Package: jackknifeR (via r-universe)

October 27, 2024

Type Package

Title Delete-d Jackknife for Point and Interval Estimation

Version 1.2.0

Description This function creates jackknife samples from the data by sequentially removing d observations from the data, performs estimation using the jackknife samples and calculates the jackknife coefficients, bias, standard error and confidence intervals based on the methodology discussed by Quenouille (1956) <doi:10.2307/2332914>, Tukey (1958) <doi:10.1214/aoms/1177706647> and Shi (1988) <doi:10.1016/0167-7152(88)90011-9>.

License GPL (>= 3)

BugReports https://github.com/MohanasundaramS/jackknifeR/issues

Imports doParallel, foreach, utils

Encoding UTF-8

Roxygen list(markdown = TRUE)

RoxygenNote 7.2.3

Repository https://mohanasundarams.r-universe.dev

RemoteUrl https://github.com/mohanasundarams/jackknifer

RemoteRef HEAD

RemoteSha 5b1fda07de4142e1452580f0abb9e1188fbc3839

Contents

`jackknife` *Delete-d Jackknife for Estimates*

Description

This function creates jackknife samples from the data by sequentially removing d observations from the data, and calculates the estimates by the specified function and its bias, standard error, and confidence intervals.

Usage

```
jackknife(statistic, d = 1, data, conf = 0.95, numCores = detectCores())
```

Arguments

`statistic`	a function returning a vector of estimates to be passed to jackknife
`d`	Number of observations to be deleted from data to make jackknife samples. The default is 1 (for delete-1 jackknife).
`data`	Data frame with dependent and independent independent variables specified in the formula
`conf`	Confidence level, a positive number < 1. The default is 0.95.
`numCores`	Number of processors to be used

Value

A list containing a summary data frame of jackknife estimates with bias, standard error. t-statistics, and confidence intervals, estimate for the original sample and a data frame with estimates for jackknife samples.

References

Quenouille, M. H. (1956). Notes on Bias in Estimation. *Biometrika*, *43*(3/4), 353-360. doi:10.2307/2332914

Tukey, J. W. (1958). Bias and Confidence in Not-quite Large Samples. *Annals of Mathematical Statistics*, *29*(2), 614-623. doi:10.1214/aoms/1177706647

Shi, X. (1988). A note on the delete-d jackknife variance estimators. *Statistics & Probability Letters*, *6*(5), 341-347. doi:10.1016/01677152(88)900119

See Also

`jackknife.lm()` which is used for jackknifing in linear regression.

Examples

```
## library(jackknifeR)
fn <- function(data){
   mod <- lm(speed~dist, data = data)
   return(coef(mod))}
jkn <- jackknife(statistic = fn, d = 2, data = cars, numCores= 2)
jkn
```

`jackknife.cor` *Delete-d Jackknife Estimate for Correlation between Two Variables*

Description

This function creates jackknife samples from the data by sequentially removing *d* observations from the data, calculates correlation between the two variables using the jackknife samples and estimates the jackknife correlation coefficients, bias standard error, standard error and confidence intervals.

Usage

```
jackknife.cor(data, d = 1, conf = 0.95, numCores = detectCores())
```

Arguments

`data`	A data frame with two columns of numerical values for which the jackknife estimate of correlation needs to be found. estimated
`d`	Number of observations to be deleted from data to make jackknife samples. The default is 1 (for delete-1 jackknife).
`conf`	Confidence level, a positive number < 1. The default is 0.95.
`numCores`	Number of processors to be used

Value

A list containing a summary data frame of jackknife correlation coefficient estimates with bias, standard error. t-statistics, and confidence intervals,correlation estimate of original data and a data frame with correlation estimates of individual jackknife samples.

References

Quenouille, M. H. (1956). Notes on Bias in Estimation. *Biometrika*, *43*(3/4), 353-360. doi:10.2307/2332914

Tukey, J. W. (1958). Bias and Confidence in Not-quite Large Samples. *Annals of Mathematical Statistics*, *29*(2), 614-623. doi:10.1214/aoms/1177706647

Shi, X. (1988). A note on the delete-d jackknife variance estimators. *Statistics & Probability Letters*, *6*(5), 341-347. doi:10.1016/01677152(88)900119

See Also

`cor()` which is used to estimate correlation coefficient.

Examples

```
## library(jackknifeR)
j.cor <- jackknife.cor(cars, d = 2, numCores = 2)
summary(j.cor)
```

`jackknife.lm` *Delete-d Jackknife Estimate for Linear Regression*

Description

This function creates jackknife samples from the data by sequentially removing *d* observations from the data, fits models linear regression model using the jackknife samples as specified in the formula and estimates the jackknife coefficients bias standard error, standard error and confidence intervals.

Usage

```
jackknife.lm(formula, d = 1, data, conf = 0.95, numCores = detectCores())
```

Arguments

`formula`	Simple or multiple linear regression formula with dependent and independent variables
`d`	Number of observations to be deleted from data to make jackknife samples. The default is 1 (for delete-1 jackknife).
`data`	Data frame with dependent and independent independent variables specified in the formula
`conf`	Confidence level, a positive number < 1. The default is 0.95.
`numCores`	Number of processors to be used

Value

A list containing a summary data frame of jackknife estimates with bias, standard error. t-statistics, and confidence intervals, linear regression model of original data and a data frame with coefficient estimates of jackknife samples.

References

Quenouille, M. H. (1956). Notes on Bias in Estimation. *Biometrika*, *43*(3/4), 353-360. doi:10.2307/2332914

Tukey, J. W. (1958). Bias and Confidence in Not-quite Large Samples. *Annals of Mathematical Statistics*, *29*(2), 614-623. doi:10.1214/aoms/1177706647

Shi, X. (1988). A note on the delete-d jackknife variance estimators. *Statistics & Probability Letters*, *6*(5), 341-347. doi:10.1016/01677152(88)900119

See Also

`lm()` which is used for linear regression.

Examples

```
## library(jackknifeR)
j.lm <- jackknife.lm(dist~speed, d = 2, data = cars, numCores = 2)
summary(j.lm)
```

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