Package ‘tbrf’

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Type  Package
Title  Time-Based Rolling Functions
Version  0.1.5
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Description  Provides rolling statistical functions based
on date and time windows instead of n-lagged observations.

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

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

**Usage**

```r
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**

```r
## 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 rolling time-window based vector of geometric means and confidence intervals.

Usage

```r
  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

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

See Also

- `gm_mean_ci`

Examples

```r
  # 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 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**

```r
## 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
## Not run:
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 rolling time-window based vector of medians and confidence intervals.

**Usage**

```r
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**

```r
## 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)
tbr_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

tibble with column for the rolling sd.

See Also

sd

Examples

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

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)
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