Package ‘ffaframework’

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Title Flood Frequency Analysis Framework

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Description Tools for exploratory data analysis and flood frequency analysis using L-moments, statistical tests, and model assessment. Implements several methods for distribution selection, trend detection, and uncertainty quantification.

Encoding UTF-8

LazyData true

Imports lmom, parallel, stats, graphics, utils, ggplot2, aTSA, randtests

Suggests testthat, covr

Roxygen list(markdown = TRUE)

RoxygenNote 7.3.2

Contents

`mk.test` *Mann–Kendall Test for Monotonic Trends*

Description

Performs the Mann–Kendall trend test on a numeric vector to detect the presence of a monotonic trend (increasing or decreasing) over time. The test is non-parametric and accounts for tied observations in the data.

Usage

```
mk.test(data, alpha = 0.05, quiet = TRUE)
```

Arguments

`data`	A numeric vector of AMS values or their variances. Must not contain NA values.
`alpha`	A numeric value specifying the significance level (default is 0.05).
`quiet`	Logical. If FALSE, prints a summary of the test result to the console.

Details

The statistic \(S\) is computed as the sum over all pairs \(i < j\) of the sign of the difference \(x_j - x_i\). Ties are explicitly accounted for when calculating the variance of \(S\), using grouped frequencies of tied observations.

The test statistic \(Z\) is then computed based on the sign and magnitude of \(S\), and the p-value is derived from the standard normal distribution.

Value

A named list with the following components:

s.statistic The raw Mann–Kendall test statistic \(S\).

s.variance The variance of the test statistic under the null hypothesis.

p.value The p-value associated with the two-sided hypothesis test.

reject Logical. TRUE if the null hypothesis of no trend is rejected at `alpha`.

See Also

`bbmk_test` for a bootstrap-based variant of this test.

Index