Package 'tbrf'

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Type Package

Title Time-Based Rolling Functions

Version 0.1.6

Description Provides rolling statistical functions based
on date and time windows instead of n-lagged observations.

URL https://mps9506.github.io/tbrf/

BugReports https://github.com/mps9506/tbrf/issues

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Encoding UTF-8

LazyData true

RoxygenNote 7.3.1

Depends R (>= 2.10)

Imports boot, dplyr, lubridate, purrr, rlang, tibble, tidyr

Suggests spelling, covr, ggalt, ggplot2, testthat, knitr, rmarkdown

VignetteBuilder knitr

Language en-US

Config/Needs/website mps9506/mpsTemplates

NeedsCompilation no

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Repository CRAN

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Contents

`Dissolved_Oxygen` *Dissolved oxygen measurements from the Tres Palacios rivers*

Description

Data from the Texas Commission on Environmental Quality Surface Water Quality Monitoring Information System. The 'AverageDO" field is the mean of dissolved oxygen concentrations (mg/L) measured at a field site at that day. The MinDO is the minimum dissolved oxygen concentration measured at that site on that day.

Usage

```
data(Dissolved_Oxygen)
```

Format

A data frame with 236 rows and 6 variables:

Station_ID unique water quality monitoring station identifier

Date sampling date in yyyy-mm-dd format

Param_Code unique parameter code

Param_Desc parameter description with units

Average_DO mean of dissolved oxygen measurement, in mg/L

Min_DO minimum of dissolved oxygen measurement, in mg/L

Source

https://www80.tceq.texas.gov/SwqmisPublic/public/default.htm

tbr_binom *Time-Based Rolling Binomial Probability*

Description

Produces a a rolling time-window based vector of binomial probability and confidence intervals.

Usage

```
tbr_binom(.tbl, x, tcolumn, unit = "years", n, alpha = 0.05)
```

Arguments

.tbl	dataframe with two variables.
x	indicates the variable column containing "success" and "failure" observations coded as 1 or 0.
tcolumn	indicates the variable column containing Date or Date-Time values.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window in the selected units.
alpha	numeric, probability of a type 1 error, so confidence coefficient = 1-alpha

Value

tibble with binomial point estimate and confidence intervals.

See Also

binom_ci

Examples

```
## Generate Sample Data
df <- tibble::tibble(
date = sample(seq(as.Date('2000-01-01'), as.Date('2015/12/30'), by = "day"), 100),
value = rbinom(100, 1, 0.25)
)

## Run Function
tbr_binom(df, x = value,
tcolumn = date, unit = "years", n = 5,
alpha = 0.1)
```

tbr_gmean *Time-Based Rolling Geometric Mean*

Description

Produces a a rolling time-window based vector of geometric means and confidence intervals.

Usage

```
tbr_gmean(.tbl, x, tcolumn, unit = "years", n, ...)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the values to calculate the geometric mean.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
...	additional arguments passed to gm_mean_ci

Value

tibble with columns for the rolling geometric mean and upper and lower confidence levels.

See Also

gm_mean_ci

Examples

```
## Return a tibble with new rolling geometric mean column
tbr_gmean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)

## Not run:
## Return a tibble with rolling geometric mean and 95% CI
tbr_gmean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```

tbr_mean *Time-Based Rolling Mean*

Description

Produces a a rolling time-window based vector of means and confidence intervals.

Usage

```
tbr_mean(.tbl, x, tcolumn, unit = "years", n, ...)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the numeric values to calculate the mean.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
...	additional arguments passed to mean_ci.

Value

tibble with columns for the rolling mean and upper and lower confidence intervals.

See Also

mean_ci

Examples

```
## Return a tibble with new rolling mean column
tbr_mean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)

## Not run:
## Return a tibble with rolling mean and 95% CI
tbr_mean(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```

tbr_median *Time-Based Rolling Median*

Description

Produces a a rolling time-window based vector of medians and confidence intervals.

Usage

```
tbr_median(.tbl, x, tcolumn, unit = "years", n, ...)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the numeric values to calculate the mean.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
...	additional arguments passed to median_ci

Value

tibble with columns for the rolling median and upper and lower confidence intervals.

See Also

median_ci

Examples

```
## Return a tibble with new rolling median column
tbr_median(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years",
n = 5)

## Not run:
## Return a tibble with rolling median and 95% CI
tbr_median(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, conf = .95)
## End(Not run)
```

tbr_misc *Use Generic Functions with Time Windows*

Description

Use Generic Functions with Time Windows

Usage

```
tbr_misc(.tbl, x, tcolumn, unit = "years", n, func, ...)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the values the function is applied to.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
func	specified function
...	optional additional arguments passed to function func

Value

tibble

Examples

```
tbr_misc(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5, func = mean)
```

tbr_sd *Time-Based Rolling Standard Deviation*

Description

Time-Based Rolling Standard Deviation

Usage

```
tbr_sd(.tbl, x, tcolumn, unit = "years", n, na.rm = FALSE)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the values to calculate the standard deviation.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
na.rm	logical. Should missing values be removed?

Value

tibble with column for the rolling sd.

See Also

sd

Examples

```
tbr_sd(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n = 5)
```

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tbr_sum *Time-Based Rolling Sum*

Description

Time-Based Rolling Sum

Usage

```
tbr_sum(.tbl, x, tcolumn, unit = "years", n, na.rm = FALSE)
```

Arguments

.tbl	a data frame with at least two variables; time column formatted as date, date/time and value column.
x	column containing the values to calculate the sum.
tcolumn	formatted time column.
unit	character, one of "years", "months", "weeks", "days", "hours", "minutes", "seconds"
n	numeric, describing the length of the time window.
na.rm	logical. Should missing values be removed?

Value

dataframe with column for the rolling sum.

See Also

sum

Examples

```
tbr_sum(Dissolved_Oxygen, x = Average_DO, tcolumn = Date, unit = "years", n =
5)
```

Index