Package 'contingencytables'

October 9, 2023

Title Statistical Analysis of Contingency Tables

Version 2.2.0

Description Provides functions to perform statistical inference of data organized in contingency tables. This package is a companion to the ``Statistical Analysis of Contingency Tables'' book by Fagerland et al. <ISBN 9781466588172>.

License GPL-3

Encoding UTF-8

RoxygenNote 7.2.3

URL https://contingencytables.com/
https://ocbe-uio.github.io/contingencytables/

BugReports https://github.com/ocbe-uio/contingencytables/issues

Imports MASS, boot, methods

Suggests testthat

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NeedsCompilation no

Author Morten Wang Fagerland [aut],
Stian Lydersen [ctb],
Petter Laake [ctb],
Waldir Leoncio [cre],
Ole Christian Lingjærde [trl],
Brad J. Biggerstaff [ctb]

Maintainer Waldir Leoncio <w.l.netto@medisin.uio.no>

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R topics documented:

`.onAttach` *Prints welcome message on package load*

Description

Prints package version number and welcome message on package load

Usage

```
.onAttach(libname, pkgname)
```

Arguments

`libname`	library location. See `?base::.onAttach` for details
`pkgname`	package name. See `?base::.onAttach` for details

`Adjusted_inv_sinh_CI_OR_2x2`
The adjusted inverse hyperbolic sine confidence interval for the odds ratio

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Description

The adjusted inverse hyperbolic sine confidence interval for the odds ratio.

Described in Chapter 4 "The 2x2 Table"

Usage

```
Adjusted_inv_sinh_CI_OR_2x2(n, psi1 = 0.45, psi2 = 0.25, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`psi1`	pseudo-frequency (should be > 0)
`psi2`	pseudo-frequency (should be > 0)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Adjusted_inv_sinh_CI_OR_2x2(lampasona_2013)
Adjusted_inv_sinh_CI_OR_2x2(ritland_2007)
```

Adjusted_inv_sinh_CI_ratio_2x2

The adjusted inverse hyperbolic sine confidence interval for the ratio of probabilities

---

Description

The adjusted inverse hyperbolic sine confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Adjusted_inv_sinh_CI_ratio_2x2(
  n,
  psi1 = 0,
  psi2 = 0,
  psi3 = 0,
  psi4 = 1,
  alpha = 0.05
)
```

Arguments

n	the observed counts (a 2x2 matrix)
psi1	pseudo-frequency
psi2	pseudo-frequency
psi3	pseudo-frequency
psi4	pseudo-frequency
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Adjusted_inv_sinh_CI_ratio_2x2(perondi_2004)
Adjusted_inv_sinh_CI_ratio_2x2(ritland_2007)
```

`Adjusted_log_CI_2x2` *The adjusted log confidence interval for the ratio of probabilities*

Description

The adjusted log confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Adjusted_log_CI_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Adjusted_log_CI_2x2(perondi_2004)
Adjusted_log_CI_2x2(ritland_2007)
```

`AgrestiCaffo_CI_2x2` *The Agresti-Caffo confidence interval for the difference between probabilities*

Description

The Agresti-Caffo confidence interval for the difference between probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
AgrestiCaffo_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
AgrestiCaffo_CI_2x2(perondi_2004)
AgrestiCaffo_CI_2x2(ritland_2007)
```

AgrestiCoull_CI_1x2 *The Agresti-Coull confidence interval for the binomial probability*

Description

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
AgrestiCoull_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

References

Agresti A, Coull BA (1998) Approximate is better than "exact" for interval estimation of binomial proportions. The American Statistician; 52:119-126

See Also

Wald_CI_1x2

Examples

```
AgrestiCoull_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
AgrestiCoull_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
AgrestiCoull_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], AgrestiCoull_CI_1x2(X, n)) # alternative syntax
AgrestiCoull_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

Arcsine_CI_1x2 *Arcsine confidence interval*

Description

The Arcsine confidence interval for the binomial probability (with Anscombe variance stabilizing transformation) Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Arcsine_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Anscombe FJ (1948) The transformation of Poisson, binomial and negative binomial data. Biometrika; 35:246-254

Examples

```
Arcsine_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
Arcsine_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
Arcsine_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], Arcsine_CI_1x2(X, n)) # alternative syntax
Arcsine_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

BaptistaPike_exact_conditional_CI_2x2

The Baptista-Pike exact conditional confidence interval for the odds ratio

Description

The Baptista-Pike exact conditional confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
BaptistaPike_exact_conditional_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
BaptistaPike_exact_conditional_CI_2x2(tea)
BaptistaPike_exact_conditional_CI_2x2(perondi_2004)
BaptistaPike_exact_conditional_CI_2x2(lampasona_2013)
BaptistaPike_exact_conditional_CI_2x2(ritland_2007)
```

BaptistaPike_midP_CI_2x2

The Baptista-Pike mid-P confidence interval for the odds ratio

Description

The Baptista-Pike mid-P confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
BaptistaPike_midP_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
BaptistaPike_midP_CI_2x2(tea)
BaptistaPike_midP_CI_2x2(perondi_2004)
BaptistaPike_midP_CI_2x2(lampasona_2013)
BaptistaPike_midP_CI_2x2(ritland_2007)
```

---

bentur_2009 *Airway hyper-responsiveness before and after stem cell transplantation*

Description

Airway hyper-responsiveness before and after stem cell transplantation

Usage

```
bentur_2009
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Bentur et al. (2009)

Bhapkar_test_paired_cxc *The Bhapkar test for marginal homogeneity*

Description

The Bhapkar test for marginal homogeneity

Described in Chapter 9 "The Paired cxc Table"

Usage

```
Bhapkar_test_paired_cxc(n)
```

Arguments

n	the observed table (a cxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Bhapkar_test_paired_cxc(peterson_2007)
```

Blaker_exact_CI_1x2 *The Blaker exact confidence interval*

Description

The Blaker exact confidence interval for the binomial probability Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Blaker_exact_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Blaker H (2000) Confidence curves and improved exact confidence intervals for discrete distributions. The Canadian Journal of Statistics; 28:783-798

Examples

```
Blaker_exact_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
Blaker_exact_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
Blaker_exact_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], Blaker_exact_CI_1x2(X, n)) # alternative syntax
Blaker_exact_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

`Blaker_exact_test_1x2` *The Blaker exact test*

Description

The Blaker exact test for the binomial probability (pi) H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided) Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Blaker_exact_test_1x2(X, n, pi0)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`pi0`	a given probability

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Blaker H (2000) Confidence curves and improved exact confidence intervals for discrete distributions. The Canadian Journal of Statistics; 28:783-798

Examples

```
Blaker_exact_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.513)
Blaker_exact_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.513)
Blaker_exact_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.513)
Blaker_exact_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.513)
Blaker_exact_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.5)
```

Blaker_midP_CI_1x2 *The Blaker mid-P confidence interval for the binomial probability*

Description

The Blaker mid-P confidence interval for the binomial probability Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Blaker_midP_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Blaker H (2000) Confidence curves and improved exact confidence intervals for discrete distributions. The Canadian Journal of Statistics; 28:783-798

Examples

```
Blaker_midP_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
Blaker_midP_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
Blaker_midP_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], Blaker_midP_CI_1x2(X, n)) # alternative syntax
Blaker_midP_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

Blaker_midP_test_1x2 *The Blaker mid-P test*

Description

The Blaker mid-P test for the binomial probability (pi) H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided) Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Blaker_midP_test_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Blaker H (2000) Confidence curves and improved exact confidence intervals for discrete distributions. The Canadian Journal of Statistics; 28:783-798

Examples

```
Blaker_midP_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.513)
Blaker_midP_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.513)
Blaker_midP_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.513)
Blaker_midP_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.513)
Blaker_midP_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.5)
```

BonettPrice_hybrid_Wilson_score_CI_CC_paired_2x2 *The Bonett-Price hybrid Wilson score confidence interval for the ratio of paired probabilities*

Description

The Bonett-Price hybrid Wilson score confidence interval for the ratio of paired probabilities

with continuity correction

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
BonettPrice_hybrid_Wilson_score_CI_CC_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
BonettPrice_hybrid_Wilson_score_CI_CC_paired_2x2(bentur_2009)
BonettPrice_hybrid_Wilson_score_CI_CC_paired_2x2(cavo_2012)
```

BonettPrice_hybrid_Wilson_score_CI_paired_2x2

The Bonett-Price hybrid Wilson score confidence interval for the ratio of paired probabilities

---

Description

The Bonett-Price hybrid Wilson score confidence interval for the ratio of paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
BonettPrice_hybrid_Wilson_score_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
BonettPrice_hybrid_Wilson_score_CI_paired_2x2(bentur_2009)
BonettPrice_hybrid_Wilson_score_CI_paired_2x2(cavo_2012)
```

Bonferroni_type_CIs_paired_cxc

Bonferroni-type confidence intervals for differences of marginal probabilities

Description

Bonferroni-type confidence intervals for differences of marginal probabilities

Described in Chapter 9 "The Paired kxk Table"

Usage

```
Bonferroni_type_CIs_paired_cxc(n, alpha = 0.05)
```

Arguments

n	the observed table (a cxc matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Bonferroni_type_CIs_paired_cxc(peterson_2007)
```

Bonferroni_type_CIs_rxc

The Bonferroni-type simultaneous confidence intervals for the differences pi_1|i - pi_1|j

Description

The Bonferroni-type simultaneous confidence intervals for the differences pi_1|i - pi_1|j

Described in Chapter 7 "The rxc Table"

Usage

```
Bonferroni_type_CIs_rxc(n, alpha = 0.05)
```

Arguments

n	the observed counts (an rx2 vector)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Bonferroni_type_CIs_rxc(table_7.3)
```

`Brant_test_2xc` *The Brant test for the proportional odds assumption*

Description

The Brant test for the proportional odds assumption

Described in Chapter 6 "The Ordered 2xc Table"

Usage

```
Brant_test_2xc(n)
```

Arguments

`n`	the observed table (a 2xc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Brant_test_2xc(fontanella_2008)
Brant_test_2xc(lydersen_2012a)
```

BreslowDay_homogeneity_test_stratified_2x2 *The Breslow-Day test of homogeneity of odds ratios over strata*

Description

The Breslow-Day test of homogeneity of odds ratios over strata with

Tarone correction

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
BreslowDay_homogeneity_test_stratified_2x2(n)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
BreslowDay_homogeneity_test_stratified_2x2(doll_hill_1950)
BreslowDay_homogeneity_test_stratified_2x2(hine_1989)
```

cavo_2012 *Complete response before and after consolidation therapy*

Description

Complete response before and after consolidation therapy

Usage

```
cavo_2012
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Cavo et al. (2012)

Chacko_test_1xc *The Chacko test for order-restriction*

Description

Described in Chapter 3, "The 1xc Table and the Multinomial Distribution", Chacko (1966) derived a test based on the Pearson chi-square statistic to test the hypothesis that the categories of a multinomial variable with c possible outcomes have a natural ordering. The test statistic is asymptotically chi-squared distributed.

Usage

```
Chacko_test_1xc(n)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Chacko, V. J. (1966). Modified chi-square test for ordered alternatives. Sankhyā: The Indian Journal of Statistics, Series B, 185-190.

Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL.

Examples

```
Chacko_test_1xc(hypothetical)
```

chap1 *Chapter 1: Introduction*

Description

There are no functions for Chapter 1 (Introduction), only from Chapters 2 to 10.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap10 *Chapter 10: Stratified 2x2 Tables and Meta-Analysis*

Description

These are the functions related to chapter 10:

1. BreslowDay_homogeneity_test_stratified_2x2
2. CochranMantelHaenszel_test_stratified_2x2
3. Cochran_Q_test_stratified_2x2
4. InverseVariance_estimate_stratified_2x2
5. ML_estimates_and_CIs_stratified_2x2
6. MantelHaenszel_estimate_stratified_2x2
7. Pearson_LR_homogeneity_test_stratified_2x2
8. Pearson_LR_test_common_effect_stratified_2x2
9. Peto_homogeneity_test_stratified_2x2
10. Peto_OR_estimate_stratified_2x2
11. RBG_test_and_CI_stratified_2x2
12. Wald_test_and_CI_common_diff_stratified_2x2
13. Wald_test_and_CI_common_ratio_stratified_2x2
14. Woolf_test_and_CI_stratified_2x2
15. stratified_2x2_tables

Note

You can also print the list above with `list_functions(10)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap2 *Chapter 2: The 1x2 Table and the Binomial Distribution*

Description

These are the functions related to chapter 2:

1. AgrestiCoull_CI_1x2
2. Arcsine_CI_1x2
3. Wald_CI_1x2
4. Blaker_exact_CI_1x2
5. Blaker_exact_test_1x2
6. Blaker_midP_CI_1x2
7. Blaker_midP_test_1x2
8. ClopperPearson_exact_CI_1x2
9. ClopperPearson_midP_CI_1x2
10. Exact_binomial_test_1x2
11. Jeffreys_CI_1x2
12. LR_CI_1x2
13. LR_test_1x2
14. MidP_binomial_test_1x2
15. Score_test_1x2
16. Score_test_CC_1x2
17. Wald_CI_CC_1x2
18. Wilson_score_CI_1x2
19. Wilson_score_CI_CC_1x2
20. the_1x2_table_CIs
21. Wald_test_1x2
22. Wald_test_CC_1x2
23. the_1x2_table_tests

Note

You can also print the list above with `list_functions(2)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap3 *Chapter 3: The 1xc Table and the Multinomial Distribution*

Description

These are the functions related to chapter 3:

1. Chacko_test_1xc
2. Exact_multinomial_test_1xc
3. Gold_Wald_CIs_1xc
4. Goodman_Wald_CIs_1xc
5. Goodman_Wald_CIs_for_diffs_1xc
6. Goodman_Wilson_score_CIs_1xc
7. LR_test_1xc
8. MidP_multinomial_test_1xc
9. Pearson_chi_squared_test_1xc
10. QuesenberryHurst_Wilson_score_CIs_1xc
11. the_1xc_table_CIs
12. the_1xc_table_tests

Note

You can also print the list above with `list_functions(3)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap4 *Chapter 4: The 2x2 Table*

Description

These are the functions related to chapter 4:

1. Adjusted_inv_sinh_CI_OR_2x2
2. Adjusted_inv_sinh_CI_ratio_2x2
3. Adjusted_log_CI_2x2
4. AgrestiCaffo_CI_2x2
5. Wald_CI_2x2
6. BaptistaPike_exact_conditional_CI_2x2
7. BaptistaPike_midP_CI_2x2
8. Cornfield_exact_conditional_CI_2x2
9. Cornfield_midP_CI_2x2
10. Fisher_exact_test_2x2
11. Exact_unconditional_test_2x2
12. Fisher_midP_test_2x2
13. Gart_adjusted_logit_CI_2x2
14. Independence_smoothed_logit_CI_2x2
15. Inv_sinh_CI_OR_2x2
16. Inv_sinh_CI_ratio_2x2
17. Katz_log_CI_2x2
18. Koopman_asymptotic_score_CI_2x2
19. LR_test_2x2
20. Mee_asymptotic_score_CI_2x2
21. MiettinenNurminen_asymptotic_score_CI_difference_2x2
22. MiettinenNurminen_asymptotic_score_CI_OR_2x2
23. MiettinenNurminen_asymptotic_score_CI_ratio_2x2
24. MOVER_R_Wilson_CI_OR_2x2
25. MOVER_R_Wilson_CI_ratio_2x2
26. Newcombe_hybrid_score_CI_2x2
27. Pearson_chi_squared_test_2x2
28. Pearson_chi_squared_test_CC_2x2
29. PriceBonett_approximate_Bayes_CI_2x2
30. Wald_CI_CC_2x2
31. Woolf_logit_CI_2x2

32. Uncorrected_asymptotic_score_CI_2x2
33. Z_unpooled_test_2x2
34. the_2x2_table_CIs_difference
35. the_2x2_table_CIs_OR
36. the_2x2_table_CIs_ratio
37. the_2x2_table_tests

Note

You can also print the list above with `list_functions(4)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

---

chap5 *Chapter 5: The Ordered rx2 Table*

Description

These are the functions related to chapter 5:

1. CochranArmitage_CI_rx2
2. CochranArmitage_exact_cond_midP_tests_rx2
3. CochranArmitage_MH_tests_rx2
4. Exact_cond_midP_unspecific_ordering_rx2
5. Pearson_LR_tests_unspecific_ordering_rx2
6. the_rx2_table
7. Trend_estimate_CI_tests_rx2

Note

You can also print the list above with `list_functions(5)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap6 *Chapter 6: The Ordered 2xc Table*

Description

These are the functions related to chapter 6:

1. Brant_test_2xc
2. Cumulative_models_for_2xc
3. Exact_cond_midP_linear_rank_tests_2xc
4. ClopperPearson_exact_CI_1x2_beta_version
5. Exact_cond_midP_unspecific_ordering_rx2
6. MantelHaenszel_test_2xc
7. Pearson_LR_tests_cum_OR_2xc
8. Score_test_for_effect_in_the_probit_model_2xc
9. the_2xc_table

Note

You can also print the list above with `list_functions(6)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

chap7 *Chapter 7: The rxc Table*

Description

These are the functions related to chapter 7:

1. Bonferroni_type_CIs_rxc
2. Cumulative_models_for_rxc
3. Exact_cond_midP_tests_rxc
4. FisherFreemanHalton_asymptotic_test_rxc
5. gamma_coefficient_rxc_bca
6. gamma_coefficient_rxc

7. JonckheereTerpstra_test_rxc
8. Kendalls_tau_b_rxc
9. Kendalls_tau_b_rxc_bca
10. KruskalWallis_asymptotic_test_rxc
11. linear_by_linear_test_rxc
12. Pearson_correlation_coefficient_rxc
13. Pearson_correlation_coefficient_rxc_bca
14. Pearson_LR_tests_rxc
15. Pearson_residuals_rxc
16. Scheffe_type_CIs_rxc
17. Spearman_correlation_coefficient_rxc
18. Spearman_correlation_coefficient_rxc_bca
19. the_rxc_table

Note

You can also print the list above with `list_functions(7)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

---

chap8 *Chapter 8: The Paired 2x2 Table*

Description

These are the functions related to chapter 8:

1. BonettPrice_hybrid_Wilson_score_CI_CC_paired_2x2
2. BonettPrice_hybrid_Wilson_score_CI_paired_2x2
3. ClopperPearson_exact_CI_1x2_beta_version
4. McNemar_asymptotic_test_CC_paired_2x2
5. McNemar_asymptotic_test_paired_2x2
6. McNemar_exact_cond_test_paired_2x2
7. McNemar_exact_unconditional_test_paired_2x2
8. McNemar_midP_test_paired_2x2
9. Tang_asymptotic_score_CI_paired_2x2

10. Tango_asymptotic_score_CI_paired_2x2
11. MOVER_Wilson_score_CI_paired_2x2
12. Newcombe_square_and_add_CI_paired_2x2
13. Transformed_Blaker_exact_CI_paired_2x2
14. Transformed_Clopper_Pearson_exact_CI_paired_2x2
15. Transformed_Clopper_Pearson_midP_CI_paired_2x2
16. Transformed_Wilson_score_CI_paired_2x2
17. Wald_CI_diff_paired_2x2
18. Wald_CI_diff_CC_paired_2x2
19. Wald_CI_AgrestiMin_paired_2x2
20. Wald_CI_BonettPrice_paired_2x2
21. Wald_CI_OR_Laplace_paired_2x2
22. Wald_CI_OR_paired_2x2
23. Wald_CI_ratio_paired_2x2
24. the_paired_2x2_table_CIs_difference
25. the_paired_2x2_table_CIs_OR
26. the_paired_2x2_table_CIs_ratio
27. the_paired_2x2_table_tests

Note

You can also print the list above with `list_functions(8)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

`chap9` *Chapter 9: The Paired cxc Table*

Description

These are the functions related to chapter 9:

1. Bhapkar_test_paired_cxc
2. Bonferroni_type_CIs_paired_cxc
3. FleissEveritt_test_paired_cxc
4. FleissLevinPaik_test_paired_cxc

5. McNemarBowker_test_paired_cxc
6. Scheffe_type_CIs_paired_cxc
7. Score_test_and_CI_marginal_mean_scores_paired_cxc
8. Stuart_test_paired_cxc
9. Wald_test_and_CI_marginal_mean_ranks_paired_cxc
10. Wald_test_and_CI_marginal_mean_scores_paired_cxc
11. the_paired_cxc_table_nominal
12. the_paired_cxc_table_ordinal

Note

You can also print the list above with `list_functions(9)`.

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658

`ClopperPearson_exact_CI_1x2`

The Clopper-Pearson exact confidence interval

Description

The Clopper-Pearson exact confidence interval for the binomial probability Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
ClopperPearson_exact_CI_1x2(X, n, alpha = 0.05)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95#' CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
ClopperPearson_exact_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
ClopperPearson_exact_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
ClopperPearson_exact_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], ClopperPearson_exact_CI_1x2(X, n)) # alternative syntax
ClopperPearson_exact_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

ClopperPearson_exact_CI_1x2_beta_version

The Clopper-Pearson exact confidence interval for the binomial probability (beta version)

Description

The Clopper-Pearson exact confidence interval for the binomial probability

(defined via the beta distribution)

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
ClopperPearson_exact_CI_1x2_beta_version(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Brown LD, Cai T, DasGupta A (2001) Interval estimation for a binomial proportion. Statistical Science; 16:101-133

See Also

ClopperPearson_exact_CI_1x2

Examples

```
ClopperPearson_exact_CI_1x2_beta_version(singh_2010["1st", "X"], singh_2010["1st", "n"])
ClopperPearson_exact_CI_1x2_beta_version(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
ClopperPearson_exact_CI_1x2_beta_version(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], ClopperPearson_exact_CI_1x2_beta_version(X, n)) # alternative syntax
ClopperPearson_exact_CI_1x2_beta_version(ligarden_2010["X"], ligarden_2010["n"])
```

ClopperPearson_midP_CI_1x2

The Clopper-Pearson mid-P confidence interval

Description

The Clopper-Pearson mid-P confidence interval for the binomial probability Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
ClopperPearson_midP_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
ClopperPearson_midP_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
ClopperPearson_midP_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
ClopperPearson_midP_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], ClopperPearson_midP_CI_1x2(X, n)) # alternative syntax
ClopperPearson_midP_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

CochranArmitage_CI_rx2

The Cochran-Armitage confidence interval for trend in the linear model

Description

The Cochran-Armitage confidence interval for trend in the linear model

Described in Chapter 5 "The Ordered rx2 Table"

Usage

```
CochranArmitage_CI_rx2(n, a = seq_len(nrow(n)), alpha = 0.05)
```

Arguments

n	the observed counts (an rx2 matrix)
a	scores assigned to the rows
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
CochranArmitage_CI_rx2(mills_graubard_1987, c(1, 2, 3, 4, 5))
CochranArmitage_CI_rx2(indredavik_2008, c(1, 2, 3, 4, 5))
```

CochranArmitage_exact_cond_midP_tests_rx2

The Cochran-Armitage exact conditional and mid-P tests

Description

The Cochran-Armitage exact conditional and mid-P tests

Described in Chapter 5 "The Ordered rx2 Table"

Usage

```
CochranArmitage_exact_cond_midP_tests_rx2(n, a)
```

Arguments

n	the observed counts (an rx2 matrix)
a	scores assigned to the rows

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
## Not run:
CochranArmitage_exact_cond_midP_tests_rx2(mills_graubard_1987, c(1, 2, 3, 4, 5))

## End(Not run)
CochranArmitage_exact_cond_midP_tests_rx2(indredavik_2008, c(1, 2, 3, 4, 5))
```

CochranArmitage_MH_tests_rx2

The Cochran-Armitage, modified Cochran-Armitage, and Mantel-Haenszel tests for trend

---

Description

Described in Chapter 5 "The Ordered rx2 Table"

Usage

```
CochranArmitage_MH_tests_rx2(n, a)
```

Arguments

n	the observed counts (an rx2 matrix)
a	scores assigned to the rows

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
CochranArmitage_MH_tests_rx2(mills_graubard_1987, c(1, 2, 3, 4, 5))
CochranArmitage_MH_tests_rx2(indredavik_2008, c(1, 2, 3, 4, 5))
```

CochranMantelHaenszel_test_stratified_2x2

The Cochran-Mantel-Haenszel test of a common odds ratio

Description

The Cochran-Mantel-Haenszel test of a common odds ratio

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
CochranMantelHaenszel_test_stratified_2x2(n)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
CochranMantelHaenszel_test_stratified_2x2(doll_hill_1950)
CochranMantelHaenszel_test_stratified_2x2(hine_1989)
```

Cochran_Q_test_stratified_2x2

The Cochran Q test of homogeneity of effects over strata

Description

The Cochran Q test of homogeneity of effects over strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Cochran_Q_test_stratified_2x2(n, link = "linear", estimatetype = "MH")
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)
link	the link function ('linear', 'log', or 'logit')
estimatetype	Mantel-Haenszel or inverse variance estimate ('MH' or 'IV')

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Cochran_Q_test_stratified_2x2(doll_hill_1950)
Cochran_Q_test_stratified_2x2(hine_1989)
```

`contingencytables` *Statistical Analysis of Contingency tables*

Description

Statistical Analysis of Contingency Tables is an invaluable tool for statistical inference in contingency tables. It covers effect size estimation, confidence intervals, and hypothesis tests for the binomial and the multinomial distributions, unpaired and paired 2x2 tables, rxc tables, ordered rx2 and 2xc tables, paired cxc tables, and stratified tables. This package provides functions that accompany the "Statistical Analysis of Contingency Tables" book by Fagerland et. al. <ISBN 9781466588172>.

Author(s)

Maintainer: Waldir Leoncio <w.l.netto@medisin.uio.no>

Authors:

- Morten Wang Fagerland <morten.fagerland@medisin.uio.no>

Other contributors:

- Stian Lydersen [contributor]
- Petter Laake [contributor]
- Ole Christian Lingjærde [translator]
- Brad J. Biggerstaff [contributor]

References

- Fagerland MW, Lydersen S, Laake P (2017) Statistical Analysis of Contingency Tables. Chapman & Hall/CRC, Boca Raton, FL
- https://contingencytables.com/
- https://www.routledge.com/Statistical-Analysis-of-Contingency-Tables/Fagerland-Lydersen-Laake/p/book/978146658
- https://ocbe-uio.github.io/contingencytables/

See Also

print.contingencytables_result to read about printing alternatives.

contingencytables_result *contingencytables_result class*

Description

A class for output of the main functions on this package

Usage

```
contingencytables_result(statistics, print_structure)
```

Arguments

`statistics`	Either a value or a list of values to be filled by print_format
`print_structure`	Either a string of a function instructing how to print the values from `statistics`

Value

an object of class `contingencytables_result`

Author(s)

Waldir Leoncio

See Also

print.contingencytables_result

Cornfield_exact_conditional_CI_2x2 *The Cornfield exact conditional confidence interval for the odds ratio*

Description

The Cornfield exact conditional confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Cornfield_exact_conditional_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Cornfield_exact_conditional_CI_2x2(tea)
Cornfield_exact_conditional_CI_2x2(perondi_2004)
Cornfield_exact_conditional_CI_2x2(lampasona_2013)
Cornfield_exact_conditional_CI_2x2(ritland_2007)
```

Cornfield_midP_CI_2x2 *The Cornfield mid-P confidence interval for the odds ratio*

Description

The Cornfield mid-P confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Cornfield_midP_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Cornfield_midP_CI_2x2(tea)
Cornfield_midP_CI_2x2(perondi_2004)
Cornfield_midP_CI_2x2(lampasona_2013)
Cornfield_midP_CI_2x2(ritland_2007)
```

Cumulative_models_for_2xc

Cumulative logit and probit models

Description

Cumulative logit and probit models

Described in Chapter 6 "The Ordered 2xc Table"

Usage

```
Cumulative_models_for_2xc(n, linkfunction = "logit", alpha = 0.05)
```

Arguments

n	the observed table (a 2xc matrix)
linkfunction	either "logit" or "probit"
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Cumulative_models_for_2xc(fontanella_2008)
Cumulative_models_for_2xc(lydersen_2012a)
```

Cumulative_models_for_rxc

Cumulative logit and probit models

Description

Cumulative logit and probit models

Described in Chapter 7 "The rxc Table"

Usage

```
Cumulative_models_for_rxc(n, linkfunction = "logit", alpha = 0.05)
```

Arguments

n	the observed table (an rxc matrix)
linkfunction	either "logit" or "probit"
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Cumulative_models_for_rxc(table_7.5)
Cumulative_models_for_rxc(table_7.6)
```

---

doll_hill_1950 *Smoking and lung cancer*

Description

Smoking and lung cancer

Usage

```
doll_hill_1950
```

Format

An object of class array of dimension 2 x 2 x 2.

References

Doll and Hill (1950)

Exact_binomial_test_1x2

The exact binomial test for the binomial probability (pi)

Description

H_0 pi = pi0 vs H_A: pi ~= pi0 (two-sided)

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Exact_binomial_test_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Exact_binomial_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.513)
Exact_binomial_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.513)
Exact_binomial_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.513)
Exact_binomial_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.513)
Exact_binomial_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.5)
```

Exact_cond_midP_linear_rank_tests_2xc

Exact conditional and mid-P linear rank tests

Description

Exact conditional and mid-P linear rank tests

Described in Chapter 6 "The Ordered 2xc Table"

Usage

```
Exact_cond_midP_linear_rank_tests_2xc(n, b = 0)
```

Arguments

n	the observed table (a 2xc matrix)
b	scores assigned to the columns (if b=0, midranks will be used as scores)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Exact_cond_midP_linear_rank_tests_2xc(lydersen_2012a)
Exact_cond_midP_linear_rank_tests_2xc(fontanella_2008)
```

Exact_cond_midP_tests_rxc

Exact conditional and mid-P tests for the rxc table

Description

Exact conditional and mid-P tests for the rxc table: the Fisher-Freeman-Halton, Pearson, likelihood ratio, Kruskal-Wallis, linear-by-linear, and Jonckheere-Terpstra tests.

Described in Chapter 7 "The rxc Table"

Usage

```
Exact_cond_midP_tests_rxc(n)
```

Arguments

n	the observed counts (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Note

Works only for 3x2 and 3x3 tables

Examples

```
Exact_cond_midP_tests_rxc(table_7.3)  # a 3x2 table
## Not run:
  Exact_cond_midP_tests_rxc(table_7.6) # a 3x3 table

## End(Not run)
```

Exact_cond_midP_unspecific_ordering_rx2

The exact conditional and mid-P tests for unspecific ordering

Description

The exact conditional and mid-P tests for unspecific ordering. May also be used for 2xc tables, after flipping rows and columns (i.e. if n is a 2xc table, call this function with n' (the transpose of n) as the first argument).

Described in Chapter 5 "The Ordered rx2 Table"

Usage

```
Exact_cond_midP_unspecific_ordering_rx2(n, direction, statistic = "Pearson")
```

Arguments

n	the observed counts (an rx2 matrix)
direction	the direction of the success probabilities ("increasing" or "decreasing")
statistic	the Pearson test statistic ("Pearson") or the likelihood ratio test statistic ("LR"). Can also be used for cumulative ORs in 2xc tables with "PearsonCumOR" or "LRCumOR".

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Chapter 6: Postoperative nausea (Lydersen et al., 2012a)
n <- t(lydersen_2012a)
Exact_cond_midP_unspecific_ordering_rx2(n, "decreasing")
Exact_cond_midP_unspecific_ordering_rx2(n, "decreasing", "PearsonCumOR")
```

Exact_multinomial_test_1xc

The exact multinomial test for multinomial probabilities

Description

The exact multinomial test for multinomial probabilities

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Exact_multinomial_test_1xc(n, pi0)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
pi0	given probabilities (a 1xc vector)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
Exact_multinomial_test_1xc(n = snp6498169$complete$n, pi0 = snp6498169$complete$pi0)

# subset of 10 patients
Exact_multinomial_test_1xc(n = snp6498169$subset$n, pi0 = snp6498169$subset$pi0)
```

Exact_unconditional_test_2x2

Exact unconditional test for association in 2x2 tables

Description

Exact unconditional test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
Exact_unconditional_test_2x2(n, statistic = "Pearson", gamma = 1e-04)
```

Arguments

n	the observed counts (a 2x2 matrix)
statistic	'Pearson' (Suissa-Shuster test default), 'LR' (likelihood ratio), ' unpooled' (unpooled Z), or 'Fisher' (Fisher-Boschloo test)
gamma	parameter for the Berger and Boos procedure (default=0.0001 gamma=0: no adj)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Note

Somewhat crude code with maximization over a simple partition of the nuisance parameter space into 'num_pi_values' equally spaced values (default: 1000). The number may be changed below. This method could be improved with a better algorithm for the maximization however, it works well for most purposes. Try 'showplot=TRUE' to get an indication of the precision. A refinement of the maximization can be done with a manual restriction of the parameter space.

Examples

```
Exact_unconditional_test_2x2(tea)
Exact_unconditional_test_2x2(perondi_2004)
Exact_unconditional_test_2x2(lampasona_2013)
Exact_unconditional_test_2x2(ritland_2007)
```

---

ezra_2010 *Floppy eyelid syndrome vs obstructive sleep apnea*

Description

Floppy eyelid syndrome vs obstructive sleep apnea

Usage

```
ezra_2010
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Ezra et al. (2010)

---

fischer_1999 *A comparison between serial and retrospective measurements*

Description

A comparison between serial and retrospective measurements

Usage

```
fischer_1999
```

Format

An object of class `matrix` (inherits from `array`) with 5 rows and 5 columns.

References

Fischer et al. (1999)

`FisherFreemanHalton_asymptotic_test_rxc` *The Fisher-Freeman-Halton asymptotic test for unordered rxc tables*

Description

The Fisher-Freeman-Halton asymptotic test for unordered rxc tables

Described in Chapter 7 "The rxc Table"

Usage

```
FisherFreemanHalton_asymptotic_test_rxc(n)
```

Arguments

`n`	the observed counts (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Note

May not give results for all tables, due to overflow

Examples

```
FisherFreemanHalton_asymptotic_test_rxc(table_7.3)
```

`Fisher_exact_test_2x2` *The Fisher exact test for association in 2x2 tables*

Description

The Fisher exact test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
Fisher_exact_test_2x2(n, statistic = "Pearson")
```

Arguments

n	the observed counts (a 2x2 matrix)
statistic	'hypergeometric' (i.e. Fisher-Irwin; default), 'Pearson', or 'LR' (likelihood ratio)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Fisher_exact_test_2x2(tea)
Fisher_exact_test_2x2(perondi_2004)
Fisher_exact_test_2x2(lampasona_2013)
Fisher_exact_test_2x2(ritland_2007)
```

`Fisher_midP_test_2x2` *The Fisher mid-P test for association in 2x2 tables*

Description

The Fisher mid-P test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
Fisher_midP_test_2x2(n, statistic = "hypergeometric")
```

Arguments

n	the observed counts (a 2x2 matrix)
statistic	'hypergeometric' (i.e. Fisher-Irwin default), 'Pearson', or 'LR' (likelihood ratio)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Fisher_midP_test_2x2(tea)
Fisher_midP_test_2x2(perondi_2004)
Fisher_midP_test_2x2(lampasona_2013)
Fisher_midP_test_2x2(ritland_2007)
```

FleissEveritt_test_paired_cxc

The Fleiss-Everitt version of the Stuart test for marginal homogeneity

Description

The Fleiss-Everitt version of the Stuart test for marginal homogeneity

Described in Chapter 9 "The Paired cxc Table"

Usage

```
FleissEveritt_test_paired_cxc(n)
```

Arguments

n	the observed table (a cxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
FleissEveritt_test_paired_cxc(fleiss_2003)
```

FleissLevinPaik_test_paired_cxc

The Fleiss-Levin-Paik test for three-level ordinal outcomes

Description

The Fleiss-Levin-Paik test for three-level ordinal outcomes

Described in Chapter 9 "The Paired cxc Table"

Usage

```
FleissLevinPaik_test_paired_cxc(n)
```

Arguments

n	the observed table (a cxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Pretherapy susceptability of pathogens *without the N / A category*
FleissLevinPaik_test_paired_cxc(peterson_2007[-4, -4])
```

`fleiss_2003` *Table 13.6, page 382, of Fleiss et al. (2003)*

Description

Table 13.6, page 382, of Fleiss et al. (2003)

Usage

```
fleiss_2003
```

Format

An object of class `matrix` (inherits from `array`) with 3 rows and 3 columns.

References

Fleiss et al. (2003)

`fontanella_2008` *The Adolescent Placement Study*

Description

The Adolescent Placement Study

Usage

```
fontanella_2008
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 4 columns.

References

Fontanella et al. (2008)

gamma_coefficient_rxc *The gamma coefficient*

Description

The gamma coefficient

Described in Chapter 7 "The rxc Table"

Usage

```
gamma_coefficient_rxc(n)
```

Arguments

n	the observed table (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
gamma_coefficient_rxc(table_7.7)
gamma_coefficient_rxc(table_7.8)
gamma_coefficient_rxc(table_7.9)
```

gamma_coefficient_rxc_bca *The gamma coefficient with the bias-corrected and accelerated boostrap confidence interval*

Description

The gamma coefficient with the bias-corrected and accelerated boostrap confidence interval

Described in Chapter 7 "The rxc Table"

Usage

```
gamma_coefficient_rxc_bca(n, nboot = 10000, alpha = 0.05)
```

Arguments

n	the observed table (an rxc matrix)
nboot	number of bootstrap samples
alpha	the nominal significance level, used to compute a 100(1-alpha) confidence interval

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
set.seed(9623)
gamma_coefficient_rxc_bca(table_7.7, nboot = 800)
gamma_coefficient_rxc_bca(table_7.8, nboot = 200)
## Not run:
  gamma_coefficient_rxc_bca(table_7.9, nboot = 3000, alpha = 0.2)

## End(Not run)
```

Gart_adjusted_logit_CI_2x2

The Gart adjusted logit confidence interval for the odds ratio

---

Description

The Gart adjusted logit confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Gart_adjusted_logit_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Gart_adjusted_logit_CI_2x2(lampasona_2013)
Gart_adjusted_logit_CI_2x2(ritland_2007)
```

Gold_Wald_CIs_1xc *The Gold Wald simultaneous intervals for the multinomial probabilities*

Description

The Gold Wald simultaneous intervals for the multinomial probabilities (with Scheffe adjustment)

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Gold_Wald_CIs_1xc(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Gold_Wald_CIs_1xc(n = snp6498169$complete$n)
```

Goodman_Wald_CIs_1xc *The Goodman Wald simultaneous intervals for the multinomial probabilities*

Description

The Goodman Wald simultaneous intervals for the multinomial probabilities

(with Bonferroni adjustment)

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Goodman_Wald_CIs_1xc(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Goodman_Wald_CIs_1xc(n = snp6498169$complete$n)
```

Goodman_Wald_CIs_for_diffs_1xc *The Goodman Wald simultaneous intervals for the differences between the*

Description

The Goodman Wald simultaneous intervals for the differences between the

multinomial probabilities (with Scheffe or Bonferroni adjustment)

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Goodman_Wald_CIs_for_diffs_1xc(n, alpha = 0.05, adjustment = "Bonferroni")
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95# CIs
adjustment	Scheffe or Bonferroni adjustment ("Scheffe" or "Bonferroni")

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Goodman_Wald_CIs_for_diffs_1xc(n = snp6498169$complete$n)
```

Goodman_Wilson_score_CIs_1xc

The Goodman Wilson score simultaneous intervals for the multinomial probabilities

Description

The Goodman Wilson score simultaneous intervals for the multinomial probabilities

(with Bonferroni adjustment)

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Goodman_Wilson_score_CIs_1xc(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Goodman_Wilson_score_CIs_1xc(n = snp6498169$complete$n)
```

hine_1989

Prophylactice use of Lidocaine in myocardial infarction

Description

Prophylactice use of Lidocaine in myocardial infarction

Usage

```
hine_1989
```

Format

An object of class `array` of dimension 2 x 2 x 6.

References

Hine et al. (1989)

hypothetical *Hypothetical experiment*

Description

Hypothetical experiment

Usage

```
hypothetical
```

Format

An object of class `numeric` of length 5.

Independence_smoothed_logit_CI_2x2 *The Independence-smoothed logit confidence interval for the odds ratio*

Description

The Independence-smoothed logit confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Independence_smoothed_logit_CI_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed table (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Independence_smoothed_logit_CI_2x2(lampasona_2013)
Independence_smoothed_logit_CI_2x2(ritland_2007)
```

indredavik_2008 *Elevated troponin T levels in stroke patients*

Description

Elevated troponin T levels in stroke patients

Usage

```
indredavik_2008
```

Format

An object of class `matrix` (inherits from `array`) with 5 rows and 2 columns.

References

Indredavik et al. (2008)

InverseVariance_estimate_stratified_2x2 *The inverse variance estimate of the overall effect across strata*

Description

The inverse variance estimate of the overall effect across strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
InverseVariance_estimate_stratified_2x2(n, link = "logit")
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`link`	the link function ('linear', 'log', or 'logit')

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
InverseVariance_estimate_stratified_2x2(doll_hill_1950)
InverseVariance_estimate_stratified_2x2(hine_1989)
```

Inv_sinh_CI_OR_2x2 *The inverse hyperbolic sine confidence interval for the odds ratio*

Description

The inverse hyperbolic sine confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Inv_sinh_CI_OR_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Inv_sinh_CI_OR_2x2(lampasona_2013)
Inv_sinh_CI_OR_2x2(ritland_2007)
```

Inv_sinh_CI_ratio_2x2 *The inverse hyperbolic sine confidence interval for the ratio of probabilities*

Description

The inverse hyperbolic sine confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Inv_sinh_CI_ratio_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Inv_sinh_CI_ratio_2x2(perondi_2004)
Inv_sinh_CI_ratio_2x2(ritland_2007)
```

Jeffreys_CI_1x2 *Jeffreys confidence interval for the binomial probability*

Description

Jeffreys confidence interval for the binomial probability

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Jeffreys_CI_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
Jeffreys_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
Jeffreys_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
Jeffreys_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], Jeffreys_CI_1x2(X, n)) # alternative syntax
Jeffreys_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

JonckheereTerpstra_test_rxc *The Jonckheere-Terpstra test for association*

Description

The Jonckheere-Terpstra test for association

Described in Chapter 7 "The rxc Table"

Usage

```
JonckheereTerpstra_test_rxc(n)
```

Arguments

n	the observed table (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
JonckheereTerpstra_test_rxc(table_7.7)
JonckheereTerpstra_test_rxc(table_7.8)
JonckheereTerpstra_test_rxc(table_7.9)
```

Katz_log_CI_2x2 *The Katz log confidence interval for the ratio of probabilities*

Description

The Katz log confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Katz_log_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Katz_log_CI_2x2(perondi_2004)
Katz_log_CI_2x2(ritland_2007)
```

Kendalls_tau_b_rxc *Kendall's tau-b with confidence interval based on the Fieller standard deviation*

Description

Kendall's tau-b with confidence interval based on the Fieller standard deviation

Described in Chapter 7 "The rxc Table"

Usage

```
Kendalls_tau_b_rxc(n, alpha = 0.05)
```

Arguments

`n`	the observed table (an rxc matrix)
`alpha`	the nominal significance level, used to compute a 100(1-alpha)% confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Kendalls_tau_b_rxc(table_7.7)
Kendalls_tau_b_rxc(table_7.8)
Kendalls_tau_b_rxc(table_7.9)
```

Kendalls_tau_b_rxc_bca

Kendall's tau-b with the bias-corrected and accelerated boostrap confidence interval

Description

Kendall's tau-b with the bias-corrected and accelerated boostrap confidence interval

Described in Chapter 7 "The rxc Table"

Usage

```
Kendalls_tau_b_rxc_bca(n, nboot = 10000, alpha = 0.05)
```

Arguments

n	the observed table (an rxc matrix)
nboot	number of bootstrap samples
alpha	the nominal significance level, used to compute a 100(1-alpha) confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
set.seed(9974)
Kendalls_tau_b_rxc_bca(table_7.7, nboot = 800)
Kendalls_tau_b_rxc_bca(table_7.8, nboot = 200)
## Not run:
  Kendalls_tau_b_rxc_bca(table_7.9)

## End(Not run)
```

Koopman_asymptotic_score_CI_2x2

The Koopman asymptotic score confidence interval for the ratio of probabilities

Description

The Koopman asymptotic score confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Koopman_asymptotic_score_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Note

This versions uses the score test statistic of the Miettinen-Nurminen interval without the variance correction term.

Examples

```
Koopman_asymptotic_score_CI_2x2(perondi_2004)
Koopman_asymptotic_score_CI_2x2(ritland_2007)
```

KruskalWallis_asymptotic_test_rxc

The Kruskal-Wallis asymptotic test for singly ordered rxc tables

---

Description

The Kruskal-Wallis asymptotic test for singly ordered rxc tables

Described in Chapter 7 "The rxc Table"

Usage

```
KruskalWallis_asymptotic_test_rxc(n)
```

Arguments

n	the observed counts (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
KruskalWallis_asymptotic_test_rxc(table_7.5)
KruskalWallis_asymptotic_test_rxc(table_7.6)
```

lampasona_2013 *A case-control study of GADA exposure on IPEX syndrome*

Description

A case-control study of GADA exposure on IPEX syndrome

Usage

```
lampasona_2013
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Lampasona et al. (2013)

ligarden_2010 *Ligarden et al., 2010*

Description

Ligarden et al., 2010

Usage

```
ligarden_2010
```

Format

An object of class `numeric` of length 2.

References

ligarden_2010

linear_by_linear_test_rxc *The linear-by-linear test for association*

Description

The linear-by-linear test for association

Described in Chapter 7 "The rxc Table"

Usage

```
linear_by_linear_test_rxc(n, a = seq_len(ncol(n)), b = seq_len(nrow(n)))
```

Arguments

n	the observed table (an rxc matrix)
a	scores assigned to the rows
b	scores assigned to the columns

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
linear_by_linear_test_rxc(table_7.7)
linear_by_linear_test_rxc(table_7.8)
linear_by_linear_test_rxc(table_7.9)
```

list_functions *List functions from a chapter*

Description

Complements the `?chapX` command by printing a list of functions related to a particular chapter `X` on the R console.

Usage

```
list_functions(chap_num)
```

Arguments

chap_num	Number of book chapter (from 2 to 10)

Value

List of functions from that chapter

Author(s)

Waldir Leoncio

`LR_CI_1x2` *The likelihood ratio confidence interval for the binomial probability*

Description

The likelihood ratio confidence interval for the binomial probability. Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
LR_CI_1x2(X, n, alpha = 0.05)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
LR_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
LR_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
LR_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], LR_CI_1x2(X, n)) # alternative syntax
LR_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

LR_test_1x2 *The likelihood ratio test for the binomial probability (pi)*

Description

The likelihood ratio test for the binomial probability (pi) H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided). Described in Chapter 2 "The 1x2 Table and the Binomial Distribution".

Usage

```
LR_test_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
LR_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = .5)
LR_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = .5)
LR_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = .5)
LR_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = .5)
LR_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = .5)
```

LR_test_1xc *The likelihood ratio test for multinomial probabilities*

Description

The likelihood ratio test for multinomial probabilities

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
LR_test_1xc(n, pi0)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
pi0	given probabilities (a 1xc vector)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
LR_test_1xc(n = snp6498169$complete$n, pi0 = snp6498169$complete$pi0)
# subset of 10 patients
LR_test_1xc(n = snp6498169$subset$n, pi0 = snp6498169$subset$pi0)
```

LR_test_2x2 *The likelihood ratio test for association in 2x2 tables*

Description

The likelihood ratio test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
LR_test_2x2(n)
```

Arguments

n	the observed counts (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
LR_test_2x2(tea)
LR_test_2x2(perondi_2004)
LR_test_2x2(lampasona_2013)
LR_test_2x2(ritland_2007)
```

lydersen_2012a *Postoperative nausea*

Description

Postoperative nausea

Usage

```
lydersen_2012a
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 4 columns.

References

Lydersen et al. (2012a)

MantelHaenszel_estimate_stratified_2x2 *The Mantel-Haenszel estimate of the overall effect across strata*

Description

The Mantel-Haenszel estimate of the overall effect across strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
MantelHaenszel_estimate_stratified_2x2(n, link = "logit")
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`link`	the link function ('linear', 'log', or 'logit')

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
MantelHaenszel_estimate_stratified_2x2(doll_hill_1950)
MantelHaenszel_estimate_stratified_2x2(hine_1989)
```

`MantelHaenszel_test_2xc` *The Mantel-Haenszel test of association with column scores*

Description

The Mantel-Haenszel test of association with column scores

Described in Chapter 6 "The Ordered 2xc Table"

Usage

```
MantelHaenszel_test_2xc(n, b = 0)
```

Arguments

`n`	the observed counts (a 2xc matrix)
`b`	scores assigned to the columns (if b=0, midranks will be used as scores)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
MantelHaenszel_test_2xc(lydersen_2012a)
```

`McNemarBowker_test_paired_cxc` *The McNemar-Bowker test for marginal symmetry*

Description

The McNemar-Bowker test for marginal symmetry

Described in Chapter 9 "The Paired cxc Table"

Usage

```
McNemarBowker_test_paired_cxc(n)
```

Arguments

`n`	the observed table (a cxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Pretherapy susceptability of pathogens (Peterson et al., 2007)
McNemarBowker_test_paired_cxc(peterson_2007)
```

`McNemar_asymptotic_test_CC_paired_2x2`
The McNemar asymptotic test with continuity correction

Description

The McNemar asymptotic test with continuity correction

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
McNemar_asymptotic_test_CC_paired_2x2(n)
```

Arguments

`n`	the observed table (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
McNemar_asymptotic_test_CC_paired_2x2(bentur_2009)
McNemar_asymptotic_test_CC_paired_2x2(cavo_2012)
McNemar_asymptotic_test_CC_paired_2x2(ezra_2010)
```

McNemar_asymptotic_test_paired_2x2

The McNemar asymptotic test

Description

The McNemar asymptotic test

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
McNemar_asymptotic_test_paired_2x2(n)
```

Arguments

n	the observed table (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
McNemar_asymptotic_test_paired_2x2(bentur_2009)
McNemar_asymptotic_test_paired_2x2(cavo_2012)
McNemar_asymptotic_test_paired_2x2(ezra_2010)
```

McNemar_exact_cond_test_paired_2x2

The McNemar exact conditional test

Description

The McNemar exact conditional test

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
McNemar_exact_cond_test_paired_2x2(n)
```

Arguments

n	the observed table (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
McNemar_exact_cond_test_paired_2x2(bentur_2009)
McNemar_exact_cond_test_paired_2x2(cavo_2012)
McNemar_exact_cond_test_paired_2x2(ezra_2010)
```

`McNemar_exact_unconditional_test_paired_2x2`

The McNemar exact unconditional test

Description

The McNemar exact unconditional test

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
McNemar_exact_unconditional_test_paired_2x2(
  n,
  gamma = 1e-04,
  num_pi_values = 1000L
)
```

Arguments

`n`	the observed table (a 2x2 matrix)
`gamma`	parameter for the Berger and Boos procedure (default=0.0001; gamma=0: no adj)
`num_pi_values`	number of values to use in the partition of the nuisance parameter space (default=1000)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Note

Somewhat crude code with maximization over a simple partition of the nuisance parameter space into 'num_pi_values' equally spaced values The number may be changed. This method could be improved with a better algorithm for the maximization; however, it works well for most purposes. Try `showplot=1` to get an indication of the precision. A refinement of the maximization can be done with a manual restriction of the parameter space.

Examples

```
McNemar_exact_unconditional_test_paired_2x2(bentur_2009)
McNemar_exact_unconditional_test_paired_2x2(cavo_2012, gamma = 0)
## Not run: McNemar_exact_unconditional_test_paired_2x2(ezra_2010)
```

`McNemar_midP_test_paired_2x2`
The McNemar mid-P test

Description

The McNemar mid-P test

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
McNemar_midP_test_paired_2x2(n)
```

Arguments

`n`	the observed table (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
McNemar_midP_test_paired_2x2(bentur_2009)
McNemar_midP_test_paired_2x2(cavo_2012)
McNemar_midP_test_paired_2x2(ezra_2010)
```

`Mee_asymptotic_score_CI_2x2`
The Mee asymptotic score confidence interval for the difference between probabilities

---

Description

The Mee asymptotic score confidence interval for the difference between probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Mee_asymptotic_score_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004):
Mee_asymptotic_score_CI_2x2(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
Mee_asymptotic_score_CI_2x2(ritland_2007)
```

MidP_binomial_test_1x2

The mid-P binomial test for the binomial probability (pi)

Description

The mid-P binomial test for the binomial probability (pi) H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided) Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
MidP_binomial_test_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# The number of 1st order male births (Singh et al. 2010, adapted)
MidP_binomial_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = .5)
# The number of 2nd order male births (Singh et al. 2010, adapted)
MidP_binomial_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = .5)
# The number of 3rd order male births (Singh et al. 2010, adapted)
MidP_binomial_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = .5)
# The number of 4th order male births (Singh et al. 2010, adapted)
MidP_binomial_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = .5)
# Ligarden et al. (2010, adapted)
MidP_binomial_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = .5)
```

`MidP_multinomial_test_1xc`

The mid-P multinomial test for multinomial probabilities

Description

The mid-P multinomial test for multinomial probabilities

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
MidP_multinomial_test_1xc(n, pi0)
```

Arguments

`n`	the observed counts (a 1xc vector, where c is the number of categories)
`pi0`	given probabilities (a 1xc vector)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
MidP_multinomial_test_1xc(n = snp6498169$complete$n, pi0 = snp6498169$complete$pi0)

# subset of 10 patients
MidP_multinomial_test_1xc(n = snp6498169$subset$n, pi0 = snp6498169$subset$pi0)
```

MiettinenNurminen_asymptotic_score_CI_difference_2x2

The Mietinen-Nurminen asymptotic score confidence interval for the

Description

The Mietinen-Nurminen asymptotic score confidence interval for the

difference between probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
MiettinenNurminen_asymptotic_score_CI_difference_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004):
MiettinenNurminen_asymptotic_score_CI_difference_2x2(perondi_2004)
# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
MiettinenNurminen_asymptotic_score_CI_difference_2x2(ritland_2007)
```

MiettinenNurminen_asymptotic_score_CI_OR_2x2

The Miettinen-Nurminen asymptotic score CI for the odds ratio

Description

The Miettinen-Nurminen asymptotic score confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
MiettinenNurminen_asymptotic_score_CI_OR_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# A case-control study of GADA exposure on IPEX syndrome (Lampasona et al., 2013)
MiettinenNurminen_asymptotic_score_CI_OR_2x2(lampasona_2013)
# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
MiettinenNurminen_asymptotic_score_CI_OR_2x2(ritland_2007)
```

MiettinenNurminen_asymptotic_score_CI_ratio_2x2

The Miettinen-Nurminen asymptotic score confidence interval for the ratio of probabilities

---

Description

The Miettinen-Nurminen asymptotic score confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
MiettinenNurminen_asymptotic_score_CI_ratio_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
n <- perondi_2004
MiettinenNurminen_asymptotic_score_CI_ratio_2x2(n)
# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
n <- ritland_2007
MiettinenNurminen_asymptotic_score_CI_ratio_2x2(n)
```

mills_graubard_1987 *Alcohol consumption and malformations*

Description

Alcohol consumption and malformations

Usage

```
mills_graubard_1987
```

Format

An object of class `matrix` (inherits from `array`) with 5 rows and 2 columns.

References

Mills and Graubard (1987)

ML_estimates_and_CIs_stratified_2x2 *Maximum likelihood estimates with CIs of the grouping and strata effects*

Description

Maximum likelihood estimates with CIs of the grouping and strata effects

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
ML_estimates_and_CIs_stratified_2x2(n, link = "log", alpha = 0.05)
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`link`	the link function ('linear', 'log', or 'logit')
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
ML_estimates_and_CIs_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
ML_estimates_and_CIs_stratified_2x2(hine_1989)
```

`MOVER_R_Wilson_CI_OR_2x2`

The MOVER-R Wilson confidence interval for the odds ratio

Description

The MOVER-R Wilson confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
MOVER_R_Wilson_CI_OR_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# A case-control study of GADA exposure on IPEX syndrome (Lampasona et al., 2013):
MOVER_R_Wilson_CI_OR_2x2(lampasona_2013)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
MOVER_R_Wilson_CI_OR_2x2(ritland_2007)
```

`MOVER_R_Wilson_CI_ratio_2x2`

The MOVER-R Wilson confidence interval for the ratio of probabilities

---

Description

The MOVER-R Wilson confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
MOVER_R_Wilson_CI_ratio_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
MOVER_R_Wilson_CI_ratio_2x2(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
MOVER_R_Wilson_CI_ratio_2x2(ritland_2007)
```

`MOVER_Wilson_score_CI_paired_2x2`

The MOVER Wilson score confidence interval for the ratio of paired probabilities

---

Description

The MOVER Wilson score confidence interval for the ratio of paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
MOVER_Wilson_score_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
MOVER_Wilson_score_CI_paired_2x2(bentur_2009)
MOVER_Wilson_score_CI_paired_2x2(cavo_2012)
```

Newcombe_hybrid_score_CI_2x2

The Newcombe hybrid score confidence interval for the difference between probabilities

---

Description

The Newcombe hybrid score confidence interval for the difference between probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Newcombe_hybrid_score_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
Newcombe_hybrid_score_CI_2x2(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
Newcombe_hybrid_score_CI_2x2(ritland_2007)
```

Newcombe_square_and_add_CI_paired_2x2

The Newcombe square-and-add confidence interval for the difference

Description

The Newcombe square-and-add confidence interval for the difference between paired probabilities.

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Newcombe_square_and_add_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Newcombe_square_and_add_CI_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Newcombe_square_and_add_CI_paired_2x2(cavo_2012)
```

Pearson_chi_squared_test_1xc

The Pearson chi-squared test for multinomial probabilities

Description

The Pearson chi-squared test for multinomial probabilities

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
Pearson_chi_squared_test_1xc(n, pi0)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
pi0	given probabilities (a 1xc vector)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
Pearson_chi_squared_test_1xc(n = snp6498169$complete$n, pi0 = snp6498169$complete$pi0)
# subset of 10 patients
Pearson_chi_squared_test_1xc(n = snp6498169$subset$n, pi0 = snp6498169$subset$pi0)
```

Pearson_chi_squared_test_2x2

The Pearson chi-squared test for association in 2x2 tables

Description

The Pearson chi-squared test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
Pearson_chi_squared_test_2x2(n)
```

Arguments

n	the observed counts (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Example: A lady tasting a cup of tea
Pearson_chi_squared_test_2x2(tea)

# Example: Perondi et al. (2004)
Pearson_chi_squared_test_2x2(perondi_2004)

# Example: Lampasona et al. (2013)
Pearson_chi_squared_test_2x2(lampasona_2013)
```

```
# Example: Ritland et al. (2007)
Pearson_chi_squared_test_2x2(ritland_2007)
```

`Pearson_chi_squared_test_CC_2x2`

The Pearson chi-squared test for association in 2x2 tables

Description

The Pearson chi-squared test for association in 2x2 tables

with continuity correction

Described in Chapter 4 "The 2x2 Table"

Usage

```
Pearson_chi_squared_test_CC_2x2(n)
```

Arguments

`n`	the observed counts (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Example: A lady tasting a cup of tea
Pearson_chi_squared_test_CC_2x2(tea)

# Example: Perondi et al. (2004)
Pearson_chi_squared_test_CC_2x2(perondi_2004)

# Example: Lampasona et al. (2013)
Pearson_chi_squared_test_CC_2x2(lampasona_2013)

# Example: Ritland et al. (2007)
Pearson_chi_squared_test_CC_2x2(ritland_2007)
```

`Pearson_correlation_coefficient_rxc` *The Pearson correlation coefficient*

Description

The Pearson correlation coefficient

Described in Chapter 7 "The rxc Table"

Usage

```
Pearson_correlation_coefficient_rxc(
  n,
  a = seq_len(nrow(n)),
  b = seq_len(ncol(n)),
  alpha = 0.05
)
```

Arguments

`n`	the observed table (an rxc matrix)
`a`	scores assigned to the rows
`b`	scores assigned to the columns
`alpha`	the nominal significance level, used to compute a 100(1-alpha) confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Pearson_correlation_coefficient_rxc(table_7.7)
Pearson_correlation_coefficient_rxc(table_7.8)
Pearson_correlation_coefficient_rxc(table_7.9)
```

`Pearson_correlation_coefficient_rxc_bca` *The Pearson correlation coefficient with the bias-corrected and accelerated*

Description

The Pearson correlation coefficient with the bias-corrected and accelerated

boostrap confidence interval

Described in Chapter 7 "The rxc Table"

Usage

```
Pearson_correlation_coefficient_rxc_bca(
  n,
  nboot = 10000,
  a = seq_len(nrow(n)),
  b = seq_len(ncol(n)),
  alpha = 0.05
)
```

Arguments

`n`	the observed table (an rxc matrix)
`nboot`	number of bootstrap samples
`a`	scores assigned to the rows
`b`	scores assigned to the columns
`alpha`	the nominal significance level, used to compute a 100(1-alpha) confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
set.seed(3509)
Pearson_correlation_coefficient_rxc_bca(table_7.7, nboot = 800)
Pearson_correlation_coefficient_rxc_bca(table_7.8, nboot = 200)
## Not run:
  Pearson_correlation_coefficient_rxc_bca(table_7.9)

## End(Not run)
```

Pearson_LR_homogeneity_test_stratified_2x2

The Pearson chi-squared and likelihood ratio tests for homogeneity over strata

Description

The Pearson chi-squared and likelihood ratio tests for homogeneity over strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Pearson_LR_homogeneity_test_stratified_2x2(n, link = "logit")
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)
link	the link function ('linear', 'log', or 'logit')

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Pearson_LR_homogeneity_test_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Pearson_LR_homogeneity_test_stratified_2x2(hine_1989)
```

Pearson_LR_tests_cum_OR_2xc

The Pearson chi-squared and likelihood ratio tests for cumulative ORs in 2xc tables

Description

The Pearson chi-squared and likelihood ratio tests for cumulative ORs in 2xc tables

Described in Chapter 6 "The Ordered 2xc Table"

Usage

```
Pearson_LR_tests_cum_OR_2xc(n, direction = "decreasing")
```

Arguments

n	the observed counts (a 2xc matrix)
direction	the direction of column probabilities ("increasing" or "decreasing")

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Postoperative nausea (Lydersen et al., 2012a)
Pearson_LR_tests_cum_OR_2xc(lydersen_2012a)
```

Pearson_LR_tests_rxc *The Pearson chi-squared and likelihood ratio tests for association in rxc tables*

Description

The Pearson chi-squared and likelihood ratio tests for association in rxc tables

Described in Chapter 7 "The rxc Table"

Usage

```
Pearson_LR_tests_rxc(n)
```

Arguments

n	the observed counts (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Examples from Chapter 5 (ordered rx2 tables)

## Alcohol consumption and malformations (Mills and Graubard, 1987):
Pearson_LR_tests_rxc(mills_graubard_1987)

## Elevated troponin T levels in stroke patients (Indredavik et al., 2008):
Pearson_LR_tests_rxc(indredavik_2008)

# Examples from Chapter 6 (ordered 2xc tables)
## The Adolescent Placement Study (Fontanella et al., 2008):
```

```
Pearson_LR_tests_rxc(fontanella_2008)

## Postoperative nausea (Lydersen et al., 2012a):
Pearson_LR_tests_rxc(lydersen_2012a)

# Examples from Chapter 7 (unordered rxc tables)

## Treatment for ear infection (van Balen et al., 2003):
Pearson_LR_tests_rxc(table_7.3)

## Psychiatric diagnoses vs PA (Mangerud et al., 2004):
Pearson_LR_tests_rxc(table_7.4)

## Psychiatric diag. vs BMI (Mangerud et al., 2004):
Pearson_LR_tests_rxc(table_7.5)
```

`Pearson_LR_tests_unspecific_ordering_rx2` *The Pearson chi-squared and likelihood ratio tests for unspecific ordering in rx2 tables*

Description

The Pearson chi-squared and likelihood ratio tests for unspecific ordering in rx2 tables. Described in Chapter 5 "The Ordered rx2 Table". May also be used for 2xc tables, after flipping rows and columns (i.e. if n is a 2xc table, call this function with n' (the transpose of n) as the first argument).

Usage

```
Pearson_LR_tests_unspecific_ordering_rx2(n, direction)
```

Arguments

`n`	the observed counts (an rx2 matrix)
`direction`	the direction of the success probabilities ("increasing" or "decreasing")

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Chapter 5: Alcohol consumption and malformations (Mills and Graubard, 1987)
Pearson_LR_tests_unspecific_ordering_rx2(mills_graubard_1987, "increasing")

# Chapter 5: Elevated troponin T levels in stroke patients (Indredavik et al., 2008)
Pearson_LR_tests_unspecific_ordering_rx2(indredavik_2008, "decreasing")
```

```
# Chapter 6: Postoperative nausea (Lydersen et al., 2012a)
Pearson_LR_tests_unspecific_ordering_rx2(t(lydersen_2012a), "decreasing")
```

`Pearson_LR_test_common_effect_stratified_2x2` *The Pearson chi-squared and likelihood ratio tests of a common difference*

Description

The Pearson chi-squared and likelihood ratio tests of a common difference

between probabilities (link = 'linear'), ratio of probabilities (link =

'log'), or odds ratio (link = 'logit')

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Pearson_LR_test_common_effect_stratified_2x2(n, link = "logit")
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`link`	the link function ('linear', 'log', or 'logit')

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Pearson_LR_test_common_effect_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Pearson_LR_test_common_effect_stratified_2x2(hine_1989)
```

Pearson_residuals_rxc *The Pearson residuals and the standardized Pearson residuals*

Description

The Pearson residuals and the standardized Pearson residuals

Described in Chapter 7 "The rxc Table"

Usage

```
Pearson_residuals_rxc(n)
```

Arguments

n	the observed counts (an rxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
## Treatment for ear infection (van Balen et al., 2003):
Pearson_residuals_rxc(table_7.3)

## Psychiatric diagnoses vs PA (Mangerud et al., 2004):
Pearson_residuals_rxc(table_7.4)

## Psychiatric diag. vs BMI (Mangerud et al., 2004):
Pearson_residuals_rxc(table_7.5)
```

perondi_2004 *An RCT of high vs standard dose of epinephrine*

Description

An RCT of high vs standard dose of epinephrine

Usage

```
perondi_2004
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Perondi et al. (2004)

`peterson_2007` *Pretherapy susceptability of pathogens*

Description

Pretherapy susceptability of pathogens

Usage

```
peterson_2007
```

Format

An object of class `matrix` (inherits from `array`) with 4 rows and 4 columns.

References

Peterson et al. (2007)

`Peto_homogeneity_test_stratified_2x2`
The Peto test for homogeneity of odds ratios over strata

Description

The Peto test for homogeneity of odds ratios over strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Peto_homogeneity_test_stratified_2x2(n)
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Peto_homogeneity_test_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Peto_homogeneity_test_stratified_2x2(hine_1989)
```

Peto_OR_estimate_stratified_2x2

The Peto estimate of the common odds ratio across strata

Description

The Peto estimate of the common odds ratio across strata

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Peto_OR_estimate_stratified_2x2(n)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Peto_OR_estimate_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Peto_OR_estimate_stratified_2x2(hine_1989)
```

PriceBonett_approximate_Bayes_CI_2x2

The Price-Bonett approximate Bayes confidence interval for the ratio of probabilities

Description

The Price-Bonett approximate Bayes confidence interval for the ratio of probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
PriceBonett_approximate_Bayes_CI_2x2(n, a = 1.25, b = 2.5, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
a, b	parameters of the beta distribution
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
PriceBonett_approximate_Bayes_CI_2x2(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
PriceBonett_approximate_Bayes_CI_2x2(ritland_2007)
```

---

print.contingencytables_result

Output from a contingency tables method

Description

Output from a contingency tables method

Usage

```
## S3 method for class 'contingencytables_result'
print(x, as_list = FALSE, ...)
```

Arguments

x	The output from a function from the contingencytables package
as_list	Print the elements of x as a list
...	unused (kept for consistency with the generic base::print())

QuesenberryHurst_Wilson_score_CIs_1xc

The Quesenberry-Hurst Wilson score simultaneous intervals for the multinomial probabilities

Description

The Quesenberry-Hurst Wilson score simultaneous intervals for the multinomial probabilities

(with Scheffe adjustment)

Described in Chapter 3 "The 1xc Table and the Multinomial Distribution"

Usage

```
QuesenberryHurst_Wilson_score_CIs_1xc(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
QuesenberryHurst_Wilson_score_CIs_1xc(n = snp6498169$complete$n)
```

RBG_test_and_CI_stratified_2x2

The RBG test and CI for a common odds ratio

Description

The RBG test and CI for a common odds ratio

(A Wald-type test and CI based on the Mantel-Haenszel estimate)

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
RBG_test_and_CI_stratified_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
RBG_test_and_CI_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
RBG_test_and_CI_stratified_2x2(hine_1989)
```

---

ritland_2007 *The association between CHRNA4 genotype and XFS*

Description

The association between CHRNA4 genotype and XFS

Usage

```
ritland_2007
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

References

Ritland et al. (2007)

Scheffe_type_CIs_paired_cxc *ScheffE-type confidence intervals for differences of marginal probabilities*

Description

ScheffE-type confidence intervals for differences of marginal probabilities

Described in Chapter 9 "The Paired kxk Table"

Usage

```
Scheffe_type_CIs_paired_cxc(n, alpha = 0.05)
```

Arguments

n	the observed table (a cxc matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Pretherapy susceptability of pathogens (Peterson et al., 2007)
Scheffe_type_CIs_paired_cxc(peterson_2007)
```

Scheffe_type_CIs_rxc *The ScheffE-type simultaneous confidence intervals for the differences pi_1|i - pi_1|j*

Description

The ScheffE-type simultaneous confidence intervals for the differences pi_1|i - pi_1|j

Described in Chapter 7 "The rxc Table"

Usage

```
Scheffe_type_CIs_rxc(n, alpha = 0.05)
```

Arguments

n	the observed counts (an rx2 vector)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Example: Treatment for ear infection
Scheffe_type_CIs_rxc(table_7.3)
```

`Score_test_1x2` *The score test for the binomial probability (pi)*

Description

The score test for the binomial probability (pi) H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided) Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Score_test_1x2(X, n, pi0)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`pi0`	a given probability

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# The number of 1st order male births (Singh et al. 2010, adapted)
Score_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = .5)
# The number of 2nd order male births (Singh et al. 2010, adapted)
Score_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = .5)
# The number of 3rd order male births (Singh et al. 2010, adapted)
Score_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = .5)
# The number of 4th order male births (Singh et al. 2010, adapted)
Score_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = .5)
# Ligarden et al. (2010, adapted)
Score_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = .5)
```

Score_test_and_CI_marginal_mean_scores_paired_cxc *Score test and CI marginal mean scores paired CxC*

Description

The score test and confidence interval for the difference between marginal mean scores Described in Chapter 9 "The Paired cxc Table"

Usage

```
Score_test_and_CI_marginal_mean_scores_paired_cxc(
  n,
  a = seq_len(nrow(n)),
  alpha = 0.05
)
```

Arguments

n	the observed table (a cxc matrix)
a	scores assigned to the outcome categories
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# A comparison between serial and retrospective measurements
# (Fischer et al., 1999)
a <- c(8, 3.5, 0, -3.5, -8)
Score_test_and_CI_marginal_mean_scores_paired_cxc(fischer_1999, a)
```

Score_test_CC_1x2 *The score test with continuity correction for the*

Description

The score test with continuity correction for the binomial probability (pi). H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided). Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Score_test_CC_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# The number of 1st order male births (Singh et al. 2010, adapted)
Score_test_CC_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = .5)
# The number of 2nd order male births (Singh et al. 2010, adapted)
Score_test_CC_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = .5)
# The number of 3rd order male births (Singh et al. 2010, adapted)
Score_test_CC_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = .5)
# The number of 4th order male births (Singh et al. 2010, adapted)
Score_test_CC_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = .5)
# Ligarden et al. (2010, adapted)
Score_test_CC_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = .5)
```

Score_test_for_effect_in_the_probit_model_2xc

Score test for effect in the cumulative probit model

Description

The score test for effect in the cumulative probit model described in Chapter 6 "The Ordered 2xc Table"

Usage

```
Score_test_for_effect_in_the_probit_model_2xc(n, alphahat0)
```

Arguments

n	the observed counts (a 2xc matrix)
alphahat0	a column vector with c-1 estimated coefficients (alpha_j) under the null hypothesis (beta = 0)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Note

Must give the alphahats under the null hypothesis as input, because Matlab does not calculate an intercept-only probit model (and this may apply to R code as well). alphahat0 can be calculated in, for instance, Stata.

Examples

```
# The Adolescent Placement Study (Fontanella et al., 2008)
alphahat0 <- c(-1.246452, -0.5097363, 0.2087471)
Score_test_for_effect_in_the_probit_model_2xc(fontanella_2008, alphahat0)

# Postoperative nausea (Lydersen et al., 2012a)
alphahat0 <- c(-0.1923633, 0.5588396, 1.271953)
Score_test_for_effect_in_the_probit_model_2xc(lydersen_2012a, alphahat0)
```

---

singh_2010_1 *The number of n-th order male births*

Description

The number of n-th order male births

Usage

```
singh_2010
```

Format

An object of class `data.frame` with 4 rows and 2 columns.

References

Singh et al. (2010)

---

snp6498169 *Genotype counts for SNP rs 6498169 in RA patients*

Description

Genotype counts for SNP rs 6498169 in RA patients

Usage

```
snp6498169
```

Format

An object of class `list` of length 2.

`Spearman_correlation_coefficient_rxc`
The Spearman correlation coefficient

Description

The Spearman correlation coefficient

Described in Chapter 7 "The rxc Table"

Usage

```
Spearman_correlation_coefficient_rxc(n, alpha = 0.05)
```

Arguments

`n`	the observed table (an rxc matrix)
`alpha`	the nominal significance level, used to compute a 100(1-alpha)# confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Spearman_correlation_coefficient_rxc(table_7.7)
Spearman_correlation_coefficient_rxc(table_7.8)
Spearman_correlation_coefficient_rxc(table_7.9)
```

`Spearman_correlation_coefficient_rxc_bca`
The Spearman correlation coefficient with the bias-corrected and accelerated

---

Description

The Spearman correlation coefficient with the bias-corrected and accelerated

boostrap confidence interval

Described in Chapter 7 "The rxc Table"

Usage

```
Spearman_correlation_coefficient_rxc_bca(n, nboot = 10000, alpha = 0.05)
```

Arguments

n	the observed table (an rxc matrix)
nboot	number of bootstrap samples
alpha	the nominal significance level, used to compute a 100(1-alpha) confidence interval

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
set.seed(2921)
Spearman_correlation_coefficient_rxc_bca(table_7.7, nboot = 800)
Spearman_correlation_coefficient_rxc_bca(table_7.8, nboot = 200)
## Not run:
  Spearman_correlation_coefficient_rxc_bca(table_7.9)

## End(Not run)
```

`stratified_2x2_tables` *Stratified 2x2 tables*

Description

Stratified 2x2 tables

Usage

```
stratified_2x2_tables(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

NULL. This function should be called for its printed output

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
stratified_2x2_tables(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
stratified_2x2_tables(hine_1989)
```

Stuart_test_paired_cxc *The Stuart test for marginal homogeneity*

Description

The Stuart test for marginal homogeneity

Described in Chapter 9 "The Paired cxc Table"

Usage

```
Stuart_test_paired_cxc(n)
```

Arguments

n	the observed table (a cxc matrix)

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Pretherapy susceptability of pathogens (Peterson et al., 2007)
Stuart_test_paired_cxc(peterson_2007)
```

table_7.3 *Treatment for ear infection*

Description

Status after 21 days treatment of the ear infection acute otitis externa (Van Balen et al., 2003).

Van Balen et al. (2003) report a randomized, double-blind, controlled trial comparing three treatments for an ear infection. The numbers and proportions of patients reported cured and not cured after 21 days of treatment are summarized in Table 7.3. Because there is no ordering between the treatments, we regard Table 7.3 as an unordered 3×2 table.

Usage

```
table_7.3
vanbalen_2003
```

Format

An object of class `matrix` (inherits from `array`) with 3 rows and 2 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Van Balen et al. (2003)

`table_7.4` *Psychiatric Diagnoses and Physical Activity*

Description

Psychiatric diagnoses and participation in team sports (Mangerud et al., 2014)

Table 7.4 shows the number of subjects participating in team sports within each of six psychiatric diagnoses, based on data from a study of physical activity in adolescents aged 13 to 18 years who were referred to a child and adolescent psychiatric clinic from 2009 to 2001 (Mangerud et al., 2014). The psychiatric diagnoses are unordered, and we shall treat this as an unordered 6 x 2 table

Usage

```
table_7.4
mangerud_2014_PA
```

Format

An object of class `matrix` (inherits from `array`) with 6 rows and 2 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

`table_7.5` *Psychiatric diag. vs BMI with hyperkinetic disorders as reference category*

Description

Psychiatric diagnoses and weight categories based on age- and sex-adjusted BMI (Mangerud et al., 2014).

Table 7.5 shows the number of thin, normal weight, and overweight subjects within each of six psychiatric diagnoses, based on the same study as in Section 7.2.2 (Mangerud et al., 2014). Body mass index (BMI) is calculated as the weight in kg divided by the squared height in meters. In subjects aged 18 years or older, the cut-off points for being categorized as thin, normal weight, and overweight are BMI less than 18.5, BMI between 18.5 and 25, and BMI above 25, respectively. For younger subjects (below 18 years of age), the categorization was done following internationally adopted cut-off points for age and sex (Cole et al., 2000, 2007). For example, the cut-off point for being overweight at age 13 is 21.91 for males and 22.58 for females.

Usage

```
table_7.5
mangerud_2014_BMI
```

Format

An object of class `matrix` (inherits from `array`) with 6 rows and 3 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Mangerud et al. (2014)

`table_7.6` *Low Birth Weight vs psychiatric morbitidy with control as reference category*

Description

Categories of birth weight and psychiatric problems at age 20 years (Lund et al., 2012).

Lund et al. (2012) report psychiatric morbidity in young adulthood in two low birth weight groups and a control group. The subjects were born between 1986 and 1988. The very low birth weight (VLBW) group consisted of babies born preterm with birth weight up to 1500 grams. The small for gestational age at term (SGA) group was born at term with birth weight below the 10th percentile adjusted for gestational age, sex, and parity. The control group was born at term, and was not small for gestational age. Table 7.6 shows the severity level of psychiatric problems at age 20 years. We shall regard the birth groups as unordered; however, the diagnostic groups are naturally ordered. Hence, Table 7.6 is a singly ordered 3×3 table with unordered rows and ordered columns.

Usage

```
table_7.6
lund_2012
```

Format

An object of class `matrix` (inherits from `array`) with 3 rows and 3 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Lund et al. (2012)

table_7.7 *Colorectal cancer (Table 7.7)*

Description

Duration of symptoms and tumor stage for patients treated for colorectal cancer (Jullumstroe et al., 2009).

Early detection and treatment of colorectal cancer is beneficial, because advanced stages of colorectal cancer have poorer prognosis. Table 7.7 displays duration of symptoms (rows) versus tumor stage (columns) in a study of 784 patients treated for colorectal cancer at a regional hospital in Norway from 1980 to 2004 (Jullumstroe et al., 2009). The rows as well as the columns are ordered, and Table 7.7 can be regarded as a doubly ordered 4×4 table.

Usage

```
table_7.7
jullumstroe_2009
```

Format

An object of class `matrix` (inherits from `array`) with 4 rows and 4 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Jullumstroe et al. (2009)

table_7.8 *Breast Tumor*

Description

Nuclear pleomorphism from fine needle aspiration smears and breast tumor type (Bofin et al., 2004).

Bofin et al. (2004) studied associations between different findings in fine needle aspiration (FNA) smears from breast tumors and the final histological diagnosis of tumor type in 133 patients. The aim of the study was to identify variables developed from FNA smears that could differentiate between the different tumor diagnoses. Table 7.8 presents the cross-classification of the FNA variable nuclear pleomorphism with tumor types. Both variables can be considered as ordered, with tumor type ordered from benign (as in NPBD) to most malign (as in IDC).

Usage

```
table_7.8
bofin_2004
```

Format

An object of class `matrix` (inherits from `array`) with 3 rows and 5 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Bofin et al. (2004)

`table_7.9` *Self-rated health (Table 7.9)*

Description

Self-rated health for 12 to 17 years old adolescents in Young-HUNT 1 and four years later in Young-HUNT 2 (Breidablik et al., 2008).

In the HUNT study (Nord-Trøndelag county health survey), one of the questions is: "How is your overall health at the moment?" The outcome categories are "Very good", "Good", "Not very good", and "Poor". Table 7.9 shows the counts for the adolescents aged 12 to 17 years in 1995 to 1997 (Young-HUNT 1), and for the same individuals four years later (Young-HUNT 2; Breidablik et al. (2008)). Both the rows and the columns are ordered. In this example, it may be appropriate to regard self-rated health as an unobserved (latent) continuous variable, where only a categorized version has been observed. Table 7.9 is actually an example of a paired c × c table with ordinal data.

Usage

```
table_7.9
breidablik_2008
```

Format

An object of class `matrix` (inherits from `array`) with 4 rows and 4 columns.

References

Fagerland MW, Lydersen S, Laake P (2017)

Breidablik et al. (2008)

Tango_asymptotic_score_CI_paired_2x2

The Tango asymptotic score confidence interval for the difference between paired probabilities

Description

The Tango asymptotic score confidence interval for the difference between paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Tango_asymptotic_score_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Tango_asymptotic_score_CI_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Tango_asymptotic_score_CI_paired_2x2(cavo_2012)
```

Tang_asymptotic_score_CI_paired_2x2

The Tang asymptotic score confidence interval for the ratio of paired probabilities

Description

The Tang asymptotic score confidence interval for the ratio of paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Tang_asymptotic_score_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Tang_asymptotic_score_CI_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Tang_asymptotic_score_CI_paired_2x2(cavo_2012)
```

---

tea *A lady tasting a cup of tea*

Description

A lady tasting a cup of tea

Usage

```
tea
```

Format

An object of class `matrix` (inherits from `array`) with 2 rows and 2 columns.

the_1x2_table_CIs *The 1x2 Table CIs*

Description

The 1x2 Table CIs

Usage

```
the_1x2_table_CIs(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

NULL. This function should be called for its printed output

Examples

```
# The number of 1st order male births (Singh et al. 2010)
the_1x2_table_CIs(singh_2010["1st", "X"], singh_2010["1st", "n"])
# The number of 2nd order male births (Singh et al. 2010)
the_1x2_table_CIs(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
# The number of 3rd order male births (Singh et al. 2010)
the_1x2_table_CIs(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
# The number of 4th order male births (Singh et al. 2010)
with(singh_2010["4th", ], the_1x2_table_CIs(X, n)) # alternative syntax
# Ligarden et al. (2010)
the_1x2_table_CIs(ligarden_2010["X"], ligarden_2010["n"])
```

the_1x2_table_tests *The 1x2 Table tests*

Description

The 1x2 Table tests

Usage

```
the_1x2_table_tests(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

NULL. This function should be called for its printed output

Examples

```
# Example: The number of 1st order male births (Singh et al. 2010)
the_1x2_table_tests(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.513)
# Example: The number of 2nd order male births (Singh et al. 2010)
the_1x2_table_tests(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.513)
# Example: The number of 3rd order male births (Singh et al. 2010)
the_1x2_table_tests(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.513)
# Example: The number of 4th order male births (Singh et al. 2010)
the_1x2_table_tests(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.513)
# Example: Ligarden et al. (2010)
the_1x2_table_tests(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.5)
```

---

the_1xc_table_CIs *The 1xc table CIs*

Description

The 1xc table CIs

Usage

```
the_1xc_table_CIs(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

NULL. This function should be called for its printed output

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
the_1xc_table_CIs(n = snp6498169$complete$n)
```

the_1xc_table_tests *The 1xc table tests*

Description

The 1xc table tests

Usage

```
the_1xc_table_tests(n, pi0, chacko.test = FALSE)
```

Arguments

n	the observed counts (a 1xc vector, where c is the number of categories)
pi0	given probabilities (a 1xc vector)
chacko.test	if TRUE, only performs the Chacko test

Value

NULL. This function should be called for its printed output

Examples

```
# Genotype counts for SNP rs 6498169 in RA patients
the_1xc_table_tests(n = snp6498169$complete$n, pi0 = snp6498169$complete$pi0)
# subset of 10 patients
the_1xc_table_tests(n = snp6498169$subset$n, pi0 = snp6498169$subset$pi0)
# Example for the Chacko test: Hypothetical experiment
the_1xc_table_tests(n = hypothetical, pi0 = c(0.402, 0.479, 0.119), TRUE)
```

the_2x2_table_CIs_difference *The 2x2 table CIs difference*

Description

Wrapper for _CI_2x2 functions on Chapter 4.

Usage

```
the_2x2_table_CIs_difference(n, alpha = 0.05)
```

Arguments

n	frequency matrix
alpha	type I error

Value

NULL. This function should be called for its printed output

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
the_2x2_table_CIs_difference(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
the_2x2_table_CIs_difference(ritland_2007)
```

---

the_2x2_table_CIs_OR *The 2x2 table CIs odds ratio*

Description

Wrapper for _CI_OR_2x2 functions on Chapter 4.

Usage

```
the_2x2_table_CIs_OR(n, alpha = 0.05)
```

Arguments

n	frequency matrix
alpha	type I error

Value

NULL. This function should be called for its printed output

Examples

```
# Example: A lady tasting a cup of tea
the_2x2_table_CIs_OR(tea)

# Example: Perondi et al. (2004)
the_2x2_table_CIs_OR(perondi_2004)

# Example: Lampasona et al. (2013)
the_2x2_table_CIs_OR(lampasona_2013)

# Example: Ritland et al. (2007)
the_2x2_table_CIs_OR(ritland_2007)
```

the_2x2_table_CIs_ratio *The 2x2 table CIs ratio*

Description

Wrapper for _CI_2x2 functions on Chapter 4.

Usage

```
the_2x2_table_CIs_ratio(n, alpha = 0.05)
```

Arguments

n	frequency matrix
alpha	type I error

Value

NULL. This function should be called for its printed output

See Also

the_2x2_table_CIs_difference the_2x2_table_CIs_OR the_2x2_table_tests

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
the_2x2_table_CIs_ratio(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
the_2x2_table_CIs_ratio(ritland_2007)
```

the_2x2_table_tests *The 2x2 table tests*

Description

Wrapper for _test_2x2 functions on Chapter 4.

Usage

```
the_2x2_table_tests(n, gamma = 1e-04)
```

Arguments

n	frequency matrix
gamma	parameter for the Berger and Boos procedure

Value

NULL. This function should be called for its printed output

Examples

```
# Example: A lady tasting a cup of tea
the_2x2_table_tests(tea)

# Example: Perondi et al. (2004)
the_2x2_table_tests(perondi_2004)

# Example: Lampasona et al. (2013)
the_2x2_table_tests(lampasona_2013)

# Example: Ritland et al. (2007)
the_2x2_table_tests(ritland_2007)
```

---

the_2xc_table *The 2xc table*

Description

The 2xc table

Usage

```
the_2xc_table(n, alpha = 0.05, direction = "increasing")
```

Arguments

n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs
direction	the direction of the success probabilities

Value

NULL. This function should be called for its printed output.

Examples

```
## Not run:
# The Adolescent Placement Study (Fontanella et al., 2008)
the_2xc_table(fontanella_2008)

# Postoperative nausea (Lydersen et al., 2012a)
the_2xc_table(lydersen_2012a, direction = "decreasing")

## End(Not run)
```

`the_paired_2x2_table_CIs_difference`
The Paired 2x2 table CIs difference

Description

The Paired 2x2 table CIs difference

Usage

```
the_paired_2x2_table_CIs_difference(n, alpha = 0.05)
```

Arguments

`n`	frequency matrix
`alpha`	type I error

Value

NULL. This function should be called for its printed output.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
the_paired_2x2_table_CIs_difference(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
the_paired_2x2_table_CIs_difference(cavo_2012)
```

`the_paired_2x2_table_CIs_OR`

The Paired 2x2 table CIs OR

Description

The Paired 2x2 table CIs OR

Usage

```
the_paired_2x2_table_CIs_OR(n, alpha = 0.05)
```

Arguments

`n`	frequency matrix
`alpha`	type I error

Value

NULL. This function should be called for its printed output.

Examples

```
the_paired_2x2_table_CIs_OR(ezra_2010)
```

`the_paired_2x2_table_CIs_ratio`

The Paired 2x2 table CIs ratio

Description

The Paired 2x2 table CIs ratio

Usage

```
the_paired_2x2_table_CIs_ratio(n, alpha = 0.05)
```

Arguments

`n`	frequency matrix
`alpha`	type I error

Value

NULL. This function should be called for its printed output.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
the_paired_2x2_table_CIs_ratio(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
the_paired_2x2_table_CIs_ratio(cavo_2012)
```

---

the_paired_2x2_table_tests

The Paired 2x2 table tests

Description

The Paired 2x2 table tests

Usage

```
the_paired_2x2_table_tests(n, gamma = 1e-04, num_pi_values = 1000L)
```

Arguments

n	frequency matrix
gamma	parameter for the Berger and Boos procedure
num_pi_values	number of values to use in the partition of the nuisance parameter space (default=1000)

Value

NULL. This function should be called for its printed output.

Examples

```
the_paired_2x2_table_tests(bentur_2009)
the_paired_2x2_table_tests(cavo_2012, gamma = 0, num_pi_values = 10)
the_paired_2x2_table_tests(ezra_2010, gamma = 0, num_pi_values = 20)
```

the_paired_cxc_table_nominal

The Paired CxC table - nominal

Description

The Paired CxC table - nominal

Usage

```
the_paired_cxc_table_nominal(n, alpha = 0.05)
```

Arguments

n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

NULL. This function should be called for its printed output.

Examples

```
# Pretherapy susceptability of pathogens (Peterson et al., 2007)
the_paired_cxc_table_nominal(peterson_2007)
```

the_paired_cxc_table_ordinal

The Paired CxC table - ordinal

Description

The Paired CxC table - ordinal

Usage

```
the_paired_cxc_table_ordinal(n, a = seq_len(nrow(n)), alpha = 0.05)
```

Arguments

n	the total number of observations
a	scores assigned to the outcome categories
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

NULL. This function should be called for its printed output.

Examples

```
the_paired_cxc_table_ordinal(fischer_1999, c(8, 3.5, 0, -3.5, -8))
```

`the_rx2_table` *The rx2 table*

Description

The rx2 table

Usage

```
the_rx2_table(n, alpha = 0.05, direction = "increasing", skip_exact = FALSE)
```

Arguments

`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95% CIs
`direction`	the direction of the success probabilities
`skip_exact`	If `FALSE`, skips the exact conditional and mid-P tests for unspecific ordering (often saves calculation time) ("increasing" or "decreasing")

Value

NULL. This function should be called for its printed output.

Examples

```
the_rx2_table(mills_graubard_1987, skip_exact = TRUE)
the_rx2_table(indredavik_2008, direction = "decreasing", skip_exact = TRUE)
```

`the_rxc_table` *The rxc table*

Description

The rxc table

Usage

```
the_rxc_table(n, alpha = 0.05, nboot = 10000)
```

Arguments

`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95% CIs
`nboot`	number of boostrap samples. If 0, skips tests that use bootstrapping

Value

NULL. This function should be called for its printed output.

Examples

```
set.seed(8047)
# Unordered tables

## Treatment for ear infection (van Balen et al., 2003)
the_rxc_table(table_7.3, nboot = 200)

## Psychiatric diagnoses vs PA (Mangerud et al., 2004)
the_rxc_table(table_7.4, nboot = 0)

# Singly ordered tables

## Psychiatric diag. vs BMI (Mangerud et al., 2004)
the_rxc_table(table_7.5, nboot = 0)

## Low birth weight vs psychiatric morbitidy (Lund et al., 2012)
the_rxc_table(table_7.6, nboot = 150)

# Doubly ordered tables

## Colorectal cancer (Jullumstroe et al., 2009)
the_rxc_table(table_7.7, nboot = 0)

## Breast Tumor (Bofin et al., 2004)
the_rxc_table(table_7.8, nboot = 200)

## Self-rated health (Breidablik et al., 2008)
the_rxc_table(table_7.9, nboot = 0)
```

Transformed_Blaker_exact_CI_paired_2x2

The Transformed Blaker exact confidence interval for the conditional odds ratio

Description

The Transformed Blaker exact confidence interval for the conditional odds ratio

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Transformed_Blaker_exact_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Transformed_Blaker_exact_CI_paired_2x2(ezra_2010)
```

Transformed_Clopper_Pearson_exact_CI_paired_2x2

The Transformed Clopper-Pearson exact confidence interval for the conditional odds ratio

Description

The Transformed Clopper-Pearson exact confidence interval for the conditional odds ratio

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Transformed_Clopper_Pearson_exact_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Transformed_Clopper_Pearson_exact_CI_paired_2x2(ezra_2010)
```

`Transformed_Clopper_Pearson_midP_CI_paired_2x2`
The Transformed Clopper-Pearson mid-P confidence interval for the conditional odds ratio

---

Description

The Transformed Clopper-Pearson mid-P confidence interval for the conditional odds ratio

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Transformed_Clopper_Pearson_midP_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Transformed_Clopper_Pearson_midP_CI_paired_2x2(ezra_2010)
```

Transformed_Wilson_score_CI_paired_2x2

The Transformed Wilson score confidence interval for the conditional odds ratio

Description

The Transformed Wilson score confidence interval for the conditional odds ratio

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Transformed_Wilson_score_CI_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Transformed_Wilson_score_CI_paired_2x2(ezra_2010)
```

Trend_estimate_CI_tests_rx2

Trend estimate for linear and logit models

Description

Trend estimate for linear and logit models

- The Wald test and CI
- Likelihood ratio test
- The Pearson goodness-of-fit test
- Likelihood ratio (deviance) goodness-of-fit test

Described in Chapter 5 "The Ordered rx2 Table"

Usage

```
Trend_estimate_CI_tests_rx2(
  n,
  a = seq_len(nrow(n)),
  linkfunction = "logit",
  alpha = 0.05
)
```

Arguments

n	the observed counts (an rx2 matrix)
a	scores assigned to the rows
linkfunction	Link function for the binomial distribution see ?family for more details
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Alcohol consumption and malformations (Mills and Graubard, 1987)
Trend_estimate_CI_tests_rx2(mills_graubard_1987, 1:5)

# levated troponin T levels in stroke patients (Indredavik et al., 2008)
Trend_estimate_CI_tests_rx2(indredavik_2008, 1:5)
```

Uncorrected_asymptotic_score_CI_2x2

The uncorrected asymptotic score confidence interval for the odds ratio

---

Description

The uncorrected asymptotic score confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Uncorrected_asymptotic_score_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# A case-control study of GADA exposure on IPEX syndrome
# (Lampasona et al., 2013):
Uncorrected_asymptotic_score_CI_2x2(lampasona_2013)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
Uncorrected_asymptotic_score_CI_2x2(ritland_2007)
```

---

validateArguments *Validate arguments of a function*

Description

This is an internal function used by user-level functions to validate their arguments.

Usage

```
validateArguments(x, types = "default")
```

Arguments

x	named list containing function arguments and their values
types	named vector of types for x

Details

Accepted validation types are:

- "counts"
- "positive"
- "probability"
- "linear, log or logit"
- "MH or IV"
- "logit or probit"
- "increasing or decreasing"
- A vector of possible values

Value

Nothing if all aguments fit their type. An error message otherwise.

Note

Types are evaluated alphabetically, and errors accuse no more than one invalid argument at a time.

Author(s)

Waldir Leoncio

Examples

```
Adjusted_inv_sinh_CI_OR_2x2(ritland_2007)
## Not run: Adjusted_inv_sinh_CI_OR_2x2(-ritland_2007)
```

`Wald_CI_1x2` *The Wald confidence interval for the binomial probability*

Description

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Wald_CI_1x2(X, n, alpha = 0.05)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Wald_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
Wald_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
Wald_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
with(singh_2010["4th", ], Wald_CI_1x2(X, n)) # alternative syntax
Wald_CI_1x2(ligarden_2010["X"], ligarden_2010["n"]) # Ligarden et al. (2010)
```

`Wald_CI_2x2` *The Wald confidence interval for the difference between probabilities*

Description

The Wald confidence interval for the difference between probabilities

Described in Chapter 4 "The 2x2 Table"

Usage

```
Wald_CI_2x2(n, alpha = 0.05)
```

Arguments

`n`	the observed counts (a 2x2 matrix)
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004):
Wald_CI_2x2(n = perondi_2004)
# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
Wald_CI_2x2(n = ritland_2007)
```

`Wald_CI_AgrestiMin_paired_2x2` *The Wald confidence interval for the difference between paired probabilities*

Description

The Wald confidence interval for the difference between paired probabilities

with the pseudo-frequency adjustment suggested by Agresti and Min (2005)

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_AgrestiMin_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Wald_CI_AgrestiMin_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Wald_CI_AgrestiMin_paired_2x2(cavo_2012)
```

Wald_CI_BonettPrice_paired_2x2

The Wald confidence interval for the difference between paired probabilities

---

Description

The Wald confidence interval for the difference between paired probabilities

with the pseudo-frequency adjustment suggested by Bonett and Price(2012)

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_BonettPrice_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Wald_CI_BonettPrice_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Wald_CI_BonettPrice_paired_2x2(cavo_2012)
```

Wald_CI_CC_1x2 *The Wald CI with CC for the binomial probability*

Description

The Wald confidence interval with continuity correction for the binomial probability. Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Wald_CI_CC_1x2(X, n, alpha = 0.05)
```

Arguments

X	the number of successes
n	the total number of observations
alpha	the nominal level, e.g. 0.05 for 95# CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# The number of 1st order male births (Singh et al. 2010)
Wald_CI_CC_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
# The number of 2nd order male births (Singh et al. 2010)
Wald_CI_CC_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
# The number of 3rd order male births (Singh et al. 2010)
Wald_CI_CC_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
# The number of 4th order male births (Singh et al. 2010)
with(singh_2010["4th", ], Wald_CI_CC_1x2(X, n)) # alternative syntax
# Ligarden et al. (2010)
Wald_CI_CC_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

Wald_CI_CC_2x2 *The Wald confidence interval for the difference between probabilities*

Description

The Wald confidence interval for the difference between probabilities with Yates's continuity correction. Described in Chapter 4 "The 2x2 Table"

Usage

```
Wald_CI_CC_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# An RCT of high vs standard dose of epinephrine (Perondi et al., 2004)
Wald_CI_CC_2x2(perondi_2004)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007)
Wald_CI_CC_2x2(ritland_2007)
```

Wald_CI_diff_CC_paired_2x2 *The Wald confidence interval for the difference between paired probabilities*

Description

The Wald confidence interval for the difference between paired probabilities

with continuity correction

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_diff_CC_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Wald_CI_diff_CC_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Wald_CI_diff_CC_paired_2x2(cavo_2012)
```

Wald_CI_diff_paired_2x2

The Wald confidence interval for the difference between paired probabilities

---

Description

The Wald confidence interval for the difference between paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_diff_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Wald_CI_diff_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Wald_CI_diff_paired_2x2(cavo_2012)
```

Wald_CI_OR_Laplace_paired_2x2

The Wald confidence interval for the conditional odds ratio with Laplace adjustment

---

Description

The Wald confidence interval for the conditional odds ratio with Laplace adjustment

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_OR_Laplace_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Wald_CI_OR_Laplace_paired_2x2(ezra_2010)
```

Wald_CI_OR_paired_2x2 *The Wald confidence interval for the conditional odds ratio*

Description

The Wald confidence interval for the conditional odds ratio

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_OR_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
Wald_CI_OR_paired_2x2(ezra_2010)
```

Wald_CI_ratio_paired_2x2 *The Wald confidence interval for the ratio of paired probabilities*

Description

The Wald confidence interval for the ratio of paired probabilities

Described in Chapter 8 "The Paired 2x2 Table"

Usage

```
Wald_CI_ratio_paired_2x2(n, alpha = 0.05)
```

Arguments

n	the observed counts (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Airway hyper-responsiveness before and after stem cell transplantation
# (Bentur et al., 2009)
Wald_CI_ratio_paired_2x2(bentur_2009)

# Complete response before and after consolidation therapy
# (Cavo et al., 2012)
Wald_CI_ratio_paired_2x2(cavo_2012)
```

Wald_test_1x2 *The Wald test for the binomial probability (pi)*

Description

The Wald test for the binomial probability (pi)

H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided)

Usage

```
Wald_test_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# The number of 1st order male births (adapted from Singh et al. 2010)
Wald_test_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.1)
# The number of 2nd order male births (adapted from Singh et al. 2010)
Wald_test_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.1)
# The number of 3rd order male births (adapted from Singh et al. 2010)
Wald_test_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.1)
# The number of 4th order male births (adapted from Singh et al. 2010)
Wald_test_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.1)
```

```
# Ligarden et al. (2010)
Wald_test_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.1)
```

`Wald_test_and_CI_common_diff_stratified_2x2`
The Wald test and CI for a common difference between probabilities

---

Description

The Wald test and CI for a common difference between probabilities based on either the Mantel-Haenszel or inverse variance estimate

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Wald_test_and_CI_common_diff_stratified_2x2(
  n,
  estimatetype = "MH",
  alpha = 0.05
)
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`estimatetype`	Mantel-Haenszel or inverse variance estimate ('MH' or 'IV')
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Wald_test_and_CI_common_diff_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Wald_test_and_CI_common_diff_stratified_2x2(hine_1989)
```

`Wald_test_and_CI_common_ratio_stratified_2x2` *The Wald test and CI for a common ratio of probabilities*

Description

The Wald test and CI for a common ratio of probabilities

based on either the Mantel-Haenszel or inverse variance estimate

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Wald_test_and_CI_common_ratio_stratified_2x2(
  n,
  estimatetype = "MH",
  alpha = 0.05
)
```

Arguments

`n`	the observed table (a 2x2xk matrix, where k is the number of strata)
`estimatetype`	Mantel-Haenszel or inverse variance estimate ('MH' or 'IV')
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Wald_test_and_CI_common_ratio_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Wald_test_and_CI_common_ratio_stratified_2x2(hine_1989)
```

Wald_test_and_CI_marginal_mean_ranks_paired_cxc

The Wald test and confidence interval for the difference between marginal mean ranks / ridits

Description

The Wald test and confidence interval for the difference between marginal mean ranks / ridits

Described in Chapter 9 "The Paired cxc Table"

Usage

```
Wald_test_and_CI_marginal_mean_ranks_paired_cxc(n, alpha = 0.05)
```

Arguments

n	the observed table (a cxc matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# A comparison between serial and retrospective measurements
# (Fischer et al., 1999)
Wald_test_and_CI_marginal_mean_ranks_paired_cxc(fischer_1999)
```

Wald_test_and_CI_marginal_mean_scores_paired_cxc

The Wald test and confidence interval for the difference between marginal mean scores

Description

The Wald test and confidence interval for the difference between marginal mean scores

Described in Chapter 9 "The Paired cxc Table"

Usage

```
Wald_test_and_CI_marginal_mean_scores_paired_cxc(
  n,
  a = seq_len(nrow(n)),
  alpha = 0.05
)
```

Arguments

n	the observed table (a cxc matrix)
a	scores assigned to the outcome categories
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# A comparison between serial and retrospective measurements
# (Fischer et al., 1999)
a <- c(8, 3.5, 0, -3.5, -8)
Wald_test_and_CI_marginal_mean_scores_paired_cxc(fischer_1999, a)
```

Wald_test_CC_1x2 *The Wald test with continuity correction for the binomial probability*

Description

The Wald test with continuity correction for the binomial probability (pi)

H_0: pi = pi0 vs H_A: pi ~= pi0 (two-sided)

Usage

```
Wald_test_CC_1x2(X, n, pi0)
```

Arguments

X	the number of successes
n	the total number of observations
pi0	a given probability

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# The number of 1st order male births (adapted from Singh et al. 2010)
Wald_test_CC_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"], pi0 = 0.1)
# The number of 2nd order male births (adapted from Singh et al. 2010)
Wald_test_CC_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"], pi0 = 0.1)
# The number of 3rd order male births (adapted from Singh et al. 2010)
Wald_test_CC_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"], pi0 = 0.1)
# The number of 4th order male births (adapted from Singh et al. 2010)
Wald_test_CC_1x2(singh_2010["4th", "X"], singh_2010["4th", "n"], pi0 = 0.1)
# Ligarden et al. (2010)
Wald_test_CC_1x2(ligarden_2010["X"], ligarden_2010["n"], pi0 = 0.1)
```

`Wilson_score_CI_1x2` *The Wilson score confidence interval*

Description

The Wilson score confidence interval

Usage

```
Wilson_score_CI_1x2(X, n, alpha = 0.05)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Reference Wilson EB (1927) Probable inference, the law of succession, and statistical inference. Journal of the American Statistical Association 22209-212

Examples

```
# birth order 1, Singh et al. (2010)
Wilson_score_CI_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
# birth order 2, Singh et al. (2010)
Wilson_score_CI_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
# birth order 3, Singh et al. (2010)
Wilson_score_CI_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
# birth order 4, Singh et al. (2010)
```

```
with(singh_2010["4th", ], Wilson_score_CI_1x2(X, n)) # alternative syntax
# Ligarden (2010)
Wilson_score_CI_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

`Wilson_score_CI_CC_1x2`

The Wilson score confidence interval with continuity correction for the binomial probability

---

Description

Described in Chapter 2 "The 1x2 Table and the Binomial Distribution"

Usage

```
Wilson_score_CI_CC_1x2(X, n, alpha = 0.05)
```

Arguments

`X`	the number of successes
`n`	the total number of observations
`alpha`	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

References

Reference Wilson EB (1927) Probable inference, the law of succession, and statistical inference. Journal of the American Statistical Association; 22209-212

Examples

```
# The number of 1st order male births (Singh et al. 2010)
Wilson_score_CI_CC_1x2(singh_2010["1st", "X"], singh_2010["1st", "n"])
# The number of 2nd order male births (Singh et al. 2010)
Wilson_score_CI_CC_1x2(singh_2010["2nd", "X"], singh_2010["2nd", "n"])
# The number of 3rd order male births (Singh et al. 2010)
Wilson_score_CI_CC_1x2(singh_2010["3rd", "X"], singh_2010["3rd", "n"])
# The number of 4th order male births (Singh et al. 2010)
with(singh_2010["4th", ], Wilson_score_CI_CC_1x2(X, n)) # alternative syntax
# Ligarden et al. (2010)
Wilson_score_CI_CC_1x2(ligarden_2010["X"], ligarden_2010["n"])
```

Woolf_logit_CI_2x2 *The Woolf logit confidence interval for the odds ratio*

Description

The Woolf logit confidence interval for the odds ratio

Described in Chapter 4 "The 2x2 Table"

Usage

```
Woolf_logit_CI_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2 matrix)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of `base::list()`. Use the `utils::str()` function to see the specific elements returned.

Examples

```
# A case-control study of GADA exposure on IPEX syndrome
# (Lampasona et al., 2013):
Woolf_logit_CI_2x2(lampasona_2013)

# The association between CHRNA4 genotype and XFS (Ritland et al., 2007):
Woolf_logit_CI_2x2(ritland_2007)
```

Woolf_test_and_CI_stratified_2x2 *The Woolf test and CI for a common odds ratio*

Description

The Woolf test and CI for a common odds ratio

(A Wald-type test and CI based on the inverse variance estimate)

Described in Chapter 10 "Stratified 2x2 Tables and Meta-Analysis"

Usage

```
Woolf_test_and_CI_stratified_2x2(n, alpha = 0.05)
```

Arguments

n	the observed table (a 2x2xk matrix, where k is the number of strata)
alpha	the nominal level, e.g. 0.05 for 95% CIs

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Smoking and lung cancer (Doll and Hill, 1950)
Woolf_test_and_CI_stratified_2x2(doll_hill_1950)

# Prophylactice use of Lidocaine in myocardial infarction (Hine et al., 1989)
Woolf_test_and_CI_stratified_2x2(hine_1989)
```

Z_unpooled_test_2x2 *The Z-unpooled test for association in 2x2 tables*

Description

The Z-unpooled test for association in 2x2 tables

Described in Chapter 4 "The 2x2 Table"

Usage

```
Z_unpooled_test_2x2(n)
```

Arguments

n	the observed counts (a 2x2 matrix)

Value

An object of the contingencytables_result class, basically a subclass of base::list(). Use the utils::str() function to see the specific elements returned.

Examples

```
# Example: A lady tasting a cup of tea
Z_unpooled_test_2x2(tea)

# Example: Perondi et al. (2004)
Z_unpooled_test_2x2(perondi_2004)

# Example: Lampasona et al. (2013)
```

```
Z_unpooled_test_2x2(lampasona_2013)

# Example: Ritland et al. (2007)
Z_unpooled_test_2x2(ritland_2007)
```

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