Package ‘wdm’

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Description


Details

The DESCRIPTION file: This package was not yet installed at build time.

indep_test

Independence Tests for Weighted Dependence Measures

Description

Computes a (possibly weighted) dependence measure between x and y if these are vectors. If x and y are matrices then the measure between the columns of x and the columns of y are computed.

Usage

indep_test(
  x, y,
  method = "pearson",
  weights = NULL,
  remove_missing = TRUE,
  alternative = "two-sided"
)

Arguments

x, y numeric vectors of data values. x and y must have the same length.
method the dependence measure; see Details for possible values.
weights an optional vector of weights for the observations.
remove_missing if TRUE, all (pairwise) incomplete observations are removed; if FALSE, the function throws an error if there are incomplete observations.
alternative indicates the alternative hypothesis and must be one of "two-sided", "greater" or "less". You can specify just the initial letter. "greater" corresponds to positive association, "less" to negative association.
Details

Available methods:

- "pearson": Pearson correlation
- "spearman": Spearman's $\rho$
- "kendall": Kendall's $\tau$
- "blomqvist": Blomqvist's $\beta$
- "hoeffding": Hoeffding's $D$

Partial matching of method names is enabled. All methods except "hoeffding" work with discrete variables.

Examples

```r
x <- rnorm(100)
y <- rpois(100, 1) # all but Hoeffding's D can handle ties
w <- runif(100)

indep_test(x, y, method = "kendall") # unweighted
indep_test(x, y, method = "kendall", weights = w) # weighted
```

---

### rank_wtd Computing weighted ranks

Description

The weighted rank of $X_i$ among $X_1, \ldots, X_n$ with weights $w_1, \ldots, w_n$ is defined as

$$\frac{1}{n} \sum_{j=1}^{n} w_j 1[X_j \leq X_i].$$

Usage

```r
rank_wtd(x, weights = numeric(), ties_method = "average")
```

Arguments

- `x` a numeric vector.
- `weights` a vector of weights (same length as `x`).

Value

a vector of ranks.
Examples

```r
x <- rnorm(100)
w <- rexp(100)
r ank(x)
r ank_wtd(x, w)
```

---

**wdm**  
*Weighted Dependence Measures*

**Description**

Computes a (possibly weighted) dependence measure between `x` and `y` if these are vectors. If `x` and `y` are matrices then the measure between the columns of `x` and the columns of `y` are computed.

**Usage**

```r
wdm(x, y = NULL, method = "pearson", weights = NULL, remove_missing = TRUE)
```

**Arguments**

- `x`: a numeric vector, matrix or data frame.
- `y`: NULL (default) or a vector, matrix or data frame with compatible dimensions to `x`. The default is equivalent to `y = x` (but more efficient).
- `method`: the dependence measure; see Details for possible values.
- `weights`: an optional vector of weights for the observations.
- `remove_missing`: if TRUE, all (pairwise) incomplete observations are removed; if FALSE, the function throws an error if there are incomplete observations.

**Details**

Available methods:

- "pearson": Pearson correlation
- "spearman": Spearman’s \( \rho \)
- "kendall": Kendall’s \( \tau \)
- "blomqvist": Blomqvist’s \( \beta \)
- "hoeffding": Hoeffding’s \( D \) Partial matching of method names is enabled.

Spearman’s \( \rho \) and Kendall’s \( \tau \) are corrected for ties if there are any.
Examples

```r
## dependence between two vectors
x <- rnorm(100)
y <- rpois(100, 1) # all but Hoeffding's D can handle ties
w <- runif(100)
wdm(x, y, method = "kendall") # unweighted
wdm(x, y, method = "kendall", weights = w) # weighted

## dependence in a matrix
x <- matrix(rnorm(100 * 3), 100, 3)
wdm(x, method = "spearman") # unweighted
wdm(x, method = "spearman", weights = w) # weighted

## dependence between columns of two matrices
y <- matrix(rnorm(100 * 2), 100, 2)
wdm(x, y, method = "hoeffding") # unweighted
wdm(x, y, method = "hoeffding", weights = w) # weighted
```
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