Package ‘hypothesestest’

February 20, 2015

Type Package
Title Confidence Intervals and Tests of Statistical Hypotheses
Version 1.0
Date 2012-05-14
Author Chengfeng Liu, Huiqing Liu, Yingyan Liang, Ruibin Feng
Maintainer Chengfeng Liu <478996606@qq.com>
Description Compute the confidence interval of the population mean with one sample or of the difference of population means of two samples from normal distributions or t-distributions. Compute the confidence interval of population variance with one sample or of the difference of population variances of two samples by chi-square tests. Test for population mean or the differences of two normal samples under normality with the given null hypothesis H0, which depends on the user, so that he can know if he can reject H0 or not at the significance level alpha. Do the chi-square tests with one or two samples which have multinomial distributions by using an approximate chi-square distribution when n is large enough.
License GPL (>= 2)
Repository CRAN
Date/Publication 2012-07-11 11:35:50
NeedsCompilation no

R topics documented:

hypothesistest-package ................................................. 2
conint ................................................................. 2
findroot ............................................................... 4
hypothesis ............................................................ 5

Index 7
hypothesis-package

hypothesis

Description

Create a test of statistical hypothesis for the estimation of a parameter.

Details

Package: hypothesis
Type: Package
Version: 1.0
Date: 2012-05-14
License: GPL (>=2)

The aim of the package is to build a test of statistical hypothesis.

Author(s)

Chengfeng Liu, Huiqing Liu, Yingyan Liang and Ruibin Feng
Maintainer: Chengfeng Liu<478996606@qq.com>

See Also

confidence interval and findroot

Examples

conint(m=67.53,n1=25,n2=10,side="both",alpha=0.95,method="n") #63.61 71.45
findroot(alpha = 0.05, side = "both", method = "n", n=30, mu = 0, sigma = 1) # 1.959961
hypothesis(TrnX=c(3,4,5),TrnY=c(4,5,6),m,u0=4.3,3,s1=NULL,s2=NULL,sigma1=NULL,sigma2=NULL,alpha=0.05,method="n"
# "we can not reject H0."
# "t is"
# 4.302673
# "Q is"
# 0
# "p-value is"
# 1

conint Calculate the Confidence Interval
Description

Calculate the confidence interval of the mean from a population or the difference between two means from two populations.

Usage

```r
conint(TrnX = NULL, TrnY = NULL, m, n1, n2, s1, s2, side = "both", alpha = 0.95, method = "n")
```

Arguments

- `TrnX`: the observed values of a random sample from a distribution
- `TrnY`: the observed values of a random sample from another distribution
- `m`: the mean of the observed values of the first random sample
- `n1`: the number of the random variables of TrnX
- `n2`: the number of the random variables of TrnY
- `s1`: the standard variance of TrnX
- `s2`: the standard variance of TrnY
- `side`: whether the confidence interval is one or two sides
- `alpha`: the significance level of the confidence level
- `method`: Are we going to calculate the confidence interval of the mean from a population or the difference between two means from two populations? Is the population from a normal distribution, a t distribution or a chi-square distribution?

Details

The confidence interval consists of some information such as the significance level and whether it is one or two sides. The random samples may come from normal distributions, t distributions or chi-square distributions.

Value

- `a`: the left end point of the confidence interval
- `b`: the right end point of the confidence interval

Note

Although we have the confidence interval of the mean or the difference between two means, we can’t ensure that the mean or the difference between two means is bound to be in the confidence interval.

Author(s)

Chengfeng Liu, Huiqing Liu, Yingyan Liang and Ruibin Feng Maintainer: Chengfeng Liu <(478996606@qq.com)>

See Also

- `findroot`
findroot

Examples
conint(m=67.53,n1=25,s1=10,side="both",alpha=0.05,method="n") #63.61 71.45

findroot

find the Z score

Description
find the Z score of normal distribution, standard normal distribution, chi-square or t-distribution

Usage
findroot(alpha = 0.05, side = "both", method = "n", n, mu = 0, sigma = 1)

Arguments
alpha       the significance level of the confidence level
side        whether the confidence interval is one or two sides
method      the distribution of the samples follow
n           the amount of the samples
mu          the average of the samples
sigma       the standard deviation of the population

Details
if necessary, please input mu and sigma when the samples don’t follow the standard normal distribution

Value
the value return 'z score'(A measure of the distance in standard deviations of a sample from the mean.)

Note
this function can only be used in standard normal distribution, standard normal distribution, chi-square and t-distribution. If the samples don’t have the standard normal distribution, please input mu and sigma.

Author(s)
Chengfeng Liu, Huiqing Liu, Yingyan Liang and Ruibin Feng
Maintainer: Chengfeng Liu <(478996606@qq.com)>

See Also
hypothesis
### Examples

```
# find the z score
findroot(alpha = 0.05, side = "both", method = "n", n=30, mu = 0, sigma = 1)
# 1.959961
```

---

**hypothesis**

_hypothesis test a claim_

**Description**

a hypothesis test to test a claim about \( \mu=H_0 \) of a population.

**Usage**

```
hypothesis(TrnX = NULL, TrnY = NULL, m, u0, n1, n2, s1 = NULL, s2 = NULL, sigma1 = NULL, sigma2 = NULL, alpha = 0.05, method = "n")
```

**Arguments**

- `TrnX`: the observed values of a random sample from a distribution which must be input as vectors
- `TrnY`: the observed values of a random sample from another distribution which must be input as vectors
- `m`: the mean of the bias of TrnX and TrnY
- `u0`: the claim that \( H_0: \mu=u_0 \)
- `n1`: the amount of the sample TrnX
- `n2`: the amount of the sample TrnY
- `s1`: the standard deviation of the sample TrnX
- `s2`: the standard deviation of the sample TrnY
- `sigma1`: the standard deviation of the population TrnX
- `sigma2`: the standard deviation of the population TrnY
- `alpha`: the confident level of the hypothesis test
- `method`: the distribution of the samples follow
- `H0`: the claim about the population
- `p`: p value which correspond to the z score

**Details**

you can either input the original data of TrnX and TrnY, or just input \( s1, s2, n1, n2 \)

**Value**

- **refuse \( H_0 \)**: at the confident level of \( \alpha \), we choose to refuse \( H_0 \)
- **we can not reject \( H_0 \)**: at the confident level of \( \alpha \), we choose not to refuse \( H_0 \)
Note

must input the distribution that the samples follow: normal distribution, standard normal distribution, chi-square and t-distribution. When there are two samples, please input m which is the average of TrnX-TrnY

Author(s)

Chengfeng Liu, Huiqing Liu, Yingyan Liang and Ruibin Feng
Maintainer: Chengfeng Liu <(478996606@qq.com)>

See Also

conint

Examples

```r
## to test the claim
hypothesis(TrnX=c(3,4,5),TrnY=c(4,5,6),m,u0=4,3,3,s1=NULL,s2=NULL,sigma1=NULL,sigma2=NULL,alpha=0.05,method="n")
# "we can not reject H0."
# "t is"
# 4.302673
# "Q is"
# 0
# "p-value is"
# 1
```
Index

*Topic **confidence interval**
  conint, 2

*Topic **findroot**
  findroot, 4

*Topic **hypothesis test**
  hypothesis, 5

*Topic **hypothesis**
  hypothesis-test-package, 2

conint, 2, 6

findroot, 3, 4

hypothesis, 4, 5

hypothesis-test
  (hypothesis-test-package), 2

hypothesis-test-package, 2