

Package ‘Mychisq’

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Type Package

Title Chi-Squared Test for Goodness of Fit and Independence Test

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Language en-US

Maintainer Atchanut Rattanalertnusorn <atchanut_r@rmutt.ac.th>

Description The chi-squared test for goodness of fit
and an independence test. In addition, the chi-squared test for the population variance,
the function for computing a confidence interval for the population variance,
and the function for calculating the population standard deviation are provided.

License GPL-3

Encoding UTF-8

Imports stats,graphics

RoxygenNote 7.3.2

Suggests testthat (>= 3.0.0)

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NeedsCompilation no

Author Atchanut Rattanalertnusorn [cre, aut],
Jiranant Choojai [aut],
Chutima Philadee [aut],
Kittipong Klinjan [aut],
Issaraporn Thiamsorn [aut]

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`gofchisq`*Goodness of fit test*

Description

This function is for the goodness of fit test of one categorical variable

Usage

```
gofchisq(x, p, conf.level = 0.95)
```

Arguments

<code>x</code>	an observed frequency vector
<code>p</code>	probability of each group
<code>conf.level</code>	confidence level for testing hypothesis, default is 0.95, user can change to 0.90 or otherwise

Value

output for the goodness of fit test

References

Chernoff, H. and Lehmann, E.L. (1954) The Use of Maximum Likelihood Estimates in Chi-Square Tests for Goodness of Fit. *Annals of Mathematical Statistics*, 25, 579-586. <doi.org/10.1214/aoms/1177728726>.

Examples

```
x=c(12,9,10,7,12)
prob=c(1/5,1/5,1/5,1/5,1/5) #1:1:1:1:1
gofchisq(x=x,p=prob)
```

indchisq	<i>Independence test</i>
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Description

This function is for the independence test of two categorical variables

Usage

```
indchisq(0, conf.level = 0.95)
```

Arguments

0	an observed matrix has a rows and b columns
conf.level	confidence level for testing hypothesis, default is 0.95, user can change to 0.90 or otherwise

Value

output for the independence test

References

Plackett, R. L. (1983). Karl Pearson and the Chi-Squared Test. *International Statistical Review / Revue Internationale de Statistique*, 51(1), 59–72. <doi.org/10.2307/1402731>.

Examples

```
v <- c(80,60,150,50,40,20)
X<- matrix(v,ncol=2,byrow = TRUE) # 3x2
indchisq(X)
```

plotchisq	<i>Plot of Chi-squared distribution</i>
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Description

The plot of Chi-squared distribution with k degrees of freedom

Usage

```
plotchisq(df = 8)
```

Arguments

df	degrees of freedom
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Value

The figure of Chi-squared distribution with k degrees of freedom

Examples

```
plotchisq(df=15)
```

sigmaCI

Confidence interval for the population standard deviation

Description

A function 'sigmaCI()' is used to compute a confidence interval of the population standard deviation when given a numeric vector

Usage

```
sigmaCI(x, conf.level = 0.95)
```

Arguments

x a numeric vector

conf.level a confidence level, default is 0.95; the user can change to 0.90 or otherwise

Value

a confidence interval of the population standard deviation

References

Rattanaertnusorn, A. (2024). R and its application (3rd ed.). TPN press. <<https://www.researchgate.net/publication/3719442>>

Examples

```
height <- c(155.5, 165.5, 170, 164.5, 180, 162, 173, 158.5, 168.5, 175, 164.5, 167)
sigmaCI(x=height,conf.level = 0.90)
```

sigmatest*Hypothesis testing for the population variance*

Description

The function 'sigmatest()' is used to test the hypothesis about the population variance

Usage

```
sigmatest(  
  x,  
  sigma,  
  alternative = c("two.sided"),  
  conf.level = 0.95,  
  verbose = TRUE  
)
```

Arguments

x	a numeric vector
sigma	a population standard deviation under the null hypothesis
alternative	an alternative hypothesis, default is "two.sided"; the user can change to "greater" or "less"
conf.level	a confidence level for hypothesis testing, default is 0.95; the user can change to 0.90 or otherwise
verbose	a special variable is used for protected unexpected print output; the default is TRUE, do NOT change

Value

output of one sample Chi-squared test for variance

References

Rattanalertnusorn, A. (2024). R and its application (3rd ed.). TPN press. <<https://www.researchgate.net/publication/3719442>

Examples

```
height <- c(155.5, 165.5, 170, 164.5, 180, 162, 173, 158.5, 168.5, 175, 164.5, 167)  
sigmatest(x=height, sigma = 3, alternative = "two.sided", conf.level = 0.95)
```

varCI	<i>Confidence interval for the population variance</i>
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Description

A function 'varCI()' is used to calculate a confidence interval for the population variance when given a numerical vector

Usage

```
varCI(x, conf.level = 0.95)
```

Arguments

- x a numeric vector
- conf.level a confidence level, default is 0.95; the user can change to 0.90 or otherwise

Value

a confidence interval of the population variance

References

Rattanalertnusorn, A. (2024). R and its application (3rd ed.). TPN press. <<https://www.researchgate.net/publication/3719442>

Examples

```
heigh<- c(155.5, 165.5, 170, 164.5, 180, 162, 173, 158.5, 168.5, 175, 164.5, 167)
varCI(x=heigh,conf.level = 0.90)
```

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