Package 'wstats'

May 8, 2026

Title Weighted Descriptive Statistics

Version 0.1.1

Description Weighted versions of common descriptive statistics (variance, standard deviation, covariance, correlation, quantiles).

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Encoding UTF-8

RoxygenNote 7.3.3

Imports glue, rlang

Suggests pkgdown, testthat (>= 3.0.0)

Config/testthat/edition 3

LinkingTo cpp11

NeedsCompilation yes

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Repository CRAN

Date/Publication 2026-03-12 08:20:02 UTC

Contents

weighted_cor *Weighted correlation*

Description

Weighted correlation coefficient, computed as `weighted_cov(x, y, w) / (weighted_sd(x, w) * weighted_sd(y, w))`.

Usage

```
weighted_cor(x, y, w, na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`y`	A numeric vector of observations (same length as `x`).
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, observations with any `NA` in `x`, `y`, or `w` are removed before computation.

Value

A single numeric value in [-1, 1].

weighted_cov *Weighted covariance*

Description

Computes the population (importance-weight) weighted covariance `sum(w_hat * (x - mu_x) * (y - mu_y))`.

Usage

```
weighted_cov(x, y, w, na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`y`	A numeric vector of observations (same length as `x`).
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, observations with any `NA` in `x`, `y`, or `w` are removed before computation.

Value

A single numeric value.

weighted_kurtosis *Weighted excess kurtosis*

Description

Computes the population weighted excess kurtosis: `sum(w_hat * ((x - mu) / sigma)^4) - 3`.

Usage

```
weighted_kurtosis(x, w, na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, paired `NA`s in `x` and `w` are removed before computation. If `FALSE` (default) and any `NA` is present, `NA` is returned.

Value

A single numeric value.

weighted_mad *Weighted median absolute deviation*

Description

Computes the weighted MAD as the weighted median of `|x - median(x, w)|`, scaled by `constant` (default 1.4826 for consistency with `stats::mad()` under normality).

Usage

```
weighted_mad(x, w, na.rm = FALSE, constant = 1.4826)
```

Arguments

`x`	A numeric vector of observations.
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, paired `NA`s in `x` and `w` are removed before computation. If `FALSE` (default) and any `NA` is present, `NA` is returned.
`constant`	Scale factor (default `1.4826`).

Value

A single numeric value.

weighted_median *Weighted median*

Description

Convenience wrapper: `weighted_quantile(x, w, 0.5, na.rm)`.

Usage

```
weighted_median(x, w, na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, paired `NA`s in `x` and `w` are removed before computation. If `FALSE` (default) and any `NA` is present, `NA` is returned.

Value

A single numeric value.

weighted_quantile *Weighted quantiles*

Description

Computes weighted quantiles using a type-7 analog: observations are placed at the midpoints of their weight intervals in the cumulative weight distribution, rescaled to [0, 1], and quantiles are obtained by linear interpolation. For equal weights this matches `quantile(x, type = 7)`.

Usage

```
weighted_quantile(x, w, probs = seq(0, 1, 0.25), na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`w`	A numeric vector of non-negative weights (need not sum to 1).
`probs`	A numeric vector of probabilities in [0, 1].
`na.rm`	Logical. If `TRUE`, paired `NA`s in `x` and `w` are removed.

Value

A numeric vector of the same length as `probs`.

weighted_sd *Weighted standard deviation*

Description

Square root of `weighted_var()`.

Usage

```
weighted_sd(x, w, na.rm = FALSE)
```

Arguments

x	A numeric vector of observations.
w	A numeric vector of non-negative weights (need not sum to 1).
na.rm	Logical. If TRUE, paired NAs in x and w are removed before computation. If FALSE (default) and any NA is present, NA is returned.

Value

A single numeric value.

weighted_skewness *Weighted skewness*

Description

Computes the population weighted skewness (Fisher's g1): `sum(w_hat * ((x - mu) / sigma)^3)`.

Usage

```
weighted_skewness(x, w, na.rm = FALSE)
```

Arguments

x	A numeric vector of observations.
w	A numeric vector of non-negative weights (need not sum to 1).
na.rm	Logical. If TRUE, paired NAs in x and w are removed before computation. If FALSE (default) and any NA is present, NA is returned.

Value

A single numeric value.

`weighted_var` *Weighted variance*

Description

Computes the population (importance-weight) weighted variance `sum(w_hat * (x - mu)^2)` where `w_hat = w / sum(w)` and `mu = weighted.mean(x, w)`.

Usage

```
weighted_var(x, w, na.rm = FALSE)
```

Arguments

`x`	A numeric vector of observations.
`w`	A numeric vector of non-negative weights (need not sum to 1).
`na.rm`	Logical. If `TRUE`, paired `NA`s in `x` and `w` are removed before computation. If `FALSE` (default) and any `NA` is present, `NA` is returned.

Value

A single numeric value.

Index