Package 'ictools'

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Title Unified Tools for Classical and Bootstrap Confidence Intervals

Version 0.1.0

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Description Provides a unified and consistent interface for computing classical and bootstrap confidence intervals for means, variances, proportions, variance ratios, and regression coefficients. The package offers a standardized output structure, S3 classes, and user-friendly methods to facilitate statistical analysis and reproducibility.

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Encoding UTF-8

Depends R (>= 3.5.0)

Imports stats

Suggests testthat (>= 3.0.0), knitr, rmarkdown

Config/testthat/edition 3

URL https://github.com/RayanSiffeO/ictools

BugReports https://github.com/RayanSiffeO/ictools/issues

RoxygenNote 7.3.3

NeedsCompilation no

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Repository CRAN

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Contents

`ic_pmean` *Confidence Interval for the Mean*

Description

Computes confidence intervals for a population mean.

Usage

```
ic_pmean(
  x,
  conf.level = 0.95,
  type = c("two.sided", "upper", "lower"),
  method = c("t", "z"),
  sigma = NULL,
  na.rm = TRUE
)
```

Arguments

`x`	Numeric vector, matrix, or data.frame.
`conf.level`	Confidence level (default 0.95).
`type`	Character. "two.sided", "upper", or "lower".
`method`	Character. "t" (default) or "z".
`sigma`	Known population standard deviation (required if method = "z").
`na.rm`	Logical. Whether to remove NA values.

Value

A list of class "ic_pmean" with mean estimate and confidence interval.

Examples

```
data <- c(5, 7, 8, 6, 9, 10)
ic_pmean(data)
ic_pmean(data, conf.level = 0.99)
mat <- matrix(data, nrow = 2)
ic_pmean(mat)
```

ic_prop *Confidence Interval for a Proportion*

Description

Computes confidence intervals for a population proportion.

Usage

```
ic_prop(
  x,
  conf.level = 0.95,
  success = c(1, "yes", "true"),
  method = c("wilson", "wald", "clopper"),
  na.rm = TRUE
)
```

Arguments

x	Numeric vector (0/1) or matrix of 0/1.
conf.level	Confidence level (default 0.95).
success	Value considered a success (default 1, "yes", "true").
method	Character. "wilson", "wald", or "clopper".
na.rm	Logical. Whether to remove NA values.

Value

A list of class "ic_proportion" with proportion estimate and confidence interval.

Examples

```
data <- matrix(c(1, 0, 1, 1, 0, 1), nrow = 2)
ic_prop(data)
ic_prop(data, conf.level = 0.99)
```

ic_razon_var *Confidence Interval for the Ratio of Variances*

Description

Computes confidence intervals for the ratio of two population variances.

Usage

```
ic_razon_var(
  x,
  y,
  conf.level = 0.95,
  method = c("f", "log", "bootstrap"),
  R = 2000,
  na.rm = TRUE
)
```

Arguments

x	Numeric vector or matrix (first sample).
y	Numeric vector or matrix (second sample).
conf.level	Confidence level (default 0.95).
method	Character. "f", "log", or "bootstrap".
R	Number of bootstrap replicates (default 2000).
na.rm	Logical. Whether to remove NA values.

Value

A list of class "ic_var_ratio" with ratio estimate and confidence interval.

Examples

```
data1 <- matrix(c(5, 7, 8, 6, 9, 10), nrow = 2)
data2 <- matrix(c(4, 6, 7, 5, 8, 9), nrow = 2)
ic_razon_var(data1, data2)
ic_razon_var(data1, data2, conf.level = 0.99)
```

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ic_reg *Confidence Intervals for Regression Coefficients*

Description

Computes confidence intervals for the coefficients of a linear model (lm).

Usage

```
ic_reg(
  model,
  conf.level = 0.95,
  method = c("classical", "bootstrap", "residual"),
  R = 2000
)
```

Arguments

model	An object of class lm.
conf.level	Confidence level (defaults to 0.95).
method	Método para calcular el intervalo: "classical", "bootstrap" o "residual".
R	Número de réplicas bootstrap (solo para métodos bootstrap/residual).

Value

An object of class ic_reg containing the estimate and the confidence interval.

Examples

```
# Create sample data
test_data <- data.frame(
  y = c(5, 6, 7, 8, 9, 10),
  x1 = c(1, 2, 3, 4, 5, 6),
  x2 = c(2, 1, 3, 2, 4, 5)
)

# Fit model and calculate CI
fit <- lm(y ~ x1 + x2, data = test_data)
ic_reg(fit)
```

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ic_var *Confidence Interval for the Variance*

Description

Computes confidence intervals for a population variance.

Usage

```
ic_var(
  x,
  conf.level = 0.95,
  type = c("two.sided", "upper", "lower"),
  na.rm = TRUE
)
```

Arguments

x	Numeric vector or matrix.
conf.level	Confidence level (default 0.95).
type	Character. "two.sided", "upper", or "lower".
na.rm	Logical. Whether to remove NA values.

Value

A list of class "ic_var" with variance estimate and confidence interval.

Examples

```
data <- matrix(c(5, 7, 8, 6, 9, 10), nrow = 2)
ic_var(data)
ic_var(data, conf.level = 0.99)
```

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