

Package ‘eurostat’

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Type Package

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Description Tools to download data from the Eurostat database
<<http://ec.europa.eu/eurostat>> together with search and
manipulation utilities.

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LazyData true

URL <https://ropengov.github.io/eurostat>

BugReports <https://github.com/ropengov/eurostat/issues>

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eurostat-package	<i>R Tools for Eurostat open data</i>
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Description

Brief summary of the eurostat package

Details

Package:	eurostat
Type:	Package
Version:	See sessionInfo() or DESCRIPTION file
Date:	2014-2017
License:	BSD_2_clause + LICENSE
LazyLoad:	yes

R Tools for Eurostat Open Data

Author(s)

Leo Lahti, Janne Huovari, Markus Kainu, Przemyslaw Biecek <ropengov-forum@googlegroups.com>
<https://ropengov.github.io/eurostat>

References

See citation("eurostat") <https://ropengov.github.io/eurostat>

Examples

```
library(eurostat)
```

clean_eurostat_cache *Clean Eurostat Cache*

Description

Delete all .rds files from the eurostat cache directory. See [get_eurostat](#) for more on cache.

Usage

```
clean_eurostat_cache(cache_dir = NULL)
```

Arguments

cache_dir A path to cache directory. If NULL (default) tries to clean default temporary cache directory.

Author(s)

Przemyslaw Biecek, Leo Lahti, Janne Huovari and Markus Kainu <ropengov-forum@googlegroups.com>
<http://github.com/ropengov/eurostat>

Examples

```
clean_eurostat_cache()
```

cut_to_classes *Cuts the Values Column into Classes and Polishes the Labels*

Description

Categorises a numeric vector into automatic or manually defined categories. and polishes the labels ready for used in mapping with `merge_with_geodata` function and `ggplot2`.

Usage

```
cut_to_classes(x, n = 5, style = "jenks", manual = FALSE,  
              manual_breaks = NULL, decimals = 0, nodata_label = "No data")
```

Arguments

x	A numeric vector, eg. values variable in data returned by <code>get_eurostat</code>
n	A numeric. number of classes/categories
style	Chosen style: one of "fixed", "sd", "equal", "pretty", "quantile", "kmeans", "hclust", "bclust", "fisher", or "jenks"
manual	Logical. If manual breaks are being used
manual_breaks	Numeric vector with manual threshold values
decimals	Number of decimals to include with labels
nodata_label	String. Text label for NA category.

Value

a factor.

Author(s)

Markus Kainu <markuskainu@gmail.com>

Examples

```
## Not run:
lp <- get_eurostat("nama_aux_lp")
lp$class <- cut_to_classes(lp$values, n=5, style="jenks", decimals=1)

## End(Not run)
```

dic_order

Order of Variable Levels from Eurostat Dictionary.

Description

Orders the factor levels.

Usage

```
dic_order(x, dic, type)
```

Arguments

x	a variable (code or labelled) to get order for.
dic	a name of the dictionary. Correspond a variable name in the data_frame from get_eurostat . Can be also data_frame from get_eurostat_dic .
type	a type of the x. Could be code or label.

Details

Some variables, like classifications, have logical or conventional ordering. Eurostat data tables are not necessarily ordered in this order. The function `dic_order` gets the ordering from Eurostat classifications dictionaries. The function `label_eurostat` can also order factor levels of labels with argument `eu_order = TRUE`.

Value

A numeric vector of orders.

Author(s)

Przemyslaw Biecek, Leo Lahti, Janne Huovari and Markus Kainu <ropengov-forum@googlegroups.com>
<http://github.com/ropengov/eurostat>

eurotime2date	<i>Date Conversion from Eurostat Time Format</i>
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Description

Date conversion from Eurostat time format. A function to convert Eurostat time values to objects of class `Date` representing calendar dates.

Usage

```
eurotime2date(x, last = FALSE)
```

Arguments

<code>x</code>	a character string with time information in Eurostat time format.
<code>last</code>	a logical. If <code>FALSE</code> (default) the date is the first date of the period (month, quarter or year). If <code>TRUE</code> the date is the last date of the period.

Value

an object of class `Date`.

Author(s)

Janne Huovari <janne.huovari@ptt.fi>

Examples

```
## Not run:
lp <- get_eurostat("namq_aux_lp", time_format = "raw")
lp$time <- eurotime2date(x = lp$time)

un <- get_eurostat("une_rt_m", time_format = "raw")
un$time <- eurotime2date(x = un$time)

lpa <- get_eurostat("nama_aux_lp", time_format = "raw")
lpa$time <- eurotime2date(x = lpa$time)

eur_d <- get_eurostat("ert_bil_eur_d", time_format = "raw")
eur_d$time <- eurotime2date(x = eur_d$time)

## End(Not run)
```

eurotime2num

Conversion of Eurostat Time Format to Numeric

Description

A conversion of a Eurostat time format to numeric.

Usage

```
eurotime2num(x)
```

Arguments

x a character string with time information in Eurostat time format.

Details

Bi-annual, quarterly and monthly data is presented as fraction of the year in beginning of the period.

Value

see [as.numeric](#).

Author(s)

Janne Huovari <janne.huovari@ptt.fi>

Examples

```
## Not run:
lp <- get_eurostat("namq_aux_lp", time_format = "raw")
lp$time <- eurotime2num(x = lp$time)

un <- get_eurostat("une_rt_m", time_format = "raw")
un$time <- eurotime2num(x = un$time)

lpa <- get_eurostat("nama_aux_lp", time_format = "raw")
lpa$time <- eurotime2num(x = lpa$time)

eur_d <- get_eurostat("ert_bil_eur_d", time_format = "raw")
eur_d$time <- eurotime2num(x = eur_d$time)

## End(Not run)
```

eu_countries

Countries and Country Codes

Description

Countries and country codes in EU, Euro area, EFTA and EU candidate countries.

Usage

eu_countries

ea_countries

efta_countries

eu_candidate_countries

Format

A data_frame:

code Country code in the Eurostat database

name Country name in English

Source

http://ec.europa.eu/eurostat/statistics-explained/index.php/Tutorial:Country_codes_and_protocol_order, http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Euro_area

get_eurostat *Read Eurostat Data*

Description

Download data sets from Eurostat ec.europa.eu/eurostat.

Usage

```
get_eurostat(id, time_format = "date", filters = "none", type = "code",
             select_time = NULL, cache = TRUE, update_cache = FALSE,
             cache_dir = NULL, compress_file = TRUE,
             stringsAsFactors = default.stringsAsFactors(), keepFlags = FALSE, ...)
```

Arguments

id	A code name for the dataset of interest. See search_eurostat or details for how to get code.
time_format	a string giving a type of the conversion of the time column from the eurostat format. A "date" (default) converts to a Date with a first date of the period. A "date_last" converts to a Date with a last date of the period. A "num" converts to a numeric and "raw" does not do conversion. See eurotime2date and eurotime2num .
filters	a "none" (default) to get a whole dataset or a named list of filters to get just part of the table. Names of list objects are Eurostat variable codes and values are vectors of observation codes. If NULL the whole dataset is returned via API. More on details. See more on filters and limitations per query via API from for get_eurostat_json .
type	A type of variables, "code" (default) or "label".
select_time	a character symbol for a time frequency or NULL, which is used by default as most datasets have just one time frequency. For datasets with multiple time frequencies, select the desired time format with: Y = annual, S = semi-annual, Q = quarterly, M = monthly. For all frequencies in same data frame time_format = "raw" should be used.
cache	a logical whether to do caching. Default is TRUE. Affects only queries from the bulk download facility.
update_cache	a logical whether to update cache. Can be set also with options(eurostat_update = TRUE)
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates 'eurostat' directory in the temporary directory from tempdir . Directory can also be set with option eurostat_cache_dir.
compress_file	a logical whether to compress the RDS-file in caching. Default is TRUE.
stringsAsFactors	if TRUE (the default) variables are converted to factors in original Eurostat order. If FALSE they are returned as a character.

keepFlags a logical whether the flags (e.g. "confidential", "provisional") should be kept in a separate column or if they can be removed. Default is FALSE.

... further argument for [get_eurostat_json](#).

Details

Data sets are downloaded from [the Eurostat bulk download facility](#) or from The Eurostat Web Services [JSON API](#). If only the table id is given, the whole table is downloaded from the bulk download facility. If also filters are defined the JSON API is used.

The bulk download facility is the fastest method to download whole datasets. It is also often the only way as the JSON API has limitation of maximum 50 sub-indicators at time and whole datasets usually exceeds that. Also, it seems that multi frequency datasets can only be retrived via bulk download facility and the `select_time` is not available for JSON API method.

By default datasets from the bulk download facility are cached as they are often rather large. Caching is not (currently) possible for datasets from JSON API. Cache files are stored in a temporary directory by default or in a named directory if `cache_dir` or option `eurostat_cache_dir` is defined. The cache can be emptied with [clean_eurostat_cache](#).

The id, a code, for the dataset can be searched with the [search_eurostat](#) or from the Eurostat database <http://ec.europa.eu/eurostat/data/database>. The Eurostat database gives codes in the Data Navigation Tree after every dataset in parenthesis.

Value

a tibble. One column for each dimension in the data and the values column for numerical values. The time column for a time dimension. Data from bulk download facility do not include items whose all values are missing.

Author(s)

Przemyslaw Biecek, Leo Lahti, Janne Huovari and Markus Kainu <ropengov-forum@googlegroups.com>
<http://github.com/ropengov/eurostat>

See Also

[search_eurostat](#), [label_eurostat](#)

Examples

```
## Not run:
k <- get_eurostat("nama_10_lp_ulc")
k <- get_eurostat("nama_10_lp_ulc", time_format = "num")
k <- get_eurostat("nama_10_lp_ulc", update_cache = TRUE)
dir.create(file.path(tempdir(), "r_cache"))
k <- get_eurostat("nama_10_lp_ulc",
                 cache_dir = file.path(tempdir(), "r_cache"))
options(eurostat_update = TRUE)
k <- get_eurostat("nama_10_lp_ulc")
options(eurostat_update = FALSE)
options(eurostat_cache_dir = "r_cache")
```

```
k <- get_eurostat("nama_10_lp_ulc")
k <- get_eurostat("nama_10_lp_ulc", cache = FALSE)
k <- get_eurostat("avia_gonc", select_time = "Y", cache = FALSE)

dd <- get_eurostat("namq_aux_lp",
                  filters = list(geo = "FI",
                                indic_na = "RLPH",
                                unit = "EUR_HRS",
                                s_adj = "NSA"))

## End(Not run)
```

get_eurostat_dic *Download Eurostat Dictionary*

Description

Download a Eurostat dictionary.

Usage

```
get_eurostat_dic(dictname, lang = "en")
```

Arguments

dictname	A character, dictionary for the variable to be downloaded.
lang	A character, language code. Options: "en" (default) / "fr" / "de".

Details

For given coded variable from Eurostat ec.europa.eu/eurostat. The dictionaries link codes with human-readable labels. To translate codes to labels, use [label_eurostat](#).

Value

tibble with two columns: code names and full names.

Author(s)

Przemyslaw Biecek and Leo Lahti <leo.lahti@iki.fi>. Thanks to Wietse Dol for contributions.

References

See `citation("eurostat")`.

See Also

[label_eurostat](#), [get_eurostat](#), [search_eurostat](#).

Examples

```
## Not run:
tmp <- get_eurostat_dic("crop_pro")
head(tmp)
tmp <- get_eurostat_dic("crop_pro", lang = "fr")

## End(Not run)
```

get_eurostat_geospatial

Download Geospatial Data from CISGO

Description

Downloads either a SpatialPolygonDataFrame or a data_frame preprocessed using `ggplot2::fortify`.

Usage

```
get_eurostat_geospatial(output_class = "spdf", resolution = "60",
  cache = TRUE, update_cache = FALSE, cache_dir = NULL)
```

Arguments

output_class	A string. Class of object returned, either df (data_frame) or spdf (SpatialPolygonDataFrame)
resolution	Resolution of the geospatial data. One of "60" (1:60million), "20" (1:20million), "10" (1:10million), "01" (1:1million),
cache	a logical whether to do caching. Default is TRUE. Affects only queries from the bulk download facility.
update_cache	a logical whether to update cache. Can be set also with <code>options(eurostat_update = TRUE)</code>
cache_dir	a path to a cache directory. The directory have to exist. The NULL (default) uses and creates 'eurostat' directory in the temporary directory from <code>tempdir</code> . Directory can also be set with option <code>eurostat_cache_dir</code> .

Details

The data source URL is <http://ec.europa.eu/eurostat/web/gisco/geodata/reference-data/administrative-units-statistical-units>.

Value

a data_frame or SpatialPolygonDataFrame.

Author(s)

Markus Kainu <markuskainu@gmail.com>

Examples

```
## Not run:
lp <- get_eurostat_geospatial(output_class = "spdf", resolution = "60")
splot(lp, "STAT_LEVEL_")
# or
lp <- get_eurostat_geospatial(output_class = "df", resolution = "60")
ggplot(lp, aes(x=long,y=lat,group=group,fill=STAT_LEVEL_,color="white")) + geom_polygon()

## End(Not run)
```

get_eurostat_json

Get Data from Eurostat API in JSON

Description

Retrieve data from Eurostat API in JSON format.

Usage

```
get_eurostat_json(id, filters = NULL, type = c("code", "label", "both"),
  lang = c("en", "fr", "de"), stringsAsFactors = default.stringsAsFactors())
```

Arguments

id	A code name for the dataset of interested. See the table of contents of eurostat datasets for more details.
filters	A named list of filters. Names of list objects are Eurostat variable codes and values are vectors of observation codes. If NULL (default) the whole dataset is returned. See details for more on filters and limitations per query.
type	A type of variables, "code" (default), "label" or "both". The "both" will return a data_frame with named vectors, labels as values and codes as names.
lang	A language used for metadata (en/fr/de).
stringsAsFactors	if TRUE (the default) variables are converted to factors in original Eurostat order. If FALSE they are returned as a character.

Details

Data to retrieve from [The Eurostat Web Services](#) can be specified with filters. Normally, it is better to use JSON query through [get_eurostat](#), than to use [get_eurostat_json](#) directly.

Queries are limited to 50 sub-indicators at a time. A time can be filtered with fixed "time" filter or with "sinceTimePeriod" and "lastTimePeriod" filters. A sinceTimePeriod = 2000 returns observations from 2000 to a last available. A lastTimePeriod = 10 returns a 10 last observations.

Value

A dataset as a data_frame.

Author(s)

Przemyslaw Biecek, Leo Lahti, Janne Huovari and Markus Kainu <ropengov-forum@googlegroups.com>
<http://github.com/ropengov/eurostat>

Examples

```
## Not run:  
tmp <- get_eurostat_json("cdh_e_fos")  
yy <- get_eurostat_json(id = "nama_gdp_c", filters = list(geo=c("EU28", "FI"),  
                                                         unit="EUR_HAB",  
                                                         indic_na="B1GM"))  
  
## End(Not run)
```

get_eurostat_raw *Download Data from Eurostat Database*

Description

Download data from the eurostat database.

Usage

```
get_eurostat_raw(id)
```

Arguments

id A code name for the dataset of interested. See the table of contents of eurostat datasets for more details.

Details

Data is downloaded from <http://ec.europa.eu/eurostat/estat-navtree-portlet-prod/BulkDownloadListing> and transformed into tabular format.

Value

A dataset in tibble format. First column contains comma separated codes of cases. Other columns usually corresponds to years and column names are years with preceding X. Data is in character format as it contains values together with eurostat flags for data.

Author(s)

Przemyslaw Biecek, Leo Lahti and Janne Huovari <ropengov-forum@googlegroups.com>

References

see citation("eurostat")

See Also

[get_eurostat](#).

Examples

```
## Not run:
  tmp <- eurostat:::get_eurostat_raw("educ_iste")
  head(tmp)

## End(Not run)
```

get_eurostat_toc *Download Table of Contents of Eurostat Data Sets*

Description

Download table of contents (TOC) of eurostat datasets.

Usage

```
get_eurostat_toc()
```

Details

The TOC is downloaded from http://ec.europa.eu/eurostat/estat-navtree-portlet-prod/BulkDownloadListing?sort=1&file=table_of_contents_en.txt. The values in column 'code' should be used to download a selected dataset.

Value

A tibble with eight columns

- titleThe name of dataset of theme
- codeThe codename of dataset of theme, will be used by the eurostat and get_eurostat_raw functions.
- typeIs it a dataset, folder or table.
- last.update.of.data, last.table.structure.change, data.start, data.endDates.

Author(s)

Przemyslaw Biecek and Leo Lahti <ropengov-forum@googlegroups.com>

References

See citation("eurostat").

See Also

[get_eurostat](#), [search_eurostat](#).

Examples

```
## Not run: tmp <- get_eurostat_toc(); head(tmp)
```

harmonize_country_code
Harmonize Country Code

Description

The European Commission and the Eurostat generally uses ISO 3166-1 alpha-2 codes with two exceptions: EL (not GR) is used to represent Greece, and UK (not GB) is used to represent the United Kingdom. This function turns country codes into to ISO 3166-1 alpha-2.

Usage

```
harmonize_country_code(x)
```

Arguments

x A character or a factor vector of eurostat countycodes.

Value

a vector.

Author(s)

Janne Huovari <janne.huovari@ptt.fi>

Examples

```
## Not run:  
lp <- get_eurostat("nama_aux_lp")  
lp$geo <- harmonize_country_code(lp$geo)  
  
## End(Not run)
```

label_eurostat	<i>Get Eurostat Codes</i>
----------------	---------------------------

Description

Get definitions for Eurostat codes from Eurostat dictionaries.

Usage

```
label_eurostat(x, dic = NULL, code = NULL, eu_order = FALSE,  
              lang = "en")
```

```
label_eurostat_vars(x, lang = "en")
```

```
label_eurostat_tables(x, lang = "en")
```

Arguments

x	A character or a factor vector or a data_frame.
dic	A string (vector) naming eurostat dictionary or dictionaries. If NULL (default) dictionary names taken from column names of the data_frame.
code	For data_frames names of the column for which also code columns should be retained. The suffix "_code" is added to code column names.
eu_order	Logical. Should Eurostat ordering used for label levels. Affects only factors.
lang	A character, code for language. Available are "en" (default), "fr" and "de".

Details

A character or a factor vector of codes returns a corresponding vector of definitions. label_eurostat labels also data_frames from [get_eurostat](#). For vectors a dictionary name have to be supplied. For data_frames dictionary names are taken from column names. "time" and "values" columns are returned as they were, so you can supply data_frame from [get_eurostat](#) and get data_frame with definitions instead of codes.

Value

a vector or a data_frame.

Functions

- label_eurostat_vars: Get definitions for variable (column) names. For objects other than characters or factors definitions are get for names.
- label_eurostat_tables: Get definitions for table names

Author(s)

Janne Huovari <janne.huovari@ptt.fi>

Examples

```
## Not run:
lp <- get_eurostat("nama_aux_lp")
lp1 <- label_eurostat(lp)
str(lp1)
lp1_order <- label_eurostat(lp, eu_order = TRUE)
lp1_code <- label_eurostat(lp, code = "unit")
label_eurostat_vars(names(lp))
label_eurostat_tables("nama_aux_lp")

## End(Not run)
```

```
merge_eurostat_geodata
```

Merge Preprocessed Geospatial Data from CISGO with data_frame from Eurostat

Description

Merges data_frame obtained from Eurostat with get_eurostat with geospatial data preprocessed either using ggplot2::fortify into a data_frame or a regular SpatialPolygonDataFrame. The resulting data_frame can be plotted using ggplot2 and SpatialPolygonDataFrame using sp::spplot.

Usage

```
merge_eurostat_geodata(data, geocolumn = "geo", resolution = "60",
  output_class = "df", all_regions = FALSE, cache = TRUE,
  update_cache = FALSE, cache_dir = NULL)
```

Arguments

data	A data_frame including a character vector that consists of values following current NUTS classification
geocolumn	A string. Name of the column with NUTS information (geo in data_frames fetched using get_eurostat)
resolution	Resolution of the geospatial data. One of "60" (1:60million), "20" (1:20million), "10" (1:10million), "01" (1:1million),
output_class	A string. Class of object returned, either df (data_frame) or spdf (SpatialPolygonDataFrame)
all_regions	Logical. To include all the regions from spatial data or only the ones included in the fetched Eurostat attribute data
cache	cache. Logical.
update_cache	Update cache. Logical.
cache_dir	Cache directory.

Value

a data_frame or SpatialPolygonDataFrame.

Author(s)

Markus Kainu <markuskainu@gmail.com>

Examples

```
## Not run:
lp <- get_eurostat("nama_aux_lp")
lp1 <- merge_eurostat_geodata(lp, geocolumn="geo", resolution=60,
                             output_class="df", all_regions=FALSE)
str(lp1)

## End(Not run)
```

search_eurostat

Grep Datasets Titles from Eurostat

Description

Lists names of dataset from eurostat with the particular pattern in the description.

Usage

```
search_eurostat(pattern, type = "dataset", fixed = TRUE)
```

```
grepEurostatTOC(pattern, type = "dataset")
```

Arguments

pattern	Character, datasets, folder or tables with this pattern in the description will be returned (depending on the 'type' argument)
type	Grep the Eurostat table of contents either for 'dataset' (default), 'folder', 'table' or "all" (for all types).
fixed	logical. If TRUE, pattern is a string to be matched as is. Change to FALSE if more complex regex matching is needed.

Details

Downloads list of all datasets available on eurostat and return list of names of datasets that contains particular pattern in the dataset description. E.g. all datasets related to education of teaching.

Value

A tibble with eight columns

- title The name of dataset of theme
- code The codename of dataset of theme, will be used by the `get_eurostat` and `get_eurostat_raw` functions.
- type Is it a dataset, folder or table.
- last.update.of.data, last.table.structure.change, data.start, data.end Dates.

Functions

- `grepEurostatTOC`: Old deprecated version

Author(s)

Przemyslaw Biecek and Leo Lahti <ropengov-forum@googlegroups.com>

References

See `citation("eurostat")`

See Also

[get_eurostat](#), [get_eurostat_toc](#)

Examples

```
## Not run:
tmp <- search_eurostat("education")
head(tmp)
# Use "fixed = TRUE" when pattern has characters that would need escaping.
# Here, parentheses would normally need to be escaped in regex
tmp <- search_eurostat("Live births (total) by NUTS 3 region", fixed = TRUE)

## End(Not run)
```

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