

Package: wstats (via r-universe)

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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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weighted_cor	<i>Weighted correlation</i>
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Description

Weighted correlation coefficient, computed as $\text{weighted_cov}(x, y, w) / (\text{weighted_sd}(x, w) * \text{weighted_sd}(y, w))$.

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	<i>Weighted covariance</i>
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Description

Computes the population (importance-weight) weighted covariance $\text{sum}(w_hat * (x - \mu_x) * (y - \mu_y))$.

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	<i>Weighted excess kurtosis</i>
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Description

Computes the population weighted excess kurtosis: $\text{sum}(w_hat * ((x - \mu) / \text{sigma})^4) - 3$.

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 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_mad	<i>Weighted median absolute deviation</i>
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Description

Computes the weighted MAD as the weighted median of $|x - \text{median}(x, w)|$, 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 NAs 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	<i>Weighted median</i>
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Description

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

Usage

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

Arguments

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

Value

A single numeric value.

weighted_quantile	<i>Weighted quantiles</i>
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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

<code>x</code>	A numeric vector of observations.
<code>w</code>	A numeric vector of non-negative weights (need not sum to 1).
<code>probs</code>	A numeric vector of probabilities in $[0, 1]$.
<code>na.rm</code>	Logical. If TRUE, paired NAs in <code>x</code> and <code>w</code> are removed.

Value

A numeric vector of the same length as probs.

weighted_sd	<i>Weighted standard deviation</i>
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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	<i>Weighted skewness</i>
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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	<i>Weighted variance</i>
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Description

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

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 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.

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