Package 'nonparTrendR'

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Type Package

Title A Nonparametric Trend Test for Independent and Dependent Samples

Version 0.1.0

Description Implements the nonparametric trend test for one or several samples as proposed by Bathke (2009) <doi:10.1007/s00184-008-0171-x>. The method provides a unified framework for analyzing trends in both independent and dependent data samples, making it a versatile tool for various study designs. The package allows for the evaluation of different trend alternatives, including two-sided (general trend), monotonic increasing, and monotonic decreasing trends. As a nonparametric procedure, it does not require the assumption of data normality, offering a robust alternative to parametric tests.

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Encoding UTF-8

Depends R (>= 3.5.0)

Imports stats

Suggests testthat

RoxygenNote 7.3.2

NeedsCompilation no

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`nonparTrendR_test` *Nonparametric Trend Test (Bathke, 2009)*

Description

Performs a nonparametric trend test for independent or dependent samples based on Bathke (2009).

Usage

```
nonparTrendR_test(data, type = c("I", "D"), alternative = NULL)
```

Arguments

`data`	For ‘type = "I"‘ (independent samples), a list of numeric vectors, where each vector represents a group. For ‘type = "D"‘ (dependent samples), a numeric matrix where rows are subjects and columns are conditions/time points (ordered by the expected trend).
`type`	A character string specifying the type of data: ‘"I"‘ for independent samples (uses Formula 2 from Bathke, 2009). ‘"D"‘ for dependent samples (uses Formula 4 from Bathke, 2009, for an increasing trend).
`alternative`	A character string specifying the alternative hypothesis, must be one of ‘"two.sided"‘ (default for independent), ‘"increasing"‘ (default for dependent), or ‘"decreasing"‘.

Value

A list with class ‘"htest"‘ containing the following components:

`statistic`	The value of the test statistic (ν).
`p.value`	The p-value for the test.
`alternative`	A character string describing the alternative hypothesis.
`method`	A character string indicating the type of test performed.
`data.name`	A character string giving the name(s) of the data.

References

Bathke, A. C. (2009). A unified approach to nonparametric trend tests for dependent and independent samples. *Metrika*, 69(1), 17-29.

Examples

```
# --- Independent Samples Example (Table 2 from paper) ---
group1_indep <- c(6.62, 6.65, 5.78, 5.63, 6.05, 6.48, 5.50, 5.37)
group2_indep <- c(6.25, 6.95, 5.61, 5.40, 6.89, 6.24, 5.85)
group3_indep <- c(7.11, 5.68, 6.23, 7.11, 5.55, 5.90, 5.98, 7.14)
group4_indep <- c(6.93, 7.17, 7.12, 6.43, 6.96, 7.08, 7.93)
group5_indep <- c(7.26, 6.45, 6.37, 6.54, 6.93, 6.40, 7.01, 7.74, 7.63, 7.62, 7.38)
```

```
data_independent <- list(group1_indep, group2_indep, group3_indep, group4_indep, group5_indep)
nonparTrendR_test(data_independent, type = "I", alternative = "increasing")

# --- Dependent Samples Example (Panic Data from paper) ---
panic_data_dep <- matrix(c(
  8, 6, 5, 5, 4,  8, 6, 5, 4, 2,  6, 5, 5, 4, 2,  6, 6, 6, 5, 5,
  7, 6, 6, 6, 6,  8, 7, 3, 2, 2,  7, 6, 7, 3, 3,  6, 4, 5, 3, 3,
  5, 4, 3, 3, 2,  8, 6, 5, 5, 4,  7, 6, 5, 4, 2,  6, 5, 5, 4, 2,
  6, 6, 6, 5, 5,  8, 6, 6, 6, 6,  8, 7, 4, 2, 2,  7, 6, 7, 3, 3
), nrow = 16, byrow = TRUE)
# For increasing trend test, data should be ordered such that higher values are expected later.
# If testing for decreasing trend as in your example,
# reverse the columns or use alternative="decreasing"
# Example using original order, testing for decreasing:
nonparTrendR_test(panic_data_dep, type = "D", alternative = "decreasing")
# Example reversing columns to test for increasing trend of "improvement"
nonparTrendR_test(panic_data_dep[, 5:1], type = "D", alternative = "increasing")
```

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