Package 'grates'

August 29, 2024

Title Grouped Date Classes

Version 1.2.2

Description Provides a coherent interface and implementation for creating grouped date classes. This package is part of the RECON (<https://www.repidemicsconsortium.org/>) toolkit for outbreak analysis.

URL https://www.reconverse.org/grates/, https://github.com/reconverse/grates

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Encoding UTF-8

RoxygenNote 7.3.2

Depends R (>= 3.6.0)

Suggests knitr, ggplot2, scales, vctrs, rlang, markdown, outbreaks, testthat (>= 3.0.0),

VignetteBuilder knitr

Config/testthat/edition 3

Imports utils

NeedsCompilation no

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Repository CRAN

Date/Publication 2024-08-29 16:30:02 UTC

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`as_epiweek` *Coerce to a epiweek object*

Description

Generic for conversion to `<grates_epiweek>`

Usage

```
as_epiweek(x, ...)

## Default S3 method:
as_epiweek(x, ...)

## S3 method for class 'Date'
```

```
as_epiweek(x, ...)

## S3 method for class 'POSIXt'
as_epiweek(x, ...)

## S3 method for class 'character'
as_epiweek(x, format, tryFormats = c("%Y-%m-%d", "%Y/%m/%d"), ...)

## S3 method for class 'factor'
as_epiweek(x, format, tryFormats = c("%Y-%m-%d", "%Y/%m/%d"), ...)
```

Arguments

x	R object.
...	Other values passed to as.Date().
format	[character] Passed to as.Date() unless format = "yearweek" in which case input is assumed to be in the form "YYYY-Wxx". If not specified, it will try tryFormats one by one on the first non-NA element, and give an error if none works. Otherwise, the processing is via strptime() whose help page describes available conversion specifications.
tryFormats	[character] Format strings to try if format is not specified.

Details

- Date, POSIXct, and POSIXlt are converted with the timezone respected.
- Character objects are first coerced to date via as.Date() unless format = "yearweek" in which case input is assumed to be in the form "YYYY-Wxx" and parsed accordingly.

Value

A <grates_epiweek> object.

See Also

new_epiweek() and as.Date().

Examples

```
as_epiweek(Sys.Date())
as_epiweek(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"))
as_epiweek("2019-05-03")
as_epiweek("2019-W12", format = "yearweek")
```

`as_isoweek` *Coerce to a isoweek object*

Description

Generic for conversion to `<grates_isoweek>`

Usage

```
as_isoweek(x, ...)

## Default S3 method:
as_isoweek(x, ...)

## S3 method for class 'Date'
as_isoweek(x, ...)

## S3 method for class 'POSIXt'
as_isoweek(x, ...)

## S3 method for class 'character'
as_isoweek(x, format, tryFormats = c("%Y-%m-%d", "%Y/%m/%d"), ...)

## S3 method for class 'factor'
as_isoweek(x, format, tryFormats = c("%Y-%m-%d", "%Y/%m/%d"), ...)
```

Arguments

`x`	R object.
`...`	Other values passed to as.Date().
`format`	`[character]`
	Passed to as.Date() unless `format = "yearweek"` in which case input is assumed to be in the form "YYYY-Wxx".
	If not specified, it will try tryFormats one by one on the first non-NA element, and give an error if none works. Otherwise, the processing is via `strptime()` whose help page describes available conversion specifications.
`tryFormats`	`[character]`
	Format strings to try if format is not specified.

Details

- Date, POSIXct, and POSIXlt are converted with the timezone respected.
- Character objects are first coerced to date via `as.Date()` unless `format = "yearweek"` in which case input is assumed to be in the form "YYYY-Wxx" and parsed accordingly.

Value

A <grates_isoweek> object.

See Also

new_isoweek() and as.Date().

Examples

```
as_isoweek(Sys.Date())
as_isoweek(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"))
as_isoweek("2019-05-03")
as_isoweek("2019-W12", format = "yearweek")
```

---

as_month *Coerce an object to month*

Description

as_month() is a generic for coercing input in to <grates_month>.

Usage

```
as_month(x, n, ...)

## Default S3 method:
as_month(x, n, ...)

## S3 method for class 'Date'
as_month(x, n, ...)

## S3 method for class 'POSIXt'
as_month(x, n, ...)

## S3 method for class 'character'
as_month(x, n, ...)

## S3 method for class 'factor'
as_month(x, n, ...)
```

Arguments

x	An R object. Character input is first parsed using as.Date(). POSIXt inputs are converted with the timezone respected.

n	[integer] Number of months that are being grouped. Must be greater than 1 (use as_yearmonth() for this case).
...	Only used For character input where additional arguments are passed through to as.Date().

Value

A <grates_month> object.

Note

Internally grates_month objects are stored as the position, starting at 0, of n-month groups since the Unix Epoch (1970-01-01). Here n-months is taken to mean a 'grouping of n consecutive months'. Precision is only to the month level (i.e. the day of the month is always dropped).

References

The algorithm to convert between dates and months relative to the UNIX Epoch comes from the work of Davis Vaughan in the unreleased datea package.

See Also

as.Date()

Examples

```
as_month("2019-05-03", n = 4L)
as_month(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"), n = 2)
```

---

as_period *Coerce an object to period*

Description

as_period() is a generic for coercing input in to <grates_period>.

Usage

```
as_period(x, n, ...)

## Default S3 method:
as_period(x, n = 1L, offset = 0L, ...)

## S3 method for class 'Date'
as_period(x, n = 1L, offset = 0L, ...)
```

```
## S3 method for class 'POSIXt'
as_period(x, n = 1L, offset = 0L, ...)

## S3 method for class 'character'
as_period(x, n = 1L, offset = 0L, ...)

## S3 method for class 'factor'
as_period(x, n = 1L, offset = 0L, ...)
```

Arguments

x	An R object: • Character input is first parsed using `as.Date()`. • POSIXt inputs are converted with the timezone respected.
n	`[integer]` Number of days that are being grouped.
...	Only used For character input where additional arguments are passed through to `as.Date()`.
offset	`[integer]` or `[date]` Value you wish to start counting periods from relative to the Unix Epoch: • For integer values this is stored scaled by n (`offset <- as.integer(offset) %% n`). • For date values this is first converted to an integer offset (`offset <- floor(as.numeric(offset))`) and then scaled via n as above.

Value

A <grates_period> object.

Note

Internally grates_period objects are stored as the integer number, starting at 0L, of periods since the Unix Epoch (1970-01-01) and a specified offset. Here periods are taken to mean groupings of n consecutive days.

See Also

`as.Date()`

Examples

```
as_period("2019-05-03")
as_period("2019-05-03", n = 2, offset = 1)
as_period(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"), n = 10)
as_period(as.Date("2020-03-02"), n = 2L, offset = as.Date("2020-03-01"))
```

as_year *Coerce an object to year-quarter*

Description

as_year() is a generic for coercing input in to <grates_year>.

Usage

```
as_year(x, ...)

## Default S3 method:
as_year(x, ...)

## S3 method for class 'Date'
as_year(x, ...)

## S3 method for class 'POSIXt'
as_year(x, ...)

## S3 method for class 'character'
as_year(x, ...)

## S3 method for class 'factor'
as_year(x, ...)
```

Arguments

x	R object. Character input is first parsed using as.Date(). POSIXct and POSIXlt are converted with the timezone respected.
...	Only used For character input where additional arguments are passed through to as.Date().

Value

A <grates_year> object.

See Also

as.Date()

Examples

```
as_year(Sys.Date())
as_year(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"), interval = 2)
as_year("2019-05-03")
```

`as_yearmonth` *Coerce an object to year-month*

Description

`as_yearmonth()` is a generic for coercing input in to `<grates_yearmonth>`. Character input is first parsed using `as.Date()`. POSIXct and POSIXlt are all converted, with the timezone respected.

Usage

```
as_yearmonth(x, ...)

## Default S3 method:
as_yearmonth(x, ...)

## S3 method for class 'Date'
as_yearmonth(x, ...)

## S3 method for class 'POSIXt'
as_yearmonth(x, ...)

## S3 method for class 'character'
as_yearmonth(x, ...)

## S3 method for class 'factor'
as_yearmonth(x, ...)
```

Arguments

`x`	R object.
`...`	Only used For character input where additional arguments are passed through to `as.Date()`.

Value

A `<grates_yearmonth>` object.

Note

Internally `<grates_yearmonth>` objects are stored as the number of months (starting at 0) since the Unix Epoch (1970-01-01). Precision is only to the month level (i.e. the day of the month is always dropped).

References

The algorithm to convert between dates and months relative to the UNIX Epoch comes from the work of Davis Vaughan in the unreleased datea package.

See Also

`as.Date()`

Examples

```
as_yearmonth(Sys.Date())
as_yearmonth(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"), interval = 2)
as_yearmonth("2019-05-03")
```

`as_yearquarter` *Coerce an object to year-quarter*

Description

`as_yearquarter()` is a generic for coercing input in to `<grates_yearquarter>`. Character input is first parsed using `as.Date()`. POSIXct and POSIXlt are all converted, with the timezone respected.

Usage

```
as_yearquarter(x, ...)

## Default S3 method:
as_yearquarter(x, ...)

## S3 method for class 'Date'
as_yearquarter(x, ...)

## S3 method for class 'POSIXt'
as_yearquarter(x, ...)

## S3 method for class 'character'
as_yearquarter(x, ...)

## S3 method for class 'factor'
as_yearquarter(x, ...)
```

Arguments

`x`	R object
`...`	Only used For character input where additional arguments are passed through to `as.Date()`.

Value

A `<grates_yearquarter>` object.

Note

Internally <grates_yearquarter> objects are stored as the number of quarters (starting at 0) since the Unix Epoch (1970-01-01).

See Also

`as.Date()`

Examples

```
as_yearquarter(Sys.Date())
as_yearquarter(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"), interval = 2)
as_yearquarter("2019-05-03")
```

---

as_yearweek *Coerce to a yearweek object*

Description

Generic for conversion to <grates_yearweek>.

Usage

```
as_yearweek(x, ...)

## Default S3 method:
as_yearweek(x, ...)

## S3 method for class 'Date'
as_yearweek(x, firstday = 1L, ...)

## S3 method for class 'POSIXt'
as_yearweek(x, firstday = 1L, ...)

## S3 method for class 'character'
as_yearweek(
  x,
  firstday = 1L,
  format,
  tryFormats = c("%Y-%m-%d", "%Y/%m/%d"),
  ...
)

## S3 method for class 'factor'
as_yearweek(
  x,
```

```
  firstday = 1L,
  format,
  tryFormats = c("%Y-%m-%d", "%Y/%m/%d"),
  ...
)
```

Arguments

x	R object.
...	Other values passed to as.Date().
firstday	[integer]
	The day the week starts on from 1 (Monday) to 7 (Sunday).
format	[character]
	Passed to as.Date() unless format = "yearweek" in which case input is assumed to be in the form "YYYY-Wxx".
	If not specified, it will try tryFormats one by one on the first non-NA element, and give an error if none works. Otherwise, the processing is via strptime() whose help page describes available conversion specifications.
tryFormats	[character]
	Format strings to try if format is not specified.

Details

- Date, POSIXct, and POSIXlt are converted with the timezone respected.
- Character objects are first coerced to date via as.Date() unless format = "yearweek" in which case input is assumed to be in the form "YYYY-Wxx" and parsed accordingly.

Value

A <grates_yearweek> object.

See Also

as.Date() and new_yearweek().

Examples

```
as_yearweek(Sys.Date())
as_yearweek(as.POSIXct("2019-03-04 01:01:01", tz = "America/New_York"))
as_yearweek("2019-05-03", firstday = 5L)
as_yearweek("2019-W12", format = "yearweek")
```

boundaries *Access the start (end) dates of a grates vector*

Description

Utility functions for accessing the start (end) dates for each element of a grates object and also checking whether a date is contained within that range

Usage

```
date_start(x)

date_end(x)

date %during% x
```

Arguments

x	grouped date vector.
date	A scalar <date> object.

Value

For date_start and date_end The requested start (end) dates for each element in the input. For %during% a logical vector indicating whether the date was present within the range of the tested object.

Examples

```
dates <- as.Date("2020-01-01") + 1:14

week <- as_isoweek(dates)
date_start(week)
date_end(week)
dates[1L] %during% week

period <- as_period(dates, n = 3)
date_start(period)
date_end(period)
dates[14L] %during% period
```

epiweek *Constructor for epiweek objects*

Description

epiweek() is a constructor for <grates_epiweek> objects.

Usage

```
epiweek(year = integer(), week = integer())
```

Arguments

year	[integer]
	Vector representing the year associated with week.
	double vectors will be converted via as.integer(floor(x)).
week	[integer]
	Vector representing the week associated with 'year.
	double vectors will be converted via as.integer(floor(x)).

Details

Epiweeks are defined to start on a Sunday and <grates_epiweek> objects are stored as the number of weeks (starting at 0) from the first Sunday after the Unix Epoch (1970-01-01). That is, the number of seven day periods from 1970-01-04.

Internally they have the same representation as a <grates_yearweek_sunday> object so are akin to an alias but with a marginally more efficient implementation.

Value

A <grates_epiweek> object.

See Also

as_epiweek() and new_epiweek().

Examples

```
epiweek(year = 2000L, week = 3L)
```

grouped_date_accessors *Accessors for grate objects*

Description

Generics and methods for accessing information about grouped date objects.

Usage

```
get_firstday(x, ...)

## Default S3 method:
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_monday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_tuesday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_wednesday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_thursday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_friday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_saturday'
get_firstday(x, ...)

## S3 method for class 'grates_yearweek_sunday'
get_firstday(x, ...)

get_week(x, ...)

## Default S3 method:
get_week(x, ...)

## S3 method for class 'grates_yearweek'
get_week(x, ...)

## S3 method for class 'grates_epiweek'
get_week(x, ...)
```

```
## S3 method for class 'grates_isoweek'
get_week(x, ...)

get_year(x, ...)

## Default S3 method:
get_year(x, ...)

## S3 method for class 'grates_yearweek'
get_year(x, ...)

## S3 method for class 'grates_epiweek'
get_year(x, ...)

## S3 method for class 'grates_isoweek'
get_year(x, ...)

## S3 method for class 'grates_yearmonth'
get_year(x, ...)

## S3 method for class 'grates_yearquarter'
get_year(x, ...)

## S3 method for class 'grates_year'
get_year(x, ...)

get_n(x, ...)

## Default S3 method:
get_n(x, ...)

## S3 method for class 'grates_month'
get_n(x, ...)

## S3 method for class 'grates_period'
get_n(x, ...)

get_offset(x, ...)

## Default S3 method:
get_offset(x, ...)

## S3 method for class 'grates_period'
get_offset(x, ...)
```

Arguments

x	R object

... Not currently used

Value

Requested value or an error if no method available.

Examples

```
dates <- as.Date("2020-01-01") + 1:14
dat <- as_isoweek(dates)
get_week(dat)
get_year(dat)
```

---

isoweek *Constructor for isoweek objects*

Description

`isoweek()` is a constructor for `<grates_isoweek>` objects.

Usage

```
isoweek(year = integer(), week = integer())
```

Arguments

year	`[integer]` Vector representing the year associated with `week`. `double` vectors will be converted via `as.integer(floor(x))`.
week	`[integer]` Vector representing the week associated with 'year. `double` vectors will be converted via `as.integer(floor(x))`.

Details

isoweeks are defined to start on a Monday and `<grates_isoweek>` objects are stored as the number of weeks (starting at 0) from the first Monday prior to the Unix Epoch (1970-01-01). That is, the number of seven day periods from 1969-12-29.

Internally they have the same representation as a `<grates_yearweek_monday>` object so are akin to an alias but with a marginally more efficient implementation.

Value

A `<grates_isoweek>` object.

See Also

as_isoweek() and new_isoweek().

Examples

```
isoweek(year = 2000L, week = 3L)
```

---

new_epiweek *Minimal constructor for an epiweek object*

Description

new_epiweek() is a constructor for <grates_epiweek> objects aimed at developers.

Usage

```
new_epiweek(x = integer())

is_epiweek(xx)
```

Arguments

x	[integer] Vector representing the number of weeks. double vectors will be converted via as.integer(floor(x)).
xx	R object.

Details

Epiweeks are defined to start on a Sunday and <grates_epiweek> objects are stored as the number of weeks (starting at 0) from the first Sunday after the Unix Epoch (1970-01-01). That is, the number of seven day periods from 1970-01-04.

Internally they have the same representation as a <grates_yearweek_sunday> object so are akin to an alias but with a marginally more efficient implementation.

Value

A <grates_epiweek> object.

See Also

new_yearweek() and new_isoweek().

Examples

```
new_epiweek(1:10)
```

new_isoweek *Minimal constructor for an isoweek object*

Description

new_isoweek() is a constructor for <grates_isoweek> objects aimed at developers.

Usage

```
new_isoweek(x = integer())

is_isoweek(xx)
```

Arguments

x	[integer] Vector representing the number of weeks. double vectors will be converted via as.integer(floor(x)).
xx	R object.

Details

isoweeks are defined to start on a Monday and <grates_isoweek> objects are stored as the number of weeks (starting at 0) from the first Monday prior to the Unix Epoch (1970-01-01). That is, the number of seven day periods from 1969-12-29.

Internally they have the same representation as a <grates_yearweek_monday> object so are akin to an alias but with a marginally more efficient implementation.

Value

A <grates_isoweek> object.

See Also

new_yearweek() and new_epiweek().

Examples

```
new_isoweek(1:10)
```

new_month *Minimal Constructor for a month object*

Description

new_month() is a constructor for <grates_month> objects aimed at developers.

Usage

```
new_month(x = integer(), n)

is_month(xx)
```

Arguments

x	[integer] Vector representing the number of n-months since the Unix Epoch (1970-01-01). double vectors will be converted via as.integer(floor(x)).
n	[integer] Number of months that are being grouped. Must be greater than 1 (use yearmonth() for this case).
xx	R object.

Details

grates_month objects are stored as the integer number (starting at 0), of n-month groups since the Unix Epoch (1970-01-01). Here n-months is taken to mean a 'grouping of n consecutive months'.

Value

A <grates_month> object.

References

The algorithm to convert between dates and months relative to the UNIX Epoch comes from the work of Davis Vaughan in the unreleased datea package.

Examples

```
new_month(1:10, 2L)
```

new_period *Minimal constructor for a period object*

Description

new_period() is a constructor for <grates_period> objects aimed at developers.

Usage

```
new_period(x = integer(), n = 1L, offset = 0L)

is_period(xx)
```

Arguments

x	[integer] Vector representing the number of periods since the Unix Epoch (1970-01-01) and a specified offset. double vectors will be converted via as.integer(floor(x)).
n	[integer] Number of days that are being grouped by.
offset	[integer] Value you wish to start counting groups from relative to the Unix Epoch.
xx	R object.

Details

grates_period objects are stored as the integer number, starting at 0L, of periods since the Unix Epoch (1970-01-01) and a specified offset. Here periods are taken to mean groupings of n consecutive days.

For storage and calculation purposes, offset is scaled relative to n. I.e. offset <- offset %% n and values of x stored relative to this scaled offset.

Value

A <grates_period> object.

Examples

```
new_period(1:10)
```

new_yearmonth *Minimal constructor for a yearmonth object*

Description

new_yearmonth() is a constructor for <grates_yearmonth> objects aimed at developers.

Usage

```
new_yearmonth(x = integer())

is_yearmonth(xx)
```

Arguments

x	[integer] Vector representing the number of months. double vectors will be converted via as.integer(floor(x)).
xx	R object

Details

<grates_yearmonth> objects are stored as the number of months (starting at 0) since the Unix Epoch (1970-01-01). Precision is only to the month level (i.e. the day of the month is always dropped).

Value

A <grates_yearmonth> object.

References

The algorithm to convert between dates and months relative to the UNIX Epoch comes from the work of Davis Vaughan in the unreleased datea package

Examples

```
new_yearmonth(1:10)
```

new_yearquarter *Minimal constructor for a yearquarter object*

Description

`new_yearquarter()` is a constructor for `<grates_yearquarter>` objects aimed at developers.

Usage

```
new_yearquarter(x = integer())

is_yearquarter(xx)
```

Arguments

x	`[integer]` Vector representing the number of quarters. `double` vectors will be converted via `as.integer(floor(x))`.
xx	R object.

Details

`<yearquarter>` objects are stored as the number of quarters (starting at 0) since the Unix Epoch (1970-01-01).

Value

A `<grates_yearquarter>` object.

Examples

```
new_yearquarter(1:10)
```

new_yearweek *Minimal constructor for a yearweek object*

Description

`new_yearweek()` is a constructor for `<grates_yearweek>` objects aimed at developers.

Usage

```
new_yearweek(x = integer(), firstday = 1L)

is_yearweek(xx)
```

Arguments

x	[integer] Vector representing the number of weeks. double vectors will be converted via as.integer(floor(x)).
firstday	[integer] The day the week starts on from 1 (Monday) to 7 (Sunday).
xx	R object.

Details

<grates_yearweek> objects are stored as the number of weeks (starting at 0) from the date of the firstday nearest the Unix Epoch (1970-01-01). That is, the number of seven day periods from:

- 1969-12-29 for `firstday` equal to 1 (Monday)
- 1969-12-30 for `firstday` equal to 2 (Tuesday)
- 1969-12-31 for `firstday` equal to 3 (Wednesday)
- 1970-01-01 for `firstday` equal to 4 (Thursday)
- 1970-01-02 for `firstday` equal to 5 (Friday)
- 1970-01-03 for `firstday` equal to 6 (Saturday)
- 1970-01-04 for `firstday` equal to 7 (Sunday)

Value

A <grates_yearweek> object with subclass corresponding to the first day of the week they represent (e.g. <grates_yearweek_monday>).

See Also

as_yearweek(), new_isoweek() and new_epiweek().

Examples

```
new_yearweek(1:10)
```

---

print.grates_month *Print a month object*

Description

Print a month object

Usage

```
## S3 method for class 'grates_month'
print(x, format = "%Y-%b", sep = "to", ...)

## S3 method for class 'grates_month'
format(x, format = "%Y-%b", sep = "to", ...)
```

Arguments

x	A <grates_month> object.
format	[character]
	The format to use for the bounds of each value.
sep	[character]
	Where more than one month is grouped with others, sep is placed between the upper and lower bounds when printing.
...	Not currently used.

---

print.grates_period *Print a period object*

Description

Print a period object

Usage

```
## S3 method for class 'grates_period'
print(x, format = "%Y-%m-%d", sep = "to", ...)

## S3 method for class 'grates_period'
format(x, format = "%Y-%m-%d", sep = "to", ...)
```

Arguments

x	A <grates_period> object.
format	[character]
	The format to use for the bounds of each value.
sep	[character]
	Where more than one day is grouped with others, sep is placed between the upper and lower bounds when printing.
...	Not currently used.

print.grates_year *Print a year-quarter object*

Description

Print a year-quarter object

Usage

```
## S3 method for class 'grates_year'
print(x, ...)

## S3 method for class 'grates_year'
format(x, ...)
```

Arguments

x	A <grates_year> object.
...	Not currently used.

print.grates_yearmonth *Print a year-month object*

Description

Print a year-month object

Usage

```
## S3 method for class 'grates_yearmonth'
print(x, format = "%Y-%b", ...)

## S3 method for class 'grates_yearmonth'
format(x, format = "%Y-%b", ...)
```

Arguments

x	A <grates_yearmonth> object.
format	The format to use for printing.
...	Not currently used.

print.grates_yearquarter *Print a year-quarter object*

Description

Print a year-quarter object

Usage

```
## S3 method for class 'grates_yearquarter'
print(x, ...)

## S3 method for class 'grates_yearquarter'
format(x, ...)
```

Arguments

x	A <grates_yearquarter> object.
...	Not currently used.

scale_x_grates_epiweek *epiweek scale*

Description

ggplot2 scale for an <grates_epiweek> vector.

Usage

```
scale_x_grates_epiweek(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = NULL
)
```

Arguments

...	Not currently used.
breaks	A <grates_epiweek> vector of the desired breaks.

n.breaks	[integer] Approximate number of breaks calculated using scales::breaks_pretty (default 6L). Will only have an effect if breaks = waiver().
format	Format to use if "Date" scales are required. If NULL (default) then labels are in the standard yearweek format (YYYY-Www). If not NULL then the value is used by format.Date() and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

`scale_x_grates_isoweek` *isoweek scale*

Description

ggplot2 scale for an <grates_isoweek> vector.

Usage

```
scale_x_grates_isoweek(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = NULL
)
```

Arguments

...	Not currently used.
breaks	A <grates_isoweek> vector of the desired breaks.
n.breaks	[integer] Approximate number of breaks calculated using scales::breaks_pretty (default 6L). Will only have an effect if breaks = waiver().
format	Format to use if "Date" scales are required. If NULL (default) then labels are in the standard yearweek format (YYYY-Www). If not NULL then the value is used by format.Date() and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

`scale_x_grates_month` *month scale*

Description

ggplot2 scale for a month vector.

Usage

```
scale_x_grates_month(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = "%Y-%m-%d",
  bounds_format = "%Y-%b",
  sep = "to",
  n
)
```

Arguments

`...`	Not currently used.
`breaks`	A <grates_month> vector of the desired breaks.
`n.breaks`	`[integer]` Approximate number of breaks calculated using `scales::breaks_pretty` (default 6L). Will only have an effect if `breaks = waiver()`.
`format`	Format to use if "Date" scales are required. If NULL then labels are centralised and of the form "lower category bound to upper category bound". If not NULL then the value is used by `format.Date()` and can be any input acceptable by that function (defaults to "%Y-%m-%d).
`bounds_format`	Format to use for grouped date labels. Only used if `format` is NULL.
`sep`	`[character]` Separator to use for grouped date labels.
`n`	`[integer]` Number of months used for the original grouping.

Value

A scale for use with ggplot2.

`scale_x_grates_period` *period scale*

Description

ggplot2 scale for an <grates_period> vector.

Usage

```
scale_x_grates_period(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = "%Y-%m-%d",
  n,
  offset
)
```

Arguments

`...`	Not currently used.
`breaks`	A <grates_period> vector of the desired breaks.
`n.breaks`	[integer] Approximate number of breaks calculated using `scales::breaks_pretty` (default 6L). Will only have an effect if `breaks = waiver()`.
`format`	Format to use for dates. Value is used by `format.Date()` and can be any input acceptable by that function.
`n`	[integer] Number of days in each period.
`offset`	[integer] Number of days used in original grouping for the offset from the Unix Epoch.

Value

A scale for use with ggplot2.

scale_x_grates_year *year scale*

Description

ggplot2 scale for year vector.

Usage

```
scale_x_grates_year(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = NULL
)
```

Arguments

...	Not currently used.
breaks	A <grates_isoweek> vector of the desired breaks.
n.breaks	[integer] Approximate number of breaks calculated using scales::breaks_pretty (default 6L). Will only have an effect if breaks = waiver().
format	Format to use if "Date" scales are required. If not NULL then the value is used by format.Date() and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

scale_x_grates_yearmonth
yearmonth scale

Description

ggplot2 scale for a yearmonth vector.

Usage

```
scale_x_grates_yearmonth(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = NULL
)
```

Arguments

`...`	Not currently used.
`breaks`	A <grates_yearmonth> vector of the desired breaks.
`n.breaks`	[integer] Approximate number of breaks calculated using `scales::breaks_pretty` (default 6L). Will only have an effect if `breaks = waiver()`.
`format`	Format to use if "Date" scales are required. If not NULL then the value is used by `format.Date()` and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

---

scale_x_grates_yearquarter

yearquarter scale

Description

ggplot2 scale for a yearquarter vector.

Usage

```
scale_x_grates_yearquarter(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  format = NULL
)
```

Arguments

`...`	Not currently used.
`breaks`	A <grates_yearquarter> vector of the desired breaks.
`n.breaks`	[integer] Approximate number of breaks calculated using `scales::breaks_pretty` (default 6L). Will only have an effect if `breaks = waiver()`.
`format`	Format to use if "Date" scales are required. If not NULL then the value is used by `format.Date()` and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

`scale_x_grates_yearweek` *yearweek scale*

Description

ggplot2 scale for an <grates_yearweek> vector.

Usage

```
scale_x_grates_yearweek(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6L,
  firstday,
  format = NULL
)

scale_x_grates_yearweek_monday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_isoweek(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
```

```
)

scale_x_grates_yearweek_tuesday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_wednesday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_thursday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_friday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_saturday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_sunday(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
  format = NULL
)

scale_x_grates_yearweek_epiweek(
  ...,
  breaks = ggplot2::waiver(),
  n.breaks = 6,
```

```
  format = NULL
)
```

Arguments

`...`	Not currently used.
`breaks`	A <grates_yearweek> vector of the desired breaks.
`n.breaks`	[integer] Approximate number of breaks calculated using `scales::breaks_pretty` (default 6L). Will only have an effect if `breaks = waiver()`.
`firstday`	[integer] Integer value of the first weekday: 1 (Monday) to 7 (Sunday).
`format`	Format to use if "Date" scales are required. If NULL (default) then labels are in the standard yearweek format (YYYY-Www). If not NULL then the value is used by `format.Date()` and can be any input acceptable by that function.

Value

A scale for use with ggplot2.

---

year *Construct a year object*

Description

`year()` is a constructor for <grates_year> objects.

Usage

```
year(x = integer())

is_year(object)
```

Arguments

`x`	[integer] Vector representing the years. `double` vectors will be converted via `as.integer(floor(x))`.
`object`	R object.

Value

A <grates_year> object.

Examples

```
year(2011:2020)
```

`yearmonth` *Constructor for yearmonth objects*

Description

`yearmonth()` is a constructor for `<grates_yearmonth>` objects.

Usage

```
yearmonth(year = integer(), month = integer())
```

Arguments

`year`	`[integer]`
	Vector representing the year associated with `month`.
	`double` vectors will be converted via `as.integer(floor(x))`.
`month`	`[integer]`
	Vector representing the month associated with 'year.
	`double` vectors will be converted via `as.integer(floor(x))`.

Details

`<grates_yearmonth>` objects are stored as the number of months (starting at 0) since the Unix Epoch (1970-01-01).

Value

A `<grates_yearmonth>` object.

See Also

`as_yearmonth()` and `new_yearmonth()`.

Examples

```
yearmonth(year = 2000L, month = 3L)
```

yearquarter *Constructor for yearquarter objects*

Description

`yearquarter()` is a constructor for `<grates_yearquarter>` objects.

Usage

```
yearquarter(year = integer(), quarter = integer())
```

Arguments

year	`[integer]`
	Vector representing the year associated with `quarter`.
	`double` vectors will be converted via `as.integer(floor(x))`.
quarter	`[integer]`
	Vector representing the quarter associated with 'year.
	`double` vectors will be converted via `as.integer(floor(x))`.

Details

`<grates_yearquarter>` objects are stored as the number of quarters (starting at 0) since the Unix Epoch (1970-01-01).

Value

A `<grates_yearquarter>` object.

See Also

`as_yearquarter()` and `new_yearquarter()`.

Examples

```
yearquarter(year = 2000L, quarter = 3L)
```

yearweek *Constructor for yearweek objects*

Description

`yearweek()` is a constructor for `<grates_yearweek>` objects. These are weeks whose first day can be specified by the user.

Usage

```
yearweek(year = integer(), week = integer(), firstday = 1L)
```

Arguments

`year`	`[integer]` Vector representing the year associated with `week`. `double` vectors will be converted via `as.integer(floor(x))`.
`week`	`[integer]` Vector representing the week associated with 'year. `double` vectors will be converted via `as.integer(floor(x))`.
`firstday`	`[integer]` The day the week starts on from 1 (Monday) to 7 (Sunday).

Details

For yearweek objects the first week of a "year" is considered to be the first yearweek containing 4 days of the given calendar year. This means that the calendar year will sometimes be different to that of the associated yearweek object.

Value

A `<grates_yearweek>` object with subclass corresponding to the first day of the week they represent (e.g. `<grates_yearweek_monday>`).

Note

Internally `<grates_yearweek>` objects are stored as the number of weeks (starting at 0) from the date of the `firstday` nearest the Unix Epoch (1970-01-01). That is, the number of seven day periods from:

```
- 1969-12-29 for `firstday` equal to 1 (Monday)
- 1969-12-30 for `firstday` equal to 2 (Tuesday)
- 1969-12-31 for `firstday` equal to 3 (Wednesday)
- 1970-01-01 for `firstday` equal to 4 (Thursday)
- 1970-01-02 for `firstday` equal to 5 (Friday)
- 1970-01-03 for `firstday` equal to 6 (Saturday)
- 1970-01-04 for `firstday` equal to 7 (Sunday)
```

See Also

`as_yearweek()` and `new_yearweek()`.

Examples

```
yearweek(year = 2000L, week = 3L)
```

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