

# Package ‘grates’

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**Title** Grouped Date Classes

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**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.

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**License** MIT + file LICENSE

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as_epiweek	<i>Coerce to a epiweek object</i>
------------	-----------------------------------

---

### 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: <ul style="list-style-type: none"> <li>• Character input is first parsed using <code>as.Date()</code>.</li> <li>• POSIXt inputs are converted with the timezone respected.</li> </ul>
n	[integer] Number of days that are being grouped.
...	Only used for character input where additional arguments are passed through to <code>as.Date()</code> .
offset	[integer] or [date] Value you wish to start counting periods from relative to the Unix Epoch: <ul style="list-style-type: none"> <li>• For integer values this is stored scaled by n (<code>offset &lt;- as.integer(offset) %% n</code>).</li> <li>• For date values this is first converted to an integer offset (<code>offset &lt;- floor(as.numeric(offset))</code>) and then scaled via n as above.</li> </ul>

## 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	<i>Coerce an object to year-month</i>
--------------	---------------------------------------

---

### 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	<i>Coerce an object to year-quarter</i>
----------------	---

---

**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	<i>Coerce to a yearweek object</i>
-------------	------------------------------------

---

**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

<code>x</code>	grouped date vector.
<code>date</code>	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**

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

**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, ...)  
  
## S3 method for class 'grates_int_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	<i>Constructor for isoweek objects</i>
---------	--

---

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

**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 <code>as.integer(floor(x))</code> .
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**

<code>x</code>	<code>[integer]</code> Vector representing the number of weeks. double vectors will be converted via <code>as.integer(floor(x))</code> .
<code>xx</code>	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**

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

---

### 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 <code>as.integer(floor(x))</code> .
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	<i>Minimal constructor for a yearmonth object</i>
---------------	---

---

### 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 <code>as.integer(floor(x))</code> .
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	<i>Minimal constructor for a yearquarter object</i>
-----------------	---

---

**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 <code>as.integer(floor(x))</code> .
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	<i>Minimal constructor for a yearweek object</i>
--------------	--

---

**Description**

new\_yearweek() is a constructor for <grates\_yearweek> objects aimed at developers.

**Usage**

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

```
is_yearweek(xx)
```

**Arguments**

<code>x</code>	[integer] Vector representing the number of weeks. double vectors will be converted via <code>as.integer(floor(x))</code> .
<code>firstday</code>	[integer] The day the week starts on from 1 (Monday) to 7 (Sunday).
<code>xx</code>	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_int_period
      Print an int_period object
```

---

**Description**

Print an `int_period` object



**Usage**

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

**Arguments**

- x                   A <grates\_int\_period> object.
- ...                 Not currently used.

---

`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 epiweek format (YYYY-Www). If "week" then the labels are of the form Www (e.g. W37). Otherwise 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 isoweek format (YYYY-Www). If "week" then the labels are of the form Www (e.g. W37). Otherwise 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**

<code>...</code>	Not currently used.
<code>breaks</code>	A <code>&lt;grates_yearmonth&gt;</code> vector of the desired breaks.
<code>n.breaks</code>	[integer] Approximate number of breaks calculated using <code>scales::breaks_pretty</code> (default 6L). Will only have an effect if <code>breaks = waiver()</code> .
<code>format</code>	Format to use if "Date" scales are required. If not NULL then the value is used by <code>format.Date()</code> 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).
firstday	Will only have an effect if breaks = waiver(). [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 "week" then the labels are of the form Www (e.g. W37). Otherwise the value is used by format.Date() and can be any input acceptable by that function.

### Value

A scale for use with ggplot2.

---

year	<i>Construct a year object</i>
------	--------------------------------

---

**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 <code>as.integer(floor(x))</code> .
object	R object.

**Value**

A <grates\_year> object.

**Examples**

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

---

yearmonth	<i>Constructor for yearmonth objects</i>
-----------	--

---

**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 <code>as.integer(floor(x))</code> .
month	[integer] Vector representing the month associated with 'year'. double vectors will be converted via <code>as.integer(floor(x))</code> .

**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 <code>as.integer(floor(x))</code> .
quarter	[integer] Vector representing the quarter associated with 'year'. double vectors will be converted via <code>as.integer(floor(x))</code> .

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