Package ‘SlidingWindows’
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nent), GUEDES et al. (2019) <doi:10.1016/j.physa.2019.04.132>, Detrended cross-
correlation coefficient (RHOD-
correlation coefficient and Detrended multiple cross-correlation coeffi-
cient (DMC), GUEDES & SILVA-
dows approach.

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### Description

This function generates descriptive statistics of a univariate time series with sliding windows approach.

### Usage

```r
descritive.SlidingWindows(y, w = 99, skewness = "moment", kurtosis = "moment")
```

### Arguments

- `y`  
  A vector containing univariate time series.

- `w`  
  An integer value indicating the window size \( w < \text{length}(y) \). If \( w = \text{length}(y) \), will be computed the function will not slide.

- `skewness`  
  A non-numeric value. See PerformanceAnalytics package.

- `kurtosis`  
  A non-numeric value. See PerformanceAnalytics package.

### Details

This function include following measures: min, max, mean, median, standard deviation, skewness and kurtosis.

### Value

A list containing "w", "min","max","mean", "median", "standard deviation","skewness" and "kurtosis".

### References

**Examples**

```r
y <- rnorm(100)
descriptive.SlidingWindows(y, w=99, skewness="moment", kurtosis="moment")
```

---

**Description**

This function generates scaling exponents (long-range correlations) of a univariate time series with sliding windows approach.

**Usage**

```r
dfa.SlidingWindows(y, w = 98, k = 10, npoints = 15)
```

**Arguments**

- `y`: A vector containing univariate time series.
- `w`: An integer value indicating the window size `w < length(y)`. If `w = length(y)`, will be computed the function will not slide.
- `k`: An integer value indicating the boundary of the division `(N/k)`. The smallest value of `k` is 4.
- `npoints`: The number of different time scales that will be used to estimate the Fluctuation function in each zone. See nonlinearTseries package.

**Details**

This function include following measures: alpha_dfa, se_alpha_dfa, r2_alpha_dfa.

**Value**

A list containing "w", "alpha_dfa", "se_alpha_dfa", "r2_alpha_dfa".

**References**


dmc.SlidingWindows

Examples

```
y <- rnorm(100)
dfa.SlidingWindows(y, w=99, k=10, npoints=15)
```

---

### dmc.SlidingWindows

**Detrended multiple cross-correlation coefficient with sliding windows.**

### Description

This function generates DMC Coefficient of three time series with sliding windows approach.

### Usage

```
dmc.SlidingWindows(x1, x2, y, w = 98, k = 10, method = "rhodcca", nu = 0)
```

### Arguments

- **x1**: A vector containing univariate time series.
- **x2**: A vector containing univariate time series.
- **y**: A vector containing univariate time series.
- **w**: An integer value indicating the window size \( w < \text{length}(y) \). If \( w = \text{length}(y) \), the function will not slide.
- **k**: An integer value indicating the boundary of the division \( N/k \). The smallest value of \( k \) is 4.
- **method**: A character string indicating which correlation coefficient is to be used. If method = "rhodcca" (default) the dmc coefficient is generated from the DCCA coefficient. If method = "dmca", the dmc coefficient is generated from the DMCA coefficient.
- **nu**: An integer value. See the DCCA package.

### Details

This function include following measures: \( w \), timescale, dmc and cross-correlation between: \( yx1 \), \( yx2 \), \( x1x2 \)

### Value

A list containing "w", "dmc", "yx1", "yx2", "x1x2".

### References


dmca.SlidingWindows

Examples

```r
x1 <- rnorm(100)
x2 <- rnorm(100)
y <- rnorm(100)
dmc.SlidingWindows(x1,x2,y,w=99,k=10,nu=0, method="rhodcca")
dmc.SlidingWindows(x1,x2,y,w=99,k=10,nu=0, method="dmca")
```

---

**dmca.SlidingWindows**  
DMCA coefficient with sliding windows.

**Description**

This function generates Detrending moving-average cross-correlation coefficient of two time series with sliding windows approach.

**Usage**

```r
dmca.SlidingWindows(x, y, w = 98, k = 10)
```

**Arguments**

- `x`: A vector containing univariate time series.
- `y`: A vector containing univariate time series.
- `w`: An integer value indicating the window size \( w < \text{length}(y) \). If \( w = \text{length}(y) \), the function will not slide.
- `k`: An integer value indicating the boundary of the division \( (N/k) \). The smallest value of \( k \) is 4.

**Details**

This function includes the following measures: \( w \), timescale, dmca

**Value**

A list containing "w", "timescale", "dmca".

**References**


**Examples**

```r
x <- rnorm(100)
y <- rnorm(100)
dmca.SlidingWindows(x,y,w=99,k=10)
```
Approximate entropy with sliding windows.

Description

This function computes approximate entropy of a univariate time series with sliding windows approach.

Usage

```r
entropy.SlidingWindows(y, w = 99, k = 4, dim = 2, r = 0.5, lag = 1)
```

Arguments

- `y`: A vector containing univariate time series.
- `w`: An integer value indicating the window size \( w < \text{length}(y) \). If \( w = \text{length}(y) \), will be computed the function will not slide.
- `k`: An integer value indicating the boundary of the division \( N/k \). The smallest value of \( k \) is 4.
- `dim`: The dimension of given time series. See TSEntropies package.
- `r`: The radius of searched areas. See TSEntropies package.
- `lag`: The downsampling. See TSEntropies package.

Details

This function return the list with time series sliding windows.

Value

A list containing "w", "ApEn", "FastApEn".

References


Examples

```r
y <- rnorm(100)
entropy.SlidingWindows(y, w=99, k=4, dim=2, r=.2, lag=1)
```
rhodcca.SlidingWindows

**Detrended Cross-Correlation Coefficient with sliding windows.**

**Description**

This function generates Detrended Cross-Correlation Coefficient of two time series with sliding windows approach.

**Usage**

```
rhodcca.SlidingWindows(x, y, w = 98, k = 10, nu = 0)
```

**Arguments**

- `x`: A vector containing univariate time series.
- `y`: A vector containing univariate time series.
- `w`: An integer value indicating the window size \( w < \text{length}(y) \). If \( w = \text{length}(y) \), will be computed the function will not slide.
- `k`: An integer value indicating the boundary of the division \( N/k \). The smallest value of \( k \) is 4.
- `nu`: An integer value. See DCCA package.

**Details**

This function include following measures:

- \( w \), timescale, rhodcca

**Value**

A list containing "w", "timescale", "rhodcca".

**References**


**Examples**

```
x <- rnorm(100)
y <- rnorm(100)
rhodcca.SlidingWindows(x, y, w=99, k=10, nu=0)
```
SlidingWindows

Description
This function generates sliding windows approach of a time series.

Usage
SlidingWindows(y, w = 99)

Arguments
y A vector containing univariate time series.
w An integer value indicating the window size $w < \text{length}(y)$. If $w = \text{length}(y)$, will be computed the function will not slide.

Details
This function return the matrix with time series sliding windows.

Value
A list containing "w", "SlidingWindows".

References

Examples
y <- rnorm(100)
SlidingWindows(y,w=99)
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