pf)} \) of specific interest

\[ \text{LNAREST} \quad (LNASDATA) \quad 8.104 \]

Computes numerical values for the \( cdp1 \) and the \( cdp2 \) given a conceptual two-parameter logₐ-normal distribution with given mean and standard deviation

\[ \text{LNORCDPS} \quad \text{Prompt} \quad (8.16) \]

Generates pseudorandom datum values from a conceptual two-parameter logₐ-normal distribution given numerical values for its mean and standard deviation

\[ \text{LOGENOR} \quad \text{Prompt} \quad (5.17) \]

Generates pseudorandom datum values from a conceptual (two-parameter) logistic distribution given numerical values for its mean and standard deviation

\[ \text{LOGISTIC} \quad \text{Prompt} \quad (5.17) \]

Computes the LR-based 100(scp)% (two-sided) statistical confidence interval that allegedly includes the actual value for the invariant binomial probability that any given binomial trial (paired-comparison, reliability test) will generate a favorable outcome

\[ \text{LRBBPSCL} \quad \text{Prompt} \quad 8.20 \]

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual (two-parameter) logₐ-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 1, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( \text{fnC(pf)} \) of specific interest

\[ \text{LSEV1AAC} \quad \text{WBLDTAAC} \quad 8.30 \]

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter logₐ-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 1, and computes two alternative numerical lower 100(scp)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF

\[ \text{LSEV18AC} \quad \text{WBLDTAAC} \quad 8.483 \]
Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 1, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV1CAC**  
**WBLDTAAC**  
8.517

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual (two-parameter) \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 2, and computes the Method One and Method Two lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV2AAC**  
**WBLDTAAC**  
8.30

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 2, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF.

**LSEV2BAC**  
**WBLDTAAC**  
8.484

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 2, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV2CAC**  
**WBLDTAAC**  
8.517

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual (two-parameter) \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 3, and computes the Method One and Method Two lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV3AAC**  
**WBLDTAAC**  
8.31

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 3, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF.

**LSEV3BAC**  
**WBLDTAAC**  
8.485

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 3, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV3CAC**  
**WBLDTAAC**  
8.518

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual (two-parameter) \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 4, and computes the Method One and Method Two lower 100(\(scp\))% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) of specific interest.

**LSEV4AAC**  
**WBLDTAAC**  
8.31

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter \( \log_e \)-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 4, and computes two alternative numerical lower 100(\(scp\))% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual conceptual CDF.

**LSEV4BAC**  
**WBLDTAAC**  
8.486
Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter log_{10}-smallest-extreme-value (Weibull) life (endurance) distribution with parameterization 4, and computes two alternative numerical lower 100(Seanl)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the f(x;pf) of specific interest

**LSEV4CAC**

**WBLDTAAC**

8.518

Computes a modified distribution-free (non-parametric) B-basis statistical tolerance limit

**MDFBBSTL**

**MDFDATA**

8.61

Computes a one-sided lower statistical confidence limit that allegedly bounds the actual value for the reliability, viz., for the invariant binomial probability that a test item will survive the reliability test of specific interest

**MINREL**

Prompt

3.38

Performs a maximum likelihood analysis presuming a conceptual “one-parameter” normal strength (resistance) distribution and computes the Method Two and LR-based lower 100(Seanl)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for s(50)

**N1A**

**UADDATA**

8.38

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) normal strength (resistance) distribution and computes the Method One and Method Two lower 100(Seanl)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the s(pf) of specific interest

**N2ALCL**

**ASDDATA**

8.288

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) normal strength (resistance) distribution and computes the Method Two lower 100(Seanl)% (one-sided) asymptotic statistical confidence limit that allegedly bounds the actual value for s(50) using Student’s central t

**N2AS59**

**ASDDATA**

8.287

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) normal strength (resistance) distribution and computes two alternative numerical lower 100(Seanl)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual CDF

**N2B**

**ASDDATA**

8.513

Performs a maximum likelihood analysis presuming a conceptual (two-parameter) normal strength (resistance) distribution and computes two alternative numerical lower 100(Seanl)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for s(pf)

**N2C**

**ASDDATA**

8.521

Computes exact mean and median multiplicate statistical bias-correction factors for generic est[stddev(X)] given n_{xv} normally distributed datum values, for n_{xv} from 4 to 32

**NDSDSBCF**

None Required

5.38

Generates pseudorandom datum values from a conceptual (two-parameter) normal distribution given numerical values for its mean and standard deviation

**NOR**

Prompt

5.16

Tests the null hypothesis of normality for replicate (allegedly replicate) datum values using a modified Michael’s MDSP test statistic

**NORTTEST**

**ANORDATA**

5.16

Tests the null hypothesis of normality for the est(CRHNDREE’s) pertaining to the multiple linear regression experiment test program that was actually conducted

**NTCMLRM**

(Same as **ATCMLRM**) (7.30)

Tests the null hypothesis of normality for the est(CRHNDREE’s) pertaining to the simple linear regression experiment test program that was actually conducted

**NTCSLRM**

**(NTSLRDTA)** (7.30)

Computes the optimal stimulus level s for the next test item, presuming a conceptual (two-parameter) normal strength distribution, viz., it computes the value for s that maximizes the value of the Method One asymptotic lower (one-sided) confidence limit that allegedly bounds the actual value for s(pf)

**OTPNLCLI**

**ASDDATA**

8.236
**OTPNLCL2**
Computes the optimal stimulus level $s$ for the next test item, presuming a conceptual (two-parameter) normal strength distribution, viz., it computes the value for $s$ that maximizes the value of the Method Two asymptotic lower (one-sided) confidence limit that allegedly bounds the actual value for $s(pf)$

**ASDDATA**
8.290

**PCS**
Computes the probability $p$ that corresponds to the numerical value for Pearson's central $\chi^2$ test statistic of specific interest

Prompt
(5.23)

**PF**
Computes the probability $p$ that corresponds to the numerical value for Snedecor's central $F$ test statistic of specific interest

Prompt
(5.23)

**PLNCLAC0**
Computes the simulation-based pragmatic bias-corrected lower 100($scp$)% (one-sided) statistical confidence limit that allegedly bounds the actual value for $fnc(50)$ of specific interest based on the 100($scp$)$^{th}$ percentile of the pragmatic sampling distribution comprised of 30000 Method Two lower 100($scp$)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $fnc(50)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $nf$

(LNCLDTAA)
8.386

**PLNCLAC1**
Computes the simulation-based pragmatic bias-corrected lower 100($scp$)% (one-sided) statistical confidence limit that allegedly bounds the actual value for $fnc(50)$ of specific interest based on the 100($scp$)$^{th}$ percentile of the pragmatic sampling distribution comprised of 30000 Method Two lower 100($scp$)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $fnc(50)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{total}$

(LNCLDTAA)
8.387

**PLNCLAC2**
Computes the simulation-based pragmatic bias-corrected lower 100($scp$)% (one-sided) statistical confidence limit that allegedly bounds the actual value for $fnc(50)$ of specific interest based on the 100($scp$)$^{th}$ percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 100($scp$)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $fnc(50)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

(LNCLDTAN)
8.385

**PLNCLACN**
Computes the simulation-based pragmatic bias-corrected lower 100($scp$)% (one-sided) statistical confidence limit that allegedly bounds the actual value for $fnc(50)$ of specific interest based on the 100($scp$)$^{th}$ percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 100($scp$)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $fnc(pf)$, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est($csp$)

(LNCLDTAN)
8.378
Computes the simulation-based pragmatic bias-corrected lower 100(scp)\% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\) of specific interest based on the 100(scp)\%th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(fnc(50)\), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.

\[
\text{PLNLCN}\quad \text{(LNCLDTAN)} \quad 8.377
\]

Computes the simulation-based pragmatic bias-corrected lower 100(scp)\% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\) of specific interest based on the 100(scp)\%th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(fnc(50)\), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(scp).

\[
\text{PLNLCPC1}\quad \text{(LNCLDTAP)} \quad 8.393
\]

Computes the simulation-based pragmatic bias-corrected lower 100(scp)\% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\) of specific interest based on the 100(scp)\%th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(fnc(50)\), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.

\[
\text{PLNLCPCN}\quad \text{(LNTLDTAP)} \quad 8.392
\]

Computes the simulation-based pragmatic bias-corrected lower 100(scp)\% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\) of specific interest based on the 100(scp)\%th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(fnc(50)\), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(scp) based on \(n_f\).

\[
\text{PLNCLR1}\quad \text{(LNCLDTAA)} \quad 8.504
\]

Computes the simulation-based pragmatic bias-corrected lower 100(scp)\% (one-sided) statistical confidence limit that allegedly bounds the actual value for \(fnc(50)\) of specific interest based on the 100(scp)\%th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(fnc(50)\), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(scp) based on \(n_{total}\).

\[
\text{PLNCLR2}\quad \text{(LNCLDTAA)} \quad 8.505
\]
Computes the simulation-based pragmatic bias-corrected lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \) of specific interest based on the 100(scp)\(^{th} \) percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( fnc(50) \), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter lognormal life (endurance) distribution in a ML analysis with no statistical bias corrections.

\( (LNCLDTAA) \)

8.503

Computes the simulation-based pragmatic bias-corrected lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \) of specific interest based on the 100(scp)\(^{th} \) percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( fnc(50) \), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter lognormal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(scp).

\( (LNCLDTAN) \)

8.496

Computes the simulation-based pragmatic bias-corrected lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \) of specific interest based on the 100(scp)\(^{th} \) percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( fnc(50) \), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter lognormal life (endurance) distribution in a ML analysis with no statistical bias corrections.

\( (LNCLDTAN) \)

8.495

Computes the simulation-based pragmatic bias-corrected lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \) of specific interest based on the 100(scp)\(^{th} \) percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( fnc(50) \) given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter lognormal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(scp).

\( (LNCLDTAP) \)

8.511

Computes the simulation-based pragmatic bias-corrected lower 100(scp)% (one-sided) statistical confidence limit that allegedly bounds the actual value for \( fnc(50) \) of specific interest based on the 100(scp)\(^{th} \) percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( fnc(50) \), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter lognormal life (endurance) distribution in a ML analysis with no statistical bias corrections.

\( (LNCLDTAP) \)

8.510
Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30,000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual $Type~I$ censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_f$.

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30,000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual $Type~I$ censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{total}$.

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30,000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual $Type~I$ censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30,000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est($csp$).

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30,000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.
Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

$PLNTLPC1$ ($LNTLDTAP$) 8.389 & 8.391

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 100(csp) % (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

$PLNTLPCN$ ($LNTLDTAP$) 8.388 & 8.390

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $nf$

$PLNTLRA1$ ($LNTLDTAA$) 8.498 & 8.501

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_{total}$

$PLNTLRA2$ ($LNTLDTAA$) 8.499 & 8.501

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with no statistical bias corrections

$PLNTLRAN$ ($LNTLDTAA$) 8.497 & 8.5000

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter log$_e$-normal life (endurance) distribution in a ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(csp)

$PLNTLRN1$ ($LNTLDTAN$) 8.492 & 8.494
Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.

$PLNTLRN$  
$LNTLDTAN$  
$LNTLDTAP$  

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$).

$PLNTLRP1$  
$LNTLDTAP$  
$LNTLDTAP$  

Computes the simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for $fnc(01)$ or $fnc(10)$, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 LR-based lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $fnc(01)$ or $fnc(10)$, given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter loge-normal life (endurance) distribution in a ML analysis with no statistical bias corrections.

$PLNTLRPN$  
$LNTLDTAP$  
$LNTLDTAP$  

Computes the minimum statistical power for a CRD experiment test program with equal replication.

$POWERCROD$  

Computes the minimum statistical power for a RCB experiment test program with equal replication.

$POWERRCB$  

Computes the simulation-based pragmatic bias-corrected lower $100(scp)\%$ statistical confidence limit that allegedly bounds the actual value for $s_{f(50)}$ at the $fnc^{*}$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence intervals that allegedly bound the actual value for this $s_{f(50)}$, given $s_{a}fnc$ data with actual Type I censoring and assuming a straight-line $s_{a}\log[e]fnc(pf)$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{f}$.

$PSNCLIA1$  
$SNCLDTAA$  

Computes the simulation-based pragmatic bias-corrected lower $100(scp)\%$ statistical confidence limit that allegedly bounds the actual value for $s_{f(50)}$ at the $fnc^{*}$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence intervals that allegedly bound the actual value for this $s_{f(50)}$, given $s_{a}fnc$ data with actual Type I censoring and assuming a straight-line $s_{a}\log[e]fnc(pf)$ model with a linear $s_{a}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est($csp$) based on $n_{total}$.

$PSNCLIA2$  
$SNCLDTAA$  

Prompt 6.32

Prompt 6.33

$xIV$
Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{f}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{f}(50)\), given \(s_{f}-fnc\) data with actual Type I censoring and presuming a straight-line \(s_{a}-\log_{e}(fnc(pf))\) model with a linear \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

\[PSNCLI\text{AN}\]

\[SNCLDT\text{AA}\] 8.425

Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{f}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{f}(50)\), given \(s_{f}-fnc\) data with no censoring and presuming a straight-line \(s_{a}-\log_{e}(fnc(pf))\) model with a linear \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(\(esp\)).

\[PSNCLI\text{NN}\]

\[SNCLDT\text{AN}\] 8.400

Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{f}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{f}(50)\), given \(s_{f}-fnc\) data with no censoring and presuming a straight-line \(s_{a}-\log_{e}(fnc(pf))\) model with a linear \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

\[PSNCLI\text{PI}\]

\[SNCLDT\text{AN}\] 8.399

Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{f}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{f}(50)\), given \(s_{f}-fnc\) data with potential Type I censoring and presuming a straight-line \(s_{a}-\log_{e}(fnc(pf))\) model with a linear \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(esp\)).

\[PSNCLI\text{PN}\]

\[SNCLDT\text{AP}\] 8.460

Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{f}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{f}(50)\), given \(s_{f}-fnc\) data with potential Type I censoring and presuming a straight-line \(s_{a}-\log_{e}(fnc(pf))\) model with a linear \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.
Computes the simulation-based pragmatic bias-corrected lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for \( s_f(50) \) at the \textit{fnec} value of specific interest, based on the 95\textsuperscript{th} percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( s_f(50) \), given \( s_{\alpha} \text{-fnc} \) data with actual Type I censoring and presuming a straight-line \( s_{\alpha} \text{-log}_e(\text{fnc}(pf)) \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on \( n_f \).

Computes the simulation-based pragmatic bias-corrected lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for \( s_f(50) \) at the \textit{fnec} value of specific interest, based on the 95\textsuperscript{th} percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( s_f(50) \), given \( s_{\alpha} \text{-fnc} \) data with actual Type I censoring and presuming a straight-line \( s_{\alpha} \text{-log}_e(\text{fnc}(pf)) \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on \( n_{\text{total}} \).

Computes a simulation-based pragmatic bias-corrected \( A \)-basis or \( B \)-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_f(01) \) or \( s_f(10) \) based on the 95\textsuperscript{th} percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_f(01) \) or \( s_f(10) \), given \( s_{\alpha} \text{-fnc} \) data with actual Type I censoring and presuming a straight-line \( s_{\alpha} \text{-log}_e(\text{fnc}(pf)) \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes the simulation-based pragmatic bias-corrected lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for \( s_f(50) \) at the \textit{fnec} value of specific interest, based on the 95\textsuperscript{th} percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( s_f(50) \), given \( s_{\alpha} \text{-fnc} \) data with no censoring and presuming a straight-line \( s_{\alpha} \text{-log}_e(\text{fnc}(pf)) \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(csp).

Computes the simulation-based pragmatic bias-corrected lower 100(\text{scp})\% statistical confidence limit that allegedly bounds the actual value for \( s_f(50) \) at the \textit{fnec} value of specific interest, based on the 95\textsuperscript{th} percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \( s_f(50) \), given \( s_{\alpha} \text{-fnc} \) data with no censoring and presuming a straight-line \( s_{\alpha} \text{-log}_e(\text{fnc}(pf)) \) model with a logarithmic \( s_{\alpha} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

\textit{xlvii}
Computes the simulation-based pragmatic bias-corrected lower 100(\(sep\))\% statistical confidence limit that allegedly bounds the actual value for \(s_{fp}(50)\) at the \(fnc^{*}\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{fp}(50)\), given \(s_{a}\)-\(fnc\) data with potential Type I censoring and assuming a straight-line \(s_{a}-\log_{e}[fnc(pf)]\) model with a logarithmic \(s_{a}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(csp\)).

SNCLDTAP 8.466

SNCLDTAP 8.465

SNCLDTAA 8.444

SNCLDTAA 8.445

SNCLDTAA 8.443

 xlviii
Computes the simulation-based pragmatic bias-corrected lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\delta}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\(^{th}\) (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{\delta}(50)\), given \(s_{\alpha}\) data with no censoring and presuming a parabolic \(s_{\alpha}^{-\log_\alpha[fnc(pf)]]\) model with a linear \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(\(scp\)).

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Computes the simulation-based pragmatic bias-corrected lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\delta}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\(^{th}\) (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{\delta}(50)\), given \(s_{\alpha}\) data with no censoring and presuming a parabolic \(s_{\alpha}^{-\log_\alpha[fnc(pf)]]\) model with a linear \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

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Computes the simulation-based pragmatic bias-corrected lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\delta}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\(^{th}\) (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{\delta}(50)\), given \(s_{\alpha}\) data with potential Type I censoring and presuming a parabolic \(s_{\alpha}^{-\log_\alpha[fnc(pf)]]\) model with a linear \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\)).

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Computes the simulation-based pragmatic bias-corrected lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\delta}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\(^{th}\) (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{\delta}(50)\), given \(s_{\alpha}\) data with potential Type I censoring and presuming a parabolic \(s_{\alpha}^{-\log_\alpha[fnc(pf)]]\) model with a linear \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

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Computes the simulation-based pragmatic bias-corrected lower 100(\(scp\))% statistical confidence limit that allegedly bounds the actual value for \(s_{\delta}(50)\) at the \(fnc^*\) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95\(^{th}\) (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this \(s_{\delta}(50)\), given \(s_{\alpha}\) data with actual Type I censoring and presuming a parabolic \(s_{\alpha}^{-\log_\alpha[fnc(pf)]]\) model with a logarithmic \(s_{\alpha}\) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(\(scp\)) based on \(n_f\).
Computes the simulation-based pragmatic bias-corrected lower 100(\text{sep})% statistical confidence limit that allegedly bounds the actual value for $s_{\delta}(50)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{\delta}(50)$, given $s_{\omega}$-\text{fncc} data with actual Type I censoring and presuming a parabolic $s_{\omega}-\text{log}_e[fnc(pf)]$ model with a logarithmic $s_{\omega}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \text{est}(\text{csp}) based on $n_{\text{total}}$.

Computes the simulation-based pragmatic bias-corrected lower 100(\text{sep})% statistical confidence limit that allegedly bounds the actual value for $s_{\delta}(50)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{\delta}(50)$, given $s_{\omega}$-\text{fncc} data with actual Type I censoring and presuming a parabolic $s_{\omega}-\text{log}_e[fnc(pf)]$ model with a logarithmic $s_{\omega}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes the simulation-based pragmatic bias-corrected lower 100(\text{sep})% statistical confidence limit that allegedly bounds the actual value for $s_{\delta}(50)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{\delta}(50)$, given $s_{\omega}$-\text{fncc} data with no censoring and presuming a parabolic $s_{\omega}-\text{log}_e[fnc(pf)]$ model with a logarithmic $s_{\omega}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic \text{est}(\text{csp}).

Computes the simulation-based pragmatic bias-corrected lower 100(\text{sep})% statistical confidence limit that allegedly bounds the actual value for $s_{\delta}(50)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{\delta}(50)$, given $s_{\omega}$-\text{fncc} data with no censoring and presuming a parabolic $s_{\omega}-\text{log}_e[fnc(pf)]$ model with a logarithmic $s_{\omega}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes the simulation-based pragmatic bias-corrected lower 100(\text{sep})% statistical confidence limit that allegedly bounds the actual value for $s_{\delta}(50)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{\delta}(50)$, given $s_{\omega}$-\text{fncc} data with potential Type I censoring and presuming a parabolic $s_{\omega}-\text{log}_e[fnc(pf)]$ model with a logarithmic $s_{\omega}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \text{est}(\text{csp}).
Computes the simulation-based pragmatic bias-corrected lower 100(scp)% statistical confidence limit that allegedly bounds the actual value for $s_{f}(50)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for this $s_{f}(50)$, given $s_{\alpha}^{*}-fnc$ data with potential Type I censoring and presuming a parabolic $s_{\alpha}-\log_{10}[fnc(p)]$ model with a logarthmic $s_{\alpha}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{\alpha}^{*}-fnc$ data with actual Type I censoring and presuming a straight-line $s_{\alpha}^{*}-\log_{10}[fnc(p)]$ model with a linear $s_{\alpha}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_f$.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{\alpha}^{*}-fnc$ data with actual Type I censoring and presuming a straight-line $s_{\alpha}^{*}-\log_{10}[fnc(p)]$ model with a linear $s_{\alpha}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp) based on $n_{total}$.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{\alpha}^{*}-fnc$ data with actual Type I censoring and presuming a straight-line $s_{\alpha}^{*}-\log_{10}[fnc(p)]$ model with a linear $s_{\alpha}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{\alpha}^{*}-fnc$ data with no censoring and presuming a straight-line $s_{\alpha}^{*}-\log_{10}[fnc(p)]$ model with a linear $s_{\alpha}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(csp)
Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{g}(01)$ or $s_{g}(10)$, given $s_{g,fnc}$ data with no censoring and assuming a straight-line $s_{g}^{*} = \log_{e}(fnc(pf))$ model with a linear $s_{g}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{f,fnc}$ data with potential Type I censoring and assuming a straight-line $s_{f}^{*} = \log_{e}(fnc(pf))$ model with a linear $s_{f}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{g}(01)$ or $s_{g}(10)$, given $s_{g,fnc}$ data with potential Type I censoring and assuming a straight-line $s_{g}^{*} = \log_{e}(fnc(pf))$ model with a linear $s_{g}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections.

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f}(01)$ or $s_{f}(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f}(01)$ or $s_{f}(10)$, given $s_{f,fnc}$ data with actual Type I censoring and assuming a straight-line $s_{f}^{*} = \log_{e}(fnc(pf))$ model with a logarithmic $s_{f}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$ based on $n_{f}$.

Computes a simulation-based pragmatic bias corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{g}(01)$ or $s_{g}(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{g}(01)$ or $s_{g}(10)$, given $s_{g,fnc}$ data with actual Type I censoring and assuming a straight-line $s_{g}^{*} = \log_{e}(fnc(pf))$ model with a logarithmic $s_{g}$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$ based on $n_{total}$.
Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f\delta}(01)$ or $s_{f\delta}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f\delta}(01)$ or $s_{f\delta}(10)$, given $s_{a-fnc}$ data with actual Type I censoring and presuming a straight-line $s_{a-\log_e[fnc(pf)\]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f\delta}(01)$ or $s_{f\delta}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f\delta}(01)$ or $s_{f\delta}(10)$, given $s_{a-fnc}$ data with no censoring and presuming a straight-line $s_{a-\log_e[fnc(pf)\]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic est(csp)

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f\delta}(01)$ or $s_{f\delta}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f\delta}(01)$ or $s_{f\delta}(10)$, given $s_{a-fnc}$ data with no censoring and presuming a straight-line $s_{a-\log_e[fnc(pf)\]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f\delta}(01)$ or $s_{f\delta}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f\delta}(01)$ or $s_{f\delta}(10)$, given $s_{a-fnc}$ data with potential Type I censoring and presuming a straight-line $s_{a-\log_e[fnc(pf)\]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic est(csp)

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_{f\delta}(01)$ or $s_{f\delta}(10)$ at the $fnc^*$ value of specific interest, based on the $95^{th}$ percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_{f\delta}(01)$ or $s_{f\delta}(10)$, given $s_{a-fnc}$ data with potential Type I censoring and presuming a straight-line $s_{a-\log_e[fnc(pf)\]}$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections
Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{g}(01) \) or \( s_{g}(10) \) at the \( fnc^* \) value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{g}(01) \) or \( s_{g}(10) \), given \( s_{df} fnc \) data with actual Type I censoring and assuming a parabolic \( s_{df} \log_{e}(fnc(pf)) \) model with a linear \( s_{df} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( n_{total} \)

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{g}(01) \) or \( s_{g}(10) \) at the \( fnc^* \) value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{g}(01) \) or \( s_{g}(10) \), given \( s_{df} fnc \) data with actual Type I censoring and assuming a parabolic \( s_{df} \log_{e}(fnc(pf)) \) model with a linear \( s_{df} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( n_{total} \)

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{g}(01) \) or \( s_{g}(10) \) at the \( fnc^* \) value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{g}(01) \) or \( s_{g}(10) \), given \( s_{df} fnc \) data with actual Type I censoring and assuming a straight-line \( s_{df} \log_{e}(fnc(pf)) \) model with a linear \( s_{df} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{g}(01) \) or \( s_{g}(10) \) at the \( fnc^* \) value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{g}(01) \) or \( s_{g}(10) \), given \( s_{df} fnc \) data with no censoring and assuming a parabolic \( s_{df} \log_{e}(fnc(pf)) \) model with a linear \( s_{df} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic \( est(csp) \)

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{g}(01) \) or \( s_{g}(10) \) at the \( fnc^* \) value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{g}(01) \) or \( s_{g}(10) \), given \( s_{df} fnc \) data with no censoring and assuming a parabolic \( s_{df} \log_{e}(fnc(pf)) \) model with a linear \( s_{df} \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections


Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \) at the \( fnc^* \) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \), given \( s_{\alpha-fnc} \) data with potential \( Type I \) censoring and assuming a parabolic \( s_c \log_e[fnc(pf)] \) model with a linear \( s_c \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \)

\[ SNTLDTAP \]

8.468
&
8.470

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \) at the \( fnc^* \) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \), given \( s_{\alpha-fnc} \) data with potential \( Type I \) censoring and assuming a parabolic \( s_c \log_e[fnc(pf)] \) model with a linear \( s_c \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

\[ SNTLDTAP \]

8.467
&
8.469

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \) at the \( fnc^* \) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \), given \( s_{\alpha-fnc} \) data with actual \( Type I \) censoring and assuming a parabolic \( s_c \log_e[fnc(pf)] \) model with a logarithmic \( s_c \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( nf \)

\[ SNTLDTAA \]

8.447
&
8.450

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \) at the \( fnc^* \) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \), given \( s_{\alpha-fnc} \) data with actual \( Type I \) censoring and assuming a parabolic \( s_c \log_e[fnc(pf)] \) model with a logarithmic \( s_c \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic \( est(csp) \) based on \( n_{total} \)

\[ SNTLDTAA \]

8.448
&
8.451

Computes a simulation-based pragmatic bias-corrected A-basis or B-basis statistical tolerance limit that allegedly bounds the actual value for the \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \) at the \( fnc^* \) value of specific interest, based on the 95\(^{th}\) percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95\% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for \( s_{f_0}^{(0)} \) or \( s_{f_0}^{(10)} \), given \( s_{\alpha-fnc} \) data with actual \( Type I \) censoring and assuming a parabolic \( s_c \log_e[fnc(pf)] \) model with a logarithmic \( s_c \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

\[ SNTLDTAA \]

8.446
&
8.449
Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_f(01)$ or $s_f(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_f(01)$ or $s_f(10)$, given $s_{cf}fnc$ data with no censoring and assuming a parabolic $s_a\log_e[fnc(pf)]$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with Version LS statistical bias-correction factors and the exact multiplicative median statistical bias-correction factor for generic $est(csp)$

$PSNTL4N$  

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_f(01)$ or $s_f(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_f(01)$ or $s_f(10)$, given $s_{cf}fnc$ data with no censoring and assuming a parabolic $s_a\log_e[fnc(pf)]$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

$PSNTL4NN$  

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_f(01)$ or $s_f(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_f(01)$ or $s_f(10)$, given $s_{cf}fnc$ data with potential Type 1 censoring and assuming a parabolic $s_a\log_e[fnc(pf)]$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with extrapolated Version LS statistical bias-correction factors and an extrapolated exact multiplicative median statistical bias-correction factor for generic $est(csp)$

$PSNTL4P1$  

Computes a simulation-based pragmatic bias-corrected $A$-basis or $B$-basis statistical tolerance limit that allegedly bounds the actual value for the $s_f(01)$ or $s_f(10)$ at the $fnc^*$ value of specific interest, based on the 95th percentile of the pragmatic sampling distribution that is comprised of up to 30000 Method Two lower 95% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for $s_f(01)$ or $s_f(10)$, given $s_{cf}fnc$ data with potential Type 1 censoring and assuming a parabolic $s_a\log_e[fnc(pf)]$ model with a logarithmic $s_a$ metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML analysis with no statistical bias corrections

$PSNTL4PN$  

Computes the probability $p$ that corresponds to the numerical value for Student’s central $t$ test statistic of specific interest

$PT$  

Computes the probability $p$ that corresponds to the numerical value for the standardized conceptual normal distribution variate $y$ of specific interest

$PY$  

Performs a ML analysis for a conceptual quadratic normally distributed $isv$-$sdv$ model with a heteroscedastic standard deviation $csp = csp0 + csp1 \cdot isv$

$QMNDHESD$  

Performs a ML analysis for a conceptual quadratic normally distributed $isv$-$sdv$ model with a homoscedastic standard deviation $csp$

$QMNDHOSD$  

Performs a ML analysis for a conceptual quadratic normally distributed $isv$-$sdv$ model with a revised heteroscedastic standard deviation $csp = csp1 \cdot isv$

$QMWRHESD$  

Generates equally-likely pseudorandom integers - version 1

$RANDOM1$  

$iVi$
RANDOM? Generates equally-likely pseudorandom integers - version 2

RBBHT Performs a randomization-based version of Bartlett's likelihood-ratio test for homoscedasticity, given either (i) the respective datum values from a CRD experiment test program or (ii) the respective non-repeated \( \text{est(CRHNDEE)} \) 's from unreplicated RCB or SPD experiment test programs

RBBVACRD Performs a randomization-based test of the null hypothesis that \( B = A \) statistically versus the simple (one-sided) alternative hypothesis that \( B > A \) statistically, given a and b datum values generated by conducting a CRD experiment test program

RBBVAMPD Performs a randomization-based test of the null hypothesis that \( (B-mpd) = A \) statistically versus the simple (one-sided) alternative hypothesis that \( (B-mpd) > A \) statistically, given a and b datum values generated by conducting a CRD experiment test program, for any value of the minimum practical difference \( mpd \) of specific interest

RBKTAU Performs a randomization-based version of Kendall's \( \tau \) test for independence (viz., for the lack of a monotonic association) given a collection of paired datum values, where one set of datum values can be arbitrary, e.g., the time-order-of-testing

RRCB2143 Performs a randomization-based version of fixed-effects ANOVA for an unreplicated RCB experiment test program with a \( (2)^2 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \( c12esc \) is equal to zero and presuming that the actual value for the \( c112ie \) is equal to zero

RRCB3412 Performs a randomization-based version of fixed-effects ANOVA for an unreplicated RCB experiment test program with a \( (2)^2 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \( c12esc \) is equal to zero and presuming that the actual value for the \( c112ie \) is equal to zero

RRCBDonH Performs a randomization-based version of fixed-effects ANOVA for an unreplicated RCBD experiment test program, given the omnibus null hypothesis that the actual values for all of the \( cte\)sc's are equal to zero

RSPD2143 Performs a randomization-based version of fixed-effects ANOVA for an unreplicated split-plot experiment test program with a \( (2)^2 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \( cuptesc \) is equal to zero and presuming that the actual value for the \( cmpstsptic \) is equal to zero

RSPD3412 Performs a randomization-based version of fixed-effects ANOVA for an unreplicated split-plot experiment test program with a \( (2)^2 \) factorial arrangement for its four treatment combinations, given the specific null hypothesis that the actual value for the \( cuptesc \) is equal to zero and presuming that the actual value for the \( cmpstsptie \) is equal to zero

SAFNCM1N Computes lower 100(scp)% (one-sided) statistical confidence limits and tolerance limits using Student's central \( t \) and Student's non-central \( t \) given \( s_a\) - \( \text{fnf} \) datum values with no censoring and presuming a straight-line \( s_a - \log_2[\text{fnf}(pf)] \) model with a linear \( s_a \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML with Version LS statistical bias-correction factors

SAFNCM2N Computes lower 100(scp)% (one-sided) statistical confidence limits and tolerance limits using Student's central \( t \) and Student's non-central \( t \) given \( s_a\) - \( \text{fnf} \) datum values with no censoring and presuming a straight-line \( s_a - \log_2[\text{fnf}(pf)] \) model with a logarithmic \( s_a \) metric and a homoscedastic conceptual (two-parameter) normal fatigue strength distribution in a conditional ML with Version LS statistical bias-correction factors

SAFNCMDTA (8.35)

SAFNCMDTA (8.35)
Computes lower 100(scp)% (one-sided) statistical confidence limits and 
tolerance limits using Student's central t and Student's non-central t given 
s_{a-fnc} data values with no censoring and presuming a parabolic 
s_{a-log_{e}[fnc(pf)]]} model with a linear s_{a} metric and a homosedastic conceptual 
(two-parameter) normal fatigue strength distribution in a conditional ML with 
Version LS statistical bias-correction factors

SEFNCM3N

SAFNCDTA 8.36

Computes lower 100(scp)% (one-sided) statistical confidence limits and 
tolerance limits using Student's central t and Student's non-central t given 
s_{a-fnc} data values with no censoring and presuming a parabolic 
s_{a-log_{e}[fnc(pf)]]} model with a logarithmic s_{a} metric and a homosedastic conceptual 
(two-parameter) normal fatigue strength distribution in a conditional ML with Version LS statistical bias-correction factors

SAFNCDTA (8.35)

Generates 50 new sets of three, three-digit odd seed numbers for subsequent use 
in the Wichmann-Hill pseudorandom uniform number generator

SEED

(START) 1.4

Generates pseudorandom datum values from a conceptual (two-parameter) 
smallest-extreme-value distribution given numerical values for its mean and 
standard deviation

SEV

Prompt (5.17)

Performs a maximum likelihood analysis presuming a conceptual 
"one-parameter" smallest-extreme-value strength (resistance) distribution and 
computes the Method Two and LR-based lower 100(scp)% (one-sided) 
asymptotic statistical confidence limits that allegedly bound the actual value for 
s(50)

SEV1A

UADDATA 8.38

Performs a maximum likelihood analysis given a conceptual 
(two-parameter) smallest-extreme-value strength (resistance) distribution and 
computes the Method One and Method Two lower 100(scp)% (one-sided) 
asymptotic statistical confidence limit that allegedly bounds the actual value for 
s(pf)

SEV2ALCL

(ASDDATA) 8.289

Performs a maximum likelihood analysis given a conceptual (two-parameter) 
smallest-extreme-value strength (resistance) distribution and computes the Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limit that allegedly bounds the actual value for s(50) using Student's central t

SEV2AS50

(ASDDATA) 8.287

Performs a maximum likelihood analysis given a conceptual (two-parameter) 
smallest-extreme-value strength (resistance) distribution and computes two alternative numerical lower 100(scp)% (one-sided) asymptotic statistical confidence bands that allegedly bound the actual CDF

SEV2B

(ASDDATA) 8.515

Performs a maximum likelihood analysis given a conceptual 
(two-parameter) smallest-extreme-value strength (resistance) distribution and 
computes two alternative numerical lower 100(scp)% (one-sided) asymptotic 
statistical confidence limits that allegedly bound the actual value for s(pf)

SEV2C

(ASDDATA) 8.522

Generates pseudorandom data from a conceptual (two-parameter) normal 
distribution (see Figures 5.4 and 5.5)

SIMNOR

Prompt 5.12

Simulates the variability of A-basis statistical tolerance limits for datum values 
with no censoring that are presumed to have been randomly selected from a 
conceptual two parameter log_{e}-normal life (endurance) distribution.

SLNABTLN

(SSTLDTAN) (8.55)

Simulates the variability of B-basis statistical tolerance limits for datum values 
with no censoring that are presumed to have been randomly selected from a 
conceptual two parameter log_{e}-normal life (endurance) distribution.

SLNBBTLN

(SSTLDTAN) (8.55)

Simulates the variability of A-basis statistical tolerance limits for datum values 
with no censoring that are presumed to have been randomly selected from a 
conceptual (two-parameter) normal distribution.

SNABSTLN

(SSTLDTAN) (8.54)
Simulates the variability of $B$-basis statistical tolerance limits for datum values with no censoring that are presumed to have been randomly selected from a conceptual (two-parameter) normal distribution.

Computes the ML estimate of the actual value for the median endurance limit, $s_{el}(50)$, given $s_d-fnc$ data with one or more run-outs and employing the median bias-corrected conditional ML estimate of the actual value for the homoscedastic $csp$ in a two-segment straight-line $s_d-[fnc(pf)]$ model with identical normally distributed fatigue strength and endurance limit distributions.

Computes a lower $100(scp)\%$ (one-sided) statistical confidence limit that allegedly bounds the actual value for $s_{el}(50)$ at est($fnc_knee$), given $s_d-fnc$ data with one or more run-outs and employing Student's central $t$ and the median bias-corrected conditional ML estimate of the actual value for the homoscedastic $csp$ in a two-segment straight-line $s_d-[fnc(pf)]$ model with identical normally distributed fatigue strength and endurance limit distributions.

Simulates the proportion of $100(scp)\%$ lower (one-sided) statistical confidence limit assertions that are actually correct as a quantitative CRD experiment test program is replicated 1000 times.

Computes a lower $100(scp)\%$ (one-sided) statistical confidence limit that allegedly bounds the actual value for $s_{el}(50)$ at est($fnc_knee$), given $s_d-fnc$ data with one or more run-outs and employing Student's central $t$ and the median bias-corrected conditional ML estimate of the actual value for the homoscedastic $csp$ in a two-segment straight-line $s_d-[fnc(pf)]$ model with identical loge-normally distributed fatigue strength and endurance limit distributions.
Generates the simulation-based sampling distribution for the statistic [the half-width of the classical (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the mean of a conceptual (two-parameter) normal distribution]

Computes 12 simulation-based “replicate” classical (shortest) 100(\(scp\))% (two-sided) statistical confidence intervals that allegedly (individually) include the actual value for the mean of a conceptual (two-parameter) normal distribution using the exact mean statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the ratio of the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the mean of a conceptual (two-parameter) normal distribution to its associated mid-point] using the exact mean statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the mean of a conceptual (two-parameter) normal distribution using the exact median statistical bias-correction factor for generic \(est(csp)\)]

Computes 12 simulation-based “replicate” classical (shortest) 100(\(scp\))% (two-sided) statistical confidence intervals that allegedly (individually) include the actual value for the mean of a conceptual (two-parameter) normal distribution using the exact median statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the ratio of the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the mean of a conceptual (two-parameter) normal distribution to its associated mid-point using the exact median statistical bias-correction factor for generic \(est(csp)\)]

Generates the simulation-based sampling distribution for the statistic [the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the mean of a conceptual (two-parameter) normal distribution] using the exact median statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the \(clp0\) in simple linear regression], using the exact median statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes the actual value of the \(clp1\) in simple linear regression], using the exact median statistical bias-correction factor for generic \(est(csp)\)

Generates the simulation-based sampling distribution for the statistic [the half-width of the pragmatic (shortest) 100(\(scp\))% (two-sided) statistical confidence interval that allegedly includes \(\text{mean}(APRCRHNDRDV)'s\) given \(ivv = ivv^*\) in simple linear regression], using the exact median statistical bias-correction factor for generic \(est(csp)\)

Simulates the variability of the Thoman, Bain and Antle ML-based \(A\)-basis statistical tolerance limits given replicate datum values with no censoring that are randomly selected from a conceptual two parameter Weibull life (endurance) distribution.

\(\text{Estimated Value}\)
**SWABTL2N**
Simulates the variability of the Mann and Fertig BLI-based A-basis statistical tolerance limits given replicate datum values with no censoring that are randomly selected from a conceptual two parameter Weibull life (endurance) distribution.

(SSTLDTAN) (8.57)

**SWBBTL1N**
Simulates the variability of the Thoman, Bain and Antle ML-based B-basis statistical tolerance limits given replicate datum values with no censoring that are randomly selected from a conceptual two parameter Weibull life (endurance) distribution.

(WBB1NDTA) (8.57)

**SWBBTL2N**
Simulates the variability of the Mann and Fertig BLI-based B-basis statistical tolerance limits given replicate datum values with no censoring that are randomly selected from a conceptual two parameter Weibull life (endurance) distribution.

(SSTLDTAN) (8.57)

**TP**
Computes the numerical value for Student's central t test statistic metric that corresponds to the probability p value of specific interest

Prompt (5.23)

**TSSNM150**
Computes the conditional ML estimate of the actual value for \(s_\alpha(50)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical normally distributed fatigue strength and endurance limit distributions

(SN50DWRO) 8.234

**TSSNM1CL**
Computes an analogous lower 100(\(scp\))\% (one-sided) statistical confidence limit that allegedly bounds the actual value for the \(s_\alpha(50)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical normally distributed fatigue strength and endurance limit distributions

(SNCLDWRO) 8.235

**TSSNM1TL**
Computes analogous A-basis and B-basis statistical tolerance limits that allegedly bound the actual value for \(s_\alpha(10)\) and \(s_\alpha(01)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical normally distributed fatigue strength and endurance limit distributions

(SNTLDWRO) 8.236

**TSSNM250**
Computes the conditional ML estimate of the actual value \(s_\alpha(50)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical log\(_e\)-normally distributed fatigue strength and endurance limit distributions

(SN50DWRO) 8.238

**TSSNM2CL**
Computes an analogous lower 100(\(scp\))\% (one-sided) statistical confidence limit that allegedly bounds the actual value for the \(s_\alpha(50)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical log\(_e\)-normally distributed fatigue strength and endurance limit distributions

(SNCLDWRO) 8.239

**TSSNM2TL**
Computes analogous A-basis and B-basis statistical tolerance limits that allegedly bound the actual value for \(s_\alpha(10)\) and \(s_\alpha(01)\) at \(\text{fnc}\)\(^*\), given \(s_\alpha\text{-fnc}\) data with one or more run-outs and a two-segment straight-line \(s_\alpha\text{-fnc(pf)}\) model with identical log\(_e\)-normally distributed fatigue strength and endurance limit distributions

(SNTLDWRO) 8.240

**UNI**
Generates pseudorandom datum values from a conceptual (two-parameter) uniform distribution given numerical values for its mean and standard deviation

Prompt (5.17)

**UNIFORM**
Generates pseudorandom numbers that are uniformly distributed over the interval from zero to one

Prompt 3.13

**UWLOSSCB**
Computes a parallel uniform width lower 100(\(scp\))\% (one-sided) statistical confidence band in simple linear regression that allegedly bounds the actual value for \([\text{mean}(\text{APRCRHNDV})\text{'s given }\text{iiv}\ast\text{'] for all }\text{iiv}\ast\text{'}\text{'s in the interval from }\text{iiv}\text{low to }\text{iiv}\text{high}\)

(UWLCBDTA) 7.27
Computes a parallel uniform width lower 100(scp)% (one-sided) statistical tolerance band in simple linear regression that allegedly bounds at least (p)% of \([APRCSRHDVV]'s given \textit{inv}^* \) for all \(\textit{inv}^*\)'s in the interval from \(\textit{inv}_{\text{low}}\) to \(\textit{inv}_{\text{high}}\)

\(UWLOSSTB\)

7.27

Computes conditional ML-based parallel uniform width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \(s_{e}(50)\) and \(s_{e}(50)\), given \(s_{\alpha}[-\text{fnc}(p)]\) model with identical normal fatigue strength and endurance limit distributions

\(UWSNM1CB\)

8.242

Computes analogous parallel uniform width \(A\)-basis and \(B\)-basis statistical tolerance bands that allegedly bound the actual values for \(s_{e}(10)\) and \(s_{e}(01)\) [and for \(s_{e}(10)\) and \(s_{e}(01)\)], given \(s_{\alpha}[-\text{fnc}(p)]\) model with one or more run-outs and a two-segment straight-line \(s_{\alpha}[-\text{fnc}(p)]\) model with identical normal fatigue strength and endurance limit distributions

\(UWSNM1TB\)

8.243

\&

8.244

Computes conditional ML-based parallel uniform width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \(s_{e}(50)\) and \(s_{e}(50)\), given \(s_{\alpha}[-\text{fnc}(p)]\) model with one or more run-outs and a two-segment straight-line \(s_{\alpha}[-\text{fnc}(p)]\) model with identical \(\log_{e}\)-normal fatigue strength and endurance limit distributions

\(UWSNM2CB\)

8.245

\(UWSNM2TB\)

8.246

\&

8.247

Computes parallel uniform width \(A\)-basis and \(B\)-basis statistical tolerance bands that allegedly bound the actual values for \(s_{e}(10)\) and \(s_{e}(01)\) [and for \(s_{e}(10)\) and \(s_{e}(01)\)], given \(s_{\alpha}[-\text{fnc}(p)]\) model with one or more run-outs and a two-segment straight-line \(s_{\alpha}[-\text{fnc}(p)]\) model with identical \(\log_{e}\)-normal fatigue strength and endurance limit distributions

\(UWSNM4CB\)

8.273

\(UWSNM4TB\)

8.274

\&

8.275

Computes parallel uniform width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \(s_{e}(50)\), given \(s_{\alpha}[-\text{fnc}(p)]\) model with a normal fatigue strength distribution

\(UWSNMACB\)

8.276

\(UWSNMA TB\)

8.277

\&

8.278

Computes parallel uniform width \(A\)-basis and \(B\)-basis statistical tolerance bands that allegedly bound the actual values for \(s_{e}(10)\) and \(s_{e}(01)\) [and for \(s_{e}(10)\) and \(s_{e}(01)\)], given \(s_{\alpha}[-\text{fnc}(p)]\) model with a \(\log_{e}\)-normal fatigue strength distribution

\(UWSNMBCB\)

8.279

\(UWSNMBTB\)

8.280

\&

8.281

Computes analogous variable width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \(s_{e}(50)\) and \(s_{e}(50)\), given \(s_{\alpha}[-\text{fnc}(p)]\) model with identical normal fatigue strength and endurance limit distributions

\(VWSNM1CB\)

8.248

\&

8.249

Computes analogous variable width \(A\)-basis and \(B\)-basis statistical tolerance bands that allegedly bound the actual values for \(s_{e}(10)\) and \(s_{e}(01)\) [and for \(s_{e}(10)\) and \(s_{e}(01)\)], given \(s_{\alpha}[-\text{fnc}(p)]\) model with identical normal fatigue strength and endurance limit distributions

\(VWSNM1TB\)

8.250

\&

8.251

8.252

8.253
Computes analogous variable width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \( s_{f_0}(50) \) and \( s_{f_0}(50) \), given \( s_{a-fnc} \) data with one or more run-outs and a two-segment straight-line \( s_{a-fnc}(pf) \) model with identical log\(_e\)-normal fatigue strength and endurance limit distributions

Computes analogous variable width \( A \)-basis and \( B \)-basis statistical tolerance bands that allegedly bound the actual values for \( s_{f_0}(10) \) and \( s_{f_0}(01) \) [and for \( s_{f_0}(10) \) and \( s_{f_0}(01) \)], given \( s_{a-fnc} \) data with one or more run-outs and a two-segment straight-line \( s_{a-fnc}(pf) \) model with identical log\(_e\)-normal fatigue strength and endurance limit distributions

Computes analogous variable width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \( s_{f_0}(50) \), given \( s_{a-fnc} \) data with no censoring and a one-segment straight-line \( s_{a-fnc}(pf) \) model with a normal fatigue strength distribution

Computes analogous variable width \( A \)-basis and \( B \)-basis statistical tolerance bands that allegedly bound the actual values for \( s_{f_0}(10) \) and \( s_{f_0}(01) \), given \( s_{a-fnc} \) data with no censoring a one-segment straight-line \( s_{a-fnc}(pf) \) model with a normal fatigue strength distribution

Computes analogous variable width lower 100(scp)% (one-sided) statistical confidence bands that allegedly bounds the actual values for \( s_{f_0}(50) \), given \( s_{a-fnc} \) data with no censoring and a one-segment straight-line \( s_{a-fnc}(pf) \) model with a log\(_e\)-normal fatigue strength distribution

Computes analogous variable width \( A \)-basis and \( B \)-basis statistical tolerance bands that allegedly bound the actual values for \( s_{f_0}(10) \) and \( s_{f_0}(01) \), given \( s_{a-fnc} \) data with no censoring a one-segment straight-line \( s_{a-fnc}(pf) \) model with a log\(_e\)-normal fatigue strength distribution

Generates pseudorandom datum values from a conceptual two-parameter Weibull distribution given numerical values for its mean and standard deviation

Computes the values for the \( cdpl \) and the \( cdp2 \) given a conceptual two-parameter Weibull distribution with known median and standard deviation

Performs a maximum likelihood analysis with no statistical bias corrections, given arbitrarily suspended tests and presuming a conceptual two-parameter Weibull life (endurance) distribution, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) value of specific interest

Computes the values for the \( cdpl \) and the \( cdp2 \) given a conceptual two-parameter Weibull distribution with known mean and standard deviation

Performs a maximum likelihood analysis with no statistical bias corrections, given actual Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) value of specific interest

Performs a maximum likelihood analysis with no statistical bias corrections, given no censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution, and computes the Method One and Method Two lower 100(scp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( fnc(pf) \) value of specific interest
| WEIBULLP | Performs a maximum likelihood analysis with no statistical bias corrections, given potential Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution and computes the Method One and Method Two lower 100(1 - cp)% (one-sided) asymptotic statistical confidence limits that allegedly bound the actual value for the \( f_{nc}(p) \) value of specific interest |
| WMLCYACI | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML-based coefficient of variation, given actual Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with iteratively updated statistical bias corrections |
| WMLCYACN | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML-based coefficient of variation, given actual Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with no statistical bias corrections |
| WMLCVNCC | Computes simulation-based empirical multiplicative mean and median statistical bias-correction factors for the ML-based coefficient of variation, given no censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with no statistical bias corrections |
| WMLCYPIC | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML-based coefficient of variation, given potential Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with iteratively updated statistical bias corrections |
| WMLCYPICN | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML-based coefficient of variation, given potential Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with no statistical bias corrections |
| WMLEBCNN | Computes simulation-based empirical multiplicative mean and median statistical bias-correction factors for the ML est(\(cdp\)'s), given no censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with no statistical bias corrections |
| WMLPBCA! | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML est(\(cdp\)'s), given no censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with iteratively updated statistical bias corrections |
| WMLPBCAN | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML est(\(cdp\)'s), given no censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with no statistical bias corrections |
| WMLPBCP! | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML est(\(cdp\)'s), given potential Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution in ML analysis with iteratively updated statistical bias corrections |
| WMLPBCPN | Computes simulation-based pragmatic multiplicative mean and median statistical bias-correction factors for the ML est(\(cdp\)'s), given potential Type I censoring and presuming a conceptual two-parameter Weibull life (endurance) distribution with no statistical bias corrections |
| WMLRFRTR | Computes the Thoman, Bain, and Antle simulation-based reliability factor required to run microcomputer programs \(SWABTLIN\) and \(SWBBTLIN\) |
Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with “empirical” multiplicative statistical bias-correction factors obtained by iteratively running microcomputer program WMLEBCAI

Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given actual Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with no statistical bias corrections

Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with empirical multiplicative statistical bias-correction factors obtained by running microcomputer program WMLEBCNN

Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given no censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with no statistical bias corrections

Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with “empirical” multiplicative statistical bias-correction factors obtained by iteratively running microcomputer program WMLEBCPI

Computes the Thoman, Bain, and Antle simulation-based lower 100 (scp)% statistical tolerance limit that allegedly bounds the actual value for \( fnc(pf) \), given potential Type I censoring and datum values that are presumed to have been randomly selected from a conceptual two-parameter Weibull life (endurance) distribution, in a ML analysis with no statistical bias corrections

Computes the numerical value for the standardized conceptual normal distribution variate \( y \) that corresponds to the probability \( p \) value of specific interest

Prompt

(a) Parenthesis indicates that the required microcomputer example input data file is not printed in the text.
(b) Parenthesis indicates that the associated microcomputer program example output file is not printed in the text.
NOMENCLATURE & ACRONYMS

anc  aggregated number of cycles (includes both fnc and snc datum values in a life experiment test program

ANOVA  (Statistical) Analysis of Variance (See Chapter Six)

APRCRHNDNDV’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Datum Values (pertains only to the block and the treatment or treatment combination of specific interest)

APRCRHNDRDV’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Regression Datum Values (pertains only to the ivv of specific interest)

APRCRHNDSDDV’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Stopping Distance Datum Values (pertains only to the isv of specific interest)

APRCRHNDEE’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Experimental Errors (pertains to all blocks and all treatments or treatment combinations)

APRCRHNDREE’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Regression Experimental Errors (pertains to all ivv’s)

APRCRHNDZIRDV’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Zero-Intercept Regression Datum Values (pertains only to the ivv of specific interest)

APRCRHNDZIREE’s  All Possible Replicate Conceptual Random Homoscedastic Normally Distributed Zero-Intercept Regression Experimental Errors (pertains to all ivv’s)

APRCRSIDV’s  All Possible Replicate Conceptual Random Statistically Identical Datum Values (randomly selected from the same conceptual statistical distribution)

APRCRSIEE’s  All Possible Replicate Conceptual Random Statistically Identical Experimental Errors (the corresponding experimental errors)

c  a constant, or a generic coefficient

conceptual (as in cte and cbe) — explicitly connotes theoretical as opposed to real

c  contrast (as in ctec and cbec)

cbe  conceptual block effect

concepcional block effect contrast

cbesc  conceptual block effect scalar coefficient

cbmptie  conceptual block, main-plot treatment interaction effect
cbmptiec  conceptual block, main-plot treatment interaction effect contrast

cbmptiesc  conceptual block, main-plot treatment interaction effect scalar coefficient

cbmptsptie  conceptual block, main-plot treatment, split-plot treatment interaction effect

cbmptsptiec  conceptual block, main-plot treatment, split-plot treatment interaction effect contrast

cbmptsptiesc  conceptual block, main-plot treatment, split-plot treatment interaction effect scalar coefficient

cbsptie  conceptual block, split-plot treatment interaction effect

cbsptiec  conceptual block, split-plot treatment interaction effect contrast

cbsptiesc  conceptual block, split-plot treatment interaction effect scalar coefficient

cbtie  conceptual block, treatment interaction effect

cbtiec  conceptual block, treatment interaction effect contrast

cbtiesc  conceptual block, treatment interaction effect scalar coefficient

ccc  conceptual correlation coefficient

CDF  cumulative distribution function, typically denoted \( F(\cdot) \)

cdpj  conceptual distribution parameter for a two-parameter CDF whose probability paper is constructed using a logarithmic abscissa metric, \( j = 1,2 \)

clp  conceptual location parameter for a (two-parameter) CDF whose probability paper is constructed using a linear abscissa metric

clp0  conceptual location parameter pertaining to a CDF with more than conceptual two parameters (or see below)

clp0  conceptual location parameter pertaining to \((iv)^0\) in simple linear regression

clp1  conceptual location parameter pertaining to \((iv)^1\) in simple linear regression

clpj  conceptual location parameter pertaining to \((iiv)s)^1\) in multiple linear regression (or see below)

clpj  conceptual location parameter pertaining to \((iiv)s)/i\) in multiple linear polynomial regression

clpj/k  conceptual location parameter pertaining to \((iivs)/k\) in multiple linear polynomial regression

cm  conceptual mean (of a collection of \(ctKm's\))

clmpl  fictitious conceptual minimum life parameter for a three-parameter distribution

cmpte  conceptual main-plot treatment effect

cmptec  conceptual main-plot treatment effect contrast

cmptesc  conceptual main-plot treatment effect scalar coefficient

cmptm  conceptual main-plot treatment mean

cmptspptie  conceptual main-plot treatment, split-plot treatment interaction effect

lxviii
cmptsp tiec  conceptual main-plot treatment, split-plot treatment interaction effect contrast  
cmptsp tieesc  conceptual main-plot treatment, split-plot treatment interaction effect scalar coefficient  
covar  covariance (of paired random variables or statistics)  
cp  conceptual parameter (viz., a parameter in a conceptual statistical model)  
CRD  Completely Randomized Design experiment test program  
CRDV's  Conceptual Random Datum Values  
CRHDDV's  Conceptual Random Homoscedastic Datum Values  
CRHNDDV's  Conceptual Random Homoscedastic Normally Distributed Datum Values  
CRHEE's  Conceptual Random Homoscedastic Experimental Errors  
CRHNDEE's  Conceptual Random Homoscedastic Normally Distributed Experimental Errors  
CRHNNDMPTEE's  Conceptual Random Homoscedastic Normally Distributed Main-Plot Treatment Effect Experimental Errors  
CRHNNDMPSTPIEEE's  Conceptual Random Homoscedastic Normally Distributed Main-Plot Treatment, Split-Plot Treatment Interaction Effect Experimental Errors  
CRHNNDREE's  Conceptual Random Homoscedastic Normally Distributed Regression Experimental Errors, viz., the deviations of the respective CRHNDRDV's from their associated [mean(APRCRDNDRDV's)]'s established by the conceptual simple linear regression statistical model  
CRHNDSDDV's  Conceptual Random Homoscedastic Normally Distributed Stopping Distance Datum Values (Supplemental Topic 8.F)  
CRHNDSDEE's  Conceptual Random Homoscedastic Normally Distributed Stopping Distance Experimental Errors (Supplemental Topic 8.F)  
CRHNDSPTEE's  Conceptual Random Homoscedastic Normally Distributed Split-Plot Treatment Effect Experimental Errors  
CRHNDSPlotEE's  Conceptual Random Homoscedastic Normally Distributed Sub-Plot Experimental Errors, viz., the CRHNDEE's formed by aggregating the CRHNDSPTEE's and CHNDMPTSPTIIEE's in an unreplicated split-plot experiment test program  
CRSIDV's  Conceptual Random Statistically Identical Datum Values  
CRSIEE's  Conceptual Random Statistically Identical Experimental Errors  
CSD  Conceptual Stopping Distance (a random variable)  
csdm  conceptual statistical distribution mean, viz., the actual value for the mean of the conceptual statistical distribution that is comprised of APRCRDV's in a quantitative (CRD) experiment test program
csmm conceptual statistical model mean, viz, the actual value for the mean of the conceptual statistical distribution that is comprised of APRCRDV's in a comparative experiment test program

csmmse conceptual statistical model mean scalar coefficient

csp conceptual scale parameter for a (two-parameter) CDF whose probability paper is constructed using a linear abscissa metric

cspj generic conceptual scale pertaining to a CDF with more than one scale parameter, j = 0,1,2,...

cspste conceptual split-plot treatment effect

cspstec conceptual split-plot treatment effect contrast

cspstesc conceptual split-plot treatment effect scalar coefficient

cspstm conceptual split-plot treatment mean

cme conceptual treatment effect

cotec conceptual treatment effect contrast

cotec conceptual treatment effect scalar coefficient

ctm conceptual treatment mean

cKtM technically verbalized as the actual value for the mean of the conceptual sampling distribution comprised of APRCRHND(Treatment K)DV's

d parametric duration to failure

d* a specific value for duration to failure

di duration interval (used in simulation-based microcomputer programs to estimate sub-system reliability)

disv's different initial speed values (see isv)

divv's different independent variable values (see ivv)
e parametric endurance

e* a specific value for endurance

ebm elastic modulus (Supplemental Topic 7.D)
est(-) technically verbalized as the estimate of the actual value for the (-)
est[mean(-)] technically verbalized as the estimate of the actual value for the mean of the conceptual statistical or sampling distribution that consists of all possible replicate realization values for random variable or statistic (-)
est{mean[APR(-)DV's]} technically verbalized as the estimate of the actual value for the mean of the conceptual statistical distribution that consists of APR(-)DV's (pertains to the block and the treatment or treatment combination, or to the ivv of specific interest)
est[\text{var}(-)] 

Technically verbalized as the estimate of the actual value for the variance of the conceptual statistical or sampling distribution that consists of all possible replicate realization values for the random variable or statistic (-)

est\{\text{var}[APR(-)EE's]\} 

Technically verbalized as the estimate of the actual value for the variance of the conceptual statistical distribution that consists of APR(-)EE's (pertains to all blocks and all treatments or treatment combinations, or to all ivv's of specific interest)

f(-) 

Generic probability density function (PDF), technically written as \(f(-|\text{cdp's})\) in which \(\text{cdp's}\) is verbalized as given numerical values for the respective cdp's

F (-) 

Generic cumulative distribution function (CDF), technically written as \(F(-|\text{cdp's})\) in which \(\text{cdp's}\) is verbalized as given numerical values for the respective cdp's

\(f_a\) 

Alternating force amplitude

\(fnc\) 

Parametric number of fatigue cycles

\(fnc^*\) 

A specific number of fatigue cycles

\(fnc(pf)\) 

Number of fatigue cycles pertaining to a parametric value for the probability of failure

\(fnc(pf^*)\) 

Number of fatigue cycles to the probability of failure of specific interest, where \(pf\) is stated in per cent, e.g., \(fnc(50)\) is the median number of fatigue cycles to failure

\(g\) 

Generic function (functional relationship)

\(h\) 

Generic function (functional relationship)

\(H_a\) 

Alternative hypothesis

\(H_n\) 

Null hypothesis

\(HRF\) 

Hazard rate function (also called the instantaneous failure rate function IFRF)

\(i\) 

Generic index

\(IFRF\) 

Instantaneous failure rate function (also called the hazard rate function HRF)

\(isv\) 

Initial speed value (the independent variable in a stopping distance experiment test program, Supplemental Topic 8.F))

\(ivv\) 

(Parametric) independent variable value, the abscissa metric in a linear regression experiment test program

\(ivv^*\) 

A specific value for the independent variable in simple linear regression

\(ivv_i\) 

The \(i^{th}\) ivv used in conducting the given linear regression experiment test program

\(ivv_{k,kr}\) 

The \(kr^{th}\) replicate ivv at the \(r^{th}\) divv employed in conducting the linear regression experiment test program

\(j\) 

Generic index

\(k\) 

Generic index
kps
Kendall’s positive score test statistic value

kr
index for \( n_{rkdivy} \) in linear regression, viz., the number of replicate tests conducted at the \( k^{th} \) different independent variable value, \( divy \)

ktau
Kendall’s \( \tau \) test statistic value

l
parametric life

l^*
a specific value for life

lsd
least significant difference (the test statistic in Fisher’s protected \( t \) test)

m
generic index

mpd
minimum practical difference

mean(-)
technically verbalized as the actual value for the mean of the conceptual statistical or sampling distribution that consists of all possible realization values for the random variable or statistic (-)

mean[APR(-)DV's]
technically verbalized as the actual value for the mean of the conceptual statistical distribution that consists of \( APR(-)DV's \) (pertains to the block and the treatment or treatment combination, or to the \( ivv \) of specific interest)

mpr
minimum practical ratio

(MS)
Mean Square = \((SS)/n_{sdf}\), where \( n_{sdf} \) is the number of statistical degrees of freedom pertaining to the associated sum(s) of squares (SS)

n
generic index

n_a
number of independent observations (datum values) averaged

n_b
number of blocks in an experiment test program

n_{bi}
number of binomial trials

n_{cdp}
total number of conceptual (statistical) distribution parameters

n_{clp}
total number of conceptual location parameters in a statistical model

n_{cp}
total number of conceptual parameters in a statistical model

n_{deco}
total number of distinct equally-likely outcomes

n_{digit}
total number of digits (in each pseudorandom integer number)

n_{divy}
total number of different independent variable values in simple linear regression

n_{dsdf}
total number of denominator statistical degrees of freedom for Snedecor’s central \( F \) conceptual sampling distribution and associated test statistic

n_{dv}
total number of datum values

n_{dyvy}
total number of different discrete \( y \) values that random variable \( Y \) can take on

n_f
number of flips

n_{fo}
total number of favorable outcomes

n_h
number of heads

lxxii
$n_{if}$
number of items that failed prior to enduring test duration $d^*$ in $n_{st}$ independent strength tests

$n_{is}$
number of items that survived in $n_{ri}$ independent reliability tests

$n_{it}$
number of items tested

$n_l$
number of (treatment) levels

$n_{lt}$
number of life tests in a given life (reliable life) experiment test program

$n_{mpt}$
number of main-plot treatments

$n_{nsdf}$
number of numerator statistical degrees of freedom for Snedecor's central F conceptual sampling distribution and associated test statistic

$n_{oosi}$
number of outcomes of specific interest

$n_{pc}$
number of paired-comparisons

$n_{pdv}$
number of paired datum values

$n_{ps}$
number of positive signs

$n_r$
number of replicates (replicate datum values, replicate measurement values)

$n_{rbelo}$
number of randomization-based equally-likely experiment test program outcomes

$n_{rdv}$
number of regression datum values in a regression experiment test program

$n_{rdvv}$
number of replicates at the $k^{th}$ different independent variable value $divv$ in simple linear regression, where $k$ is the index for the $divv$ and $kr$ is the index for the $n_{rdvv}$

$n_{rmv}$
number of replicate measurement values

$n_{rprv}$
number of replicate paired realization values (datum values, measurement values)

$n_{rt}$
number of independent reliability tests conducted in a reliability experiment test program

$n_{rvos}$
number of random variables or statistics

$n_s$
number of independent datum values summed

$n_{sbelo}$
number of simulation-based equally-likely experiment test program outcomes

$n_{sdf}$
number of statistical degrees of freedom

$n_{spt}$
number of split-plot treatments

$n_{si}$
number of strength tests conducted in a strength experiment test program

$n_{t}$
number of treatments in an experiment test program

$n_{tc}$
number of treatment combinations in an experiment test program

$n_{wdv}$
number of weighted datum values

$n_{wrdv}$
number of weighted regression datum values in a simple linear weighted regression experiment test program
\( p \)  
probability

\( \text{PDF} \)  
probability density function, typically denoted \( f(-) \)

\( pf \)  
parametric probability of failure (or see below)

\( pf \)  
invariant probability of failure in each independent binomial trial or reliability test

\( pf^* \)  
a specific value of \( pf \), e.g., a value of the CDF percentile of specific interest in a reliability analysis

\( pfo \)  
probability of a favorable outcome

\( poosi \)  
probability of obtaining an outcome of specific interest

\( p(pp) \)  
plotting position (\( pp \)) stated in terms of the non-linear \( p \) ordinate metric on probability paper

\( ps \)  
parametric probability of survival (or see below)

\( ps \)  
invariant probability of survival in each independent binomial trial or reliability test

\( RCB\)D  
Randomized Complete Block Design experiment test program

\( \text{rdv}_i's \)  
the respective linear regression experiment test program datum values, where each \( \text{rdv}_i \) is associated with its underlying \( ivv_i \)

\( rnc \)  
run-out number of cycles (valid only for mechanical modes of failure with a conceptual statistical distribution for its threshold initiation value)

\( rnc^* \)  
a pre-determined value for run-out number of cycles

\( s(50) \)  
the actual value for the metric pertaining to the median of the presumed conceptual strength (resistance) statistical distribution

\( s_a \)  
alternating stress amplitude

\( sc \)  
scalar coefficient

\( scp \)  
statistical confidence probability

\( sddv's \)  
stopping distance datum values

\( smpvmd \)  
standardized minimum practical value of the maximum difference among the respective \( ctKm \)'s

\( snc \)  
suspension number of cycles, viz., the number of cycles imposed before the arbitrary suspension of a given test in a life (endurance) experiment test program

\( snc^* \)  
pre-determined value for the number of cycles imposed before Type I censoring (deliberate suspension) of each individual test in a life (endurance) experiment test program

\( sp \)  
statistical power

\( spsr \)  
sum of the positive signed-ranks (the test statistic in a signed-ranks test)

\( (SS) \)  
Sum(s) of Squares

\( lxxiv \)
Statistical weight (also relative statistical weight in Supplemental Topic 7B).

Translated independent variable value, viz., \( tivv_i = ivv_i - \text{ave}(tivv_i)'s \). (Note that the \( tivv_i \)'s sum to zero and consequently the \( |tivv_i| \)'s column vector is orthogonal to the \( |+1| \)'s column vector.)

Translated regression datum value, viz., \( trdv_i = rdv_i - \text{ave}(rdv_i)'s \).

Technically verbalized as the actual value for the variance of the conceptual statistical or sampling distribution that consists of all possible realization values for the random variable or statistic (-).

Technically verbalized as the actual value for the variance of the conceptual statistical distribution that consists of \( APR(-)EE \)'s (pertains to all blocks and all treatments or treatment combinations, or to all \( ivv \)'s of specific interest).

Plotting position (\( pp \)) stated in terms of the linear \( y \) ordinate metric on probability paper.

Weighted datum values.

Conceptual Weighted Simple Linear Regression Datum Values (overly succinct notation for Conceptual Random Heteroscedastic Normally Distributed Weighted Simple Linear Regression Datum Values). Weighted regression datum values carry the subscript \( i \) to connote that the associated (concomitant) \( ivv_i \).

Weighted simple linear regression experiment test program datum values, viz., the realizations of the corresponding \( WRDV_i \)'s.
MECHANICAL DESIGN PROLOGUE

The first step in mechanical design for a new product is to synthesize (configure) the product and its components such that it performs the desired function. Design synthesis is enhanced by first recognizing functional analogies among existing designs that are known to perform well in service and then suggesting several alternative designs based on these functional analogies. In turn, when well-defined objective criteria have been employed to compare these alternative designs to establish the design that has the greatest overall advantage, the proposed design can reasonably be viewed as being both feasible and practical. The next step in mechanical design for a new product is to attempt to assure that the proposed design will exhibit adequate reliability in service operation. Tentative assurance of adequate reliability for the new product requires a combination of \((i)\) pseudo-quantitative design analyses that involve analytical bogies such as design allowable and/or factors of safety, and \((ii)\) laboratory tests involving experimental bogies based on (reasonably) extreme load and environment histories. However, it is imperative to understand that adequate reliability for the new product can be demonstrated only by its actual (future) performance in service. Nevertheless, a combination of pseudo-quantitative design analysis and laboratory testing can generally be employed either to maintain or to improve the reliability of an existing product.

When the mechanical design objective is to maintain the service-proven reliability of a re-designed product, the re-design must meet the analytical and experimental bogies that were met by the present design. However, when the mechanical design objective is to improve the reliability of a re-designed product, the re-design must excel these analytical and experimental bogies. Moreover, the improved laboratory test performance for the re-design must be demonstrated statistically before it is rational to presume that the reliability of the re-design will excel the reliability of the present design. This statistical demonstration is clearly much more credible when \((i)\) the reliability improvement experiment test program is conducted using load and environment histories that are as nominally identical to the actual service load and environment histories as practical, and, in particular, \((ii)\) each of the respective laboratory test failures are identical in location, mode of failure, and fracture appearance to the failures that presumably will occur in service.

This text is primarily concerned with the statistical analyses of life and strength data generated by reliability improvement experiment test programs. Accordingly, experiment test program planning and probability concepts are presented and discussed before presenting and illustrating various statistical analyses and their mechanical reliability applications.