Package 'nonpar'

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Type Package

Title A Collection of Nonparametric Hypothesis Tests

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Depends R (>= 3.3.1)

Imports methods

Description Contains the following 5 nonparametric hypothesis tests:
The Sign Test,
The 2 Sample Median Test,
Miller's Jackknife Procedure,
Cochran's Q Test, &
The Stuart-Maxwell Test.

License GPL-3

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LazyData true

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R topics documented:

`cochrans.q`   *Cochran's Q Test*

Description

This function will perform the Cochran's Q Test to test for identical treatment effects in a two-way randomized block design with k treatments.

Usage

```
cochrans.q(x, alpha=NULL)
```

Arguments

x	A b x k matrix, where b is the number of blocking factors and k is the number of treatment factors.
alpha	The Significance level, defaults to 0.05.

Value

Q	This is the Cochran's Q Test Statistic.
Degrees of Freedom	
	The number of degrees of freedom used in calculating the p-value.
Significance Level	
	Returns the alpha value.
P-value	Returns the p-value from the Cochran's Q Test.

Author(s)

D. Lukke Sweet

References

https://www.r-bloggers.com/cochran-q-test-for-k-related-samples-in-r/

http://rcompanion.org/handbook/H_07.html

Examples

```
## Run Cochran's Q Test on a matrix.
cochrans.q(matrix(c(1,1,1,1,1,1,
           1,1,0,1,1,1,
           0,0,0,1,0,0,
           0,1,0,0,1,1), 6, 4))

## Cochran's Q Test works for any size matrix.
cochrans.q(matrix(c(0,1,0,0,1,0,0,0,1,0,0,0,0,0,
              0,1,1,1,1,1,1,1,0,1,1,1,1,1,
```

```
              0,1,0,0,0,0,0,0,1,0,0,0,0,0,
              0,1,1,0,0,1,1,0,0,0,0,1,0,1), 14, 4), alpha=0.01)
```

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mediantest   *2 Sample Median Test*

Description

The 2 sample median test is for testing the medians of 2 samples to see if they are equal.

Usage

```
    mediantest(x, y, alpha=NULL, exact=FALSE)
```

Arguments

x	A vector containing data from the first sample.
y	A vector containing data from the second sample.
alpha	The Significance level, defaults to 0.05.
exact	Defaults to FALSE. Runs the exact test or a large sample approximation.

Value

Z	The test statistic for the large sample approximation.
P-value	Returns the p-value from the Median Test.

Author(s)

D. Lukke Sweet

References

Higgins, J. J. (2005). An Introduction to modern nonparametric statistics. Belmont: Thomson Brooks/Cole.

Wiley Series in Probability and Statistics: Nonparametric Statistical Methods (3rd Edition). (2013). John Wiley & Sons.

Examples

```
    ## Run the Median Test on the 2 vectors.
    mediantest(x = c(5.5, 5.8, 6.8, 6.9, 7.2, 7.3, 7.5, 7.6, 8.0),
               y = c(5.3, 5.4, 5.6, 5.7, 6.2, 6.4, 6.6, 6.7, 8.2), exact=TRUE)
```

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miller.jack　　　　　　　*The Miller Jacknife Procedure*

Description

This function will perform Miller's Jackknife Procedure to test differences in scale between 2 samples. It is best for large samples.

Usage

```
miller.jack(x, y, alpha = NULL,
alternative =c("two.sided", "greater", "less"), exact = FALSE)
```

Arguments

x	A vector containing data from the first sample.
y	A vector containing data from the second sample.
alpha	The Significance level, defaults to 0.05.
alternative	Defaults to two.sided. Used to determine what type of test to run.
exact	Defaults to FALSE. Used to determine whether to run the exact procedure or a large sample approximation.

Value

J	The test statistic.
Significance Level	
	Returns the alpha value.
P-value	Returns the p-value from Miller's Jackknife Procedure.

Author(s)

D. Lukke Sweet

References

Wiley Series in Probability and Statistics: Nonparametric Statistical Methods (3rd Edition). (2013). John Wiley & Sons.

Examples

```
## Run Miller's Jackknife Procedure on the 2 vectors.
miller.jack(x= c(6.2, 5.9, 8.9, 6.5, 8.6),
            y = c(9.5, 9.8, 9.5, 9.6, 10.3), alpha=0.05, alternative="less")
```

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signtest   *The Sign Test*

Description

A nonpametric test for center. The sign test compares the median to a value.

Usage

```
signtest(x, m = NULL, alpha = NULL,
alternative =c("two.sided", "greater", "less"), conf.level=NULL, exact = FALSE)
```

Arguments

x	A vector of sample data.
m	The median to test. Defaults to 0.
alpha	The Significance level, defaults to 0.05.
alternative	Defaults to two.sided. Used to determine what type of test to run.
conf.level	Defaults to NULL. Used to construct a confidence interval. Input as a decimal.
exact	Defaults to FALSE. Used to determine whether to run the exact procedure or a large sample approximation.

Value

B	The Test Statistic
Significance Level	
	Returns the alpha value.
P-value	Returns the p-value from the Sign Test.
Confidence Interval	
	The confidence interval requested.

Author(s)

D. Lukke Sweet

References

Higgins, J. J. (2005). An Introduction to modern nonparametric statistics. Belmont: Thomson Brooks/Cole.

Wiley Series in Probability and Statistics: Nonparametric Statistical Methods (3rd Edition). (2013). John Wiley & Sons.

Examples

```
## Run the Sign Test on the vector.
signtest(c(1.8, 3.3, 5.65, 2.25, 2.5, 3.5, 2.75, 3.25, 3.10, 2.70, 3, 4.75, 3.4), m=3.5)
```

stuart.maxwell   *The Stuart-Maxwell Test*

Description

This function runs the Stuart-Maxwell Test, an extension of McNemar's for a 3x3 matrix.

Usage

```
stuart.maxwell(X, alpha = NULL)
```

Arguments

X	A 3x3 matrix of frequencies.
alpha	The Significance level, defaults to 0.05.

Value

Test Statistic	The Test Statistic for the Stuart-Maxwell Test.
Significance Level	
	Returns the alpha value.
P-value	Returns the p-value from the Stuart-Maxwell Test.

Author(s)

D. Lukke Sweet

Examples

```
## Run the Stuart-Maxwell Test on the 3x3 Matrix.
stuart.maxwell(matrix(c(12, 30, 13, 7, 70, 34, 3, 20, 32), 3,3))
```

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