Package 'eFRED'

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Title Fetch Data from the Federal Reserve Economic Database

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Author Chris Mann <cmann3@unl.edu>

Maintainer Chris Mann <cmann3@unl.edu>

Description Interact with the FRED API, <https://fred.stlouisfed.org/docs/api/fred/>, to fetch observations across economic series; find information about different economic sources, releases, series, etc.; conduct searches by series name, attributes, or tags; and determine the latest updates. Includes functions for creating panels of related variables with minimal effort and datasets containing data sources, releases, and popular FRED tags.

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Encoding UTF-8

Depends jsonlite, httr, R (>= 2.10)

Suggests knitr, rmarkdown, datasets

VignetteBuilder knitr

LazyData true

RoxygenNote 7.0.2

NeedsCompilation no

Repository CRAN

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R topics documented:

`countries` *Country Codes*

Description

A vector containing ISO country codes used in the Penn World Table.

Usage

```
countries
```

Format

Character vector of length 182

Source

Feenstra, Robert C., Robert Inklaar and Marcel P. Timmer (2015), "The Next Generation of the Penn World Table", American Economic Review, 105(10), 3150-3182, available for download at https://www.rug.nl/ggdc/productivity/pwt/

`country2` *Country Codes*

Description

A vector containing ISO 2-digit country codes.

Usage

```
country2
```

Format

Character vector of length 249

Source

https://en.wikipedia.org/wiki/ISO_3166

---

country3 *Country Codes*

Description

A vector containing ISO 3-digit country codes.

Usage

```
country3
```

Format

Character vector of length 249

Source

https://en.wikipedia.org/wiki/ISO_3166

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fred *Fetch Data Series from FRED*

Description

Function that fetches economic data from the FRED based on the series ids.

Usage

```
fred(
  ...,
  key = NULL,
  all = TRUE,
  info = TRUE,
  realtime_start = NULL,
  realtime_end = NULL,
  long = FALSE
)
```

Arguments

...	character vectors of series ids to search. Any names will be used to label the series in the resulting data.frame
key	32 character lower-cased alpha-numeric character string
all	logical; should all observations be used? Defaults to TRUE. If FALSE, only observations existing in all series will be kept.
info	logical; should information about each series, such as units and title, be kept? If so, the information will be stored in a data.frame under the attribute "info".
realtime_start, realtime_end	character date strings of format "YYY-MM-DD" used obtain information that was known during the specified time period. If empty, the latest update of the information is used.
long	logical; should the resulting data.frame be long or wide? Defaults to FALSE so that a new column is created for each series

Details

The fred function search for series ids from the FRED and returns the values in a data.frame. Unless long=TRUE, a new column will be created for each series. The dates for each observation will be included in the "date" column and will be of class "Date". Each series will be a numeric value.

If a series cannot be found, then it will be skipped and R will issue a warning.

To access ALFRED, or the archived Federal Reserve Economic Data, use the realtime_start and realtime_end arguments to specify a time frame. More details about real time periods can be found at https://fred.stlouisfed.org/docs/api/fred/realtime_period.html.

Value

data.frame

Examples

```
## Not run:
api_key <- "abcdefghijklmnopqrstuvwxyz123456"

# Naive Phillips Curve Estimation
df <- fred(p = "CPIAUCSL", u = "u6rate", key=api_key)
head(df)

df$pi  <- log(df$p) - log(c(NA, df$p[2:nrow(df)]))
reg_pc <- lm(pi ~ u, data = df)
summary(reg_pc)

# Different variations of the CPI
cpis <- c("CPIMEDSL", "CPIFABSL", "CPIHOSSL")
names(cpis) <- c("P_Med", "P_Food", "P_House")

df_cpi <- fred(cpis, key=api_key, long=TRUE)
```

```
head(df)

## End(Not run)
```

`fred_category` *Fetch Information on a Category in FRED*

Description

Each of the functions accept a category ID and return the requested information in a data.frame.

Usage

```
fred_category(..., key = NULL)

fred_category_children(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)

fred_category_related(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)

fred_category_series(..., key = NULL, args = list())

fred_category_tags(..., key = NULL, args = list())

fred_category_related_tags(..., key = NULL, args = list())
```

Arguments

`...`	character or numeric vectors of a category ID to fetch. Names are ignored.
`key`	32 character lower-cased alpha-numeric character string
`realtime_start, realtime_end`	character date strings of format "YYY-MM-DD" used obtain information that was known during the specified time period. If empty, the latest update of the information is used.
`args`	named list of other arguments passed to the API, including "limit", "offset", "sort_order", etc. See `fred_search` for more details on accepted parameters.

Details

Each function returns the following information in a data.frame.

`fred_category` Category id, its name, and the id of its parent

`fred_category_children` Same as `fred_category`

`fred_category_related` Same as `fred_category`

`fred_category_series` Series id, its title, observations start and end, frequency, units, seasonal adjustment type, popularity, realtime start and end, and when it was last updated

`fred_category_tags` Tag name and its group id, popularity of tag, number of series in each tag, when it was created, and other notes

`fred_category_related_tags` Same as `fred_category_tags`

Value

data.frame with entries described in details

Functions

- `fred_category`: get the name and parent_id for a FRED category
- `fred_category_children`: get the category children ids of a given parent_id
- `fred_category_related`: get the categories that are related to a category id
- `fred_category_series`: get all series within a particular category
- `fred_category_tags`: get all tags associated with a particular category
- `fred_category_related_tags`: get all tags related to tags within a particular category

Examples

```
## Not run:
api_key <- "abcdefghijklmnopqrstuvwxyz123456"

# What category is the unemployment rate in?
un_cat <- fred_category("UNRATE", key=api_key)

# What other series are in the same category?
other_in_cat <- fred_category_series(un_cat$id, key=api_key)
head(other_in_cat)

## End(Not run)
```

fred_group *Fetch and Create a Panel of Data*

Description

Function that fetches data series with related codes and places the results into a long data.frame.

Usage

```
fred_group(
  id,
  groups,
  type = c("prefix", "postfix", "infix"),
  key = NULL,
  name = NULL,
  grp_name = "group",
  realtime_start = NULL,
  realtime_end = NULL
)

fred_state(
  id,
  type = c("prefix", "postfix", "infix"),
  key = NULL,
  name = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)
```

Arguments

id	character string containing the common series id segment
groups	character vector denoting the variation in the series
type	how should the group vectors be combined with the id? "prefix" places the groups before the id, "postfix" after the id, and use "infix" to place the group code between values in id *(requires id to be a length 2 character vector)*
key	32 character lower-cased alpha-numeric character string
name	character string describing the name of the value column. If NULL, the id will be used.
grp_name	character string describing the name of the group column. Defaults to "group".
realtime_start, realtime_end	character date strings of format "YYY-MM-DD" used obtain information that was known during the specified time period. If empty, the latest update of the information is used.

Details

The fred_group command is convenience function that searches for many different series at once and places them in a panel. This is similar to the fred command except that it can be more convenient when the series are related to each other. For example, the statewide unemployment rates from the Bureau of Labor Statistics have all codes with the format: "<State Abbreviation><UR>". If state abbreviations are located in variable state.abb, then the command fred_group("UR", state.abb, "prefix", key) would search place all unemployment rates into a data.frame.

fred_state is a wrapper around fred_group with the state abbreviations used for groups and with the group column "state".

Value

data.frame

Functions

- fred_state: Fetch data across each state

Examples

```
## Not run:
api_key <- "abcdefghijklmnopqrstuvwxyz123456"

# Panel of Unemployment Rates Across States
unemploy <- fred_state("UR", key = api_key)
unemploy

# Panel of Constant GDP per Capita by Country
GDP <- fred_group("NYGDPPCAPKD", eFRED::countries, type="postfix",
  key=api_key, name= "gdppc", grp_name="country")
GDP

## End(Not run)
```

---

fred_releases *Fetch Information on a Release in FRED*

Description

Each of the functions accept a release name/number and return the requested information in a data.frame.

Usage

```
fred_releases(key = NULL, args = list())

fred_releases_dates(key = NULL, args = list())

fred_release(..., key = NULL, args = list())

fred_release_dates(..., key = NULL, args = list())

fred_release_series(..., key = NULL, args = list())

fred_release_sources(..., key = NULL, args = list())

fred_release_tags(..., key = NULL, args = list())

fred_release_related_tags(..., key = NULL, args = list())

fred_release_tables(..., key = NULL, args = list())
```

Arguments

key	32 character lower-cased alpha-numeric character string
args	named list of other arguments passed to the API, including "limit", "offset", "sort_order", etc. See fred_search for more details on accepted parameters.
...	character or numeric vectors of release ids to search

Details

Each function returns the following information in a data.frame.

`fred_releases` Release id, its name, a url link, whether there is a press release, and realtime start and end dates

`fred_releases_dates` Release id, its name, and date of release

`fred_release` Release id, its name, a url link, whether there is a press release, and realtime start and end dates

`fred_release_dates` Release id and its release date

`fred_release_series` Series id, its title, observations start and end, frequency, units, seasonal adjustment type, popularity, realtime start and end, and when it was last updated

`fred_release_sources` Source id, name of source, url link, and realtime start and end dates

`fred_release_tags` Tag name and its group id, popularity of tag, number of series in each tag, when it was created, and other notes

`fred_release_related_tags` Same as `fred_release_tags`

`fred_release_tables` Release, element, parent, and series ids, type, and name

Value

data.frame with entries described in details

Functions

- `fred_releases`: get all releases of economic data
- `fred_releases_dates`: get the dates of all economic releases
- `fred_release`: get information about a particular release
- `fred_release_dates`: get release dates for a particular release
- `fred_release_series`: get all series associated with a particular release
- `fred_release_sources`: get the sources associated with a particular release
- `fred_release_tags`: get all tags associated with a particular release
- `fred_release_related_tags`: get all related tags associated with a particular release
- `fred_release_tables`: get the release tables for a particular release

`fred_search` *Search for Series on FRED*

Description

Each function receives a character string and returns a data.frame containing information on different series, tags, or related tags of the search.

Usage

```
fred_search(text, key = NULL, args = list())

fred_search_tags(text, key = NULL, args = list())

fred_search_related_tags(text, key = NULL, args = list())
```

Arguments

`text`	character string used for search. All spaces will automatically be converted appropriately.
`key`	32 character lower-cased alpha-numeric character string
`args`	named list of other arguments passed to the API, including "limit", "offset", "sort_order", etc. See details below.

Details

Search arguments accept any of the following:

`search_type` either `"full_text"` or `"series_id"` determining whether the description, title, units, and other information are searched or only the id. Defaults to full text.

`realtime_start`, `realtime_end` character string of format `"YYYY-MM-DD"` determining the real-time period. This is used to find historical series.

`limit` integer between 1 and 1000 determining the maximum number of results to return.

`offset` Non-negative integer

`order_by` One of the following: `"search_rank"`, `"series_id"`, `"title"`, `"units"`, `"frequency"`, `"seasonal_adjustment"`, `"realtime_start"`, `"realtime_end"`, `"last_updated"`, `"observation_start"`, `"observation_end"`, `"popularity"`, or `"group_popularity"`. Default is `"search_rank"`.

`sort_order` Either `"asc"` for ascending or `"desc"` for descending order.

`filter_variable` String to filter the results by.

`tag_names` String of tag names separated by semicolons for filtering results.

`exclude_tag_names` String of tag names separated by semicolons that should not be included.

These should be included in a list such as `args = list(limit = 10, sort_order = "asc")`. The results are included in a data.frame with all information about the series, including detailed notes. The results are best viewed in the RStudio Viewer or with the title extracted.

Each function returns the following information in a data.frame.

`fred_search` Series id, its title, observations start and end, frequency, units, seasonal adjustment type, popularity, realtime start and end, and when it was last updated

`fred_search_tags` Tag name and its group id, popularity of tag, number of series in each tag, when it was created, and other notes

`fred_search_related_tags` Same as `fred_search_tags`

Value

data.frame with entries described in details

Functions

- `fred_search`: obtain series related to search
- `fred_search_tags`: obtain tags related to search
- `fred_search_related_tags`: obtain related tags related to search

Examples

```
## Not run:
api_key <- "abcdefghijklmnopqrstuvwxyz123456"

# Searching GDP in China, descending order by "title"
results <- fred_search("GDP China", key=api_key,
  args = list(sort_order="desc", order_by="title"))

# Fetch top 2 series
df <- fred(results$id[1:2])
head(df)

## End(Not run)
```

fred_series *Fetch Data or Information on a SERIES in FRED*

Description

Each of the functions accept a series ID from FRED and return a data.frame with information about the series.

Usage

```
fred_series(..., key = NULL, realtime_start = NULL, realtime_end = NULL)

fred_series_release(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)

fred_series_categories(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)

fred_series_tags(..., key = NULL, realtime_start = NULL, realtime_end = NULL)

fred_observations(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL,
  all = TRUE
)

fred_series_vintage(
  ...,
  key = NULL,
  realtime_start = NULL,
  realtime_end = NULL
)
```

Arguments

...	character vectors of series to fetch. If named, then the names are used to identify the series in the result.

`key` 32 character lower-cased alpha-numeric character string

`realtime_start, realtime_end`
character date strings of format "YYY-MM-DD" used obtain information that was known during the specified time period. If empty, the latest update of the information is used.

`all` logical; should all observations be used? Defaults to `TRUE`. If `FALSE`, only observations existing in all series will be kept.

Details

Each function returns the following information in a data.frame.

`fred_observations` Date of observation, its value, and the realtime start and end dates

`fred_series` Series id, its title, observations start and end, frequency, units, seasonal adjustment type, popularity, realtime start and end, and when it was last updated

`fred_series_categories` Category id, its name, and the id of its parent

`fred_series_release` Release id, its name, a url link, whether there is a press release, and realtime start and end dates

`fred_series_tags` Tag name, its group id, popularity, the number of series that are tagged, when it was created, and any notes about the tag

`fred_series_related_tags` Same as `fred_series_tags`

`fred_series_vintage` dates of each vintage

`fred_category_related_tags` Same as `fred_category_tags`

Value

data.frame or list

Functions

- `fred_series`: get information about the series including observation periods, seasonal adjustment, units, title, etc.
- `fred_series_release`: get the release information about the series
- `fred_series_categories`: get the categories into which a series falls
- `fred_series_tags`: get the FRED tags for the series
- `fred_observations`: get the observational data for a series
- `fred_series_vintage`: get the dates in which the data for the series were revised or released. Returns a named list of dates.

fred_sources *Fetch Information on a Data Source in FRED*

Description

Each of the functions accept a source number and return the requested information in a data.frame.

Usage

```
fred_sources(key = NULL, args = list())

fred_source(..., key = NULL, args = list())

fred_source_releases(..., key = NULL, args = list())
```

Arguments

key	32 character lower-cased alpha-numeric character string
args	named list of other arguments passed to the API, mostly for fred_source_releases, including "limit", "offset", "sort_order", etc. See fred_search for more details on accepted parameters.
...	character or numeric vectors of release ids to search

Details

Each function returns the following information in a data.frame.

fred_sources Source id, its name, a url link, and realtime start and end dates

fred_source Same as fred_sources

fred_source_releases Release id, its name, a url link, whether there is a press release, and realtime start and end dates

Value

data.frame with entries described in details

Functions

- fred_sources: get all sources of economic data
- fred_source: get information about a particular source
- fred_source_releases: get releases by a particular source

`fred_tags` *Fetch Information on a Tag in FRED*

Description

Each of the functions accept a tag name and return the requested information in a data.frame.

Usage

```
fred_tags(key = NULL, args = list())

fred_related_tags(..., key = NULL, args = list())

fred_tags_series(..., key = NULL, args = list())
```

Arguments

`key`	32 character lower-cased alpha-numeric character string
`args`	named list of other arguments passed to the API, including "limit", "offset", "sort_order", etc. See `fred_search` for more details on accepted parameters.
`...`	character vectors of tag names to search

Details

Each function returns the following information in a data.frame.

`fred_tags` Tag name, its group id, popularity, the number of series that are tagged, when it was created, and any notes about the tag

`fred_related_tags` Same as `fred_tags`

`fred_tags_series` Series id, its title, observations start and end, frequency, units, seasonal adjustment type, popularity, realtime start and end, and when it was last updated

Value

data.frame with entries described in details

Functions

- `fred_tags`: get the tag names associated with the search parameters
- `fred_related_tags`: get the tags that are related to one or more tag names
- `fred_tags_series`: get the series associated with tags

`fred_updates` *Fetch Series with Recent Updates*

Description

Function that returns a data.frame containing information on series in FRED that were recently updated.

Usage

```
fred_updates(key = NULL, args = list())
```

Arguments

`key`	32 character lower-cased alpha-numeric character string
`args`	named list of other arguments passed to the API. See details.

Details

Arguments accept any of the following:

`realtime_start`, `realtime_end` character string of format `"YYYY-MM-DD"` determining the real-time period. This is used to find historical series.

`limit` integer between 1 and 1000 determining the maximum number of results to return.

`offset` Non-negative integer

`filter_value` Either `"macro"`, `"regional"`, or `"all"` *(the default)* describing the geographic type of the series

`start_time`, `end_time` character string of format `"YYYYMMDDHhmm"` determining the time range, down to minutes, with which to filter the results

Value

data.frame with values for the series id, its title, start and end date of its observations, its frequency, units, whether it is seasonally adjusted, its popularity, when it was last updated, and the realtime start and end dates

parse_search *Convert Search Terms to a API Friendly Format*

Description

The function replaces spaces from character vectors with "+" and separates search terms with ";". Use whenever search terms are needed in the args list for API calls. It is automatically applied for fred_search and not needed.

Usage

```
parse_search(...)
```

Arguments

...	character vectors of search terms

Value

character string

Examples

```
terms <- c("Real GDP", "medical inflation", "Japan")
parse_search(terms, "unemployment")
```

releases *Economic Releases*

Description

A data.frame containing information on the economic releases in FRED. Information is from January 2021. Use fred_releases for an up-to-date version.

Usage

```
releases
```

Format

data.frame with 292 observations and 7 variables:

id release id

realtime_start, realtime_end date releases were saved

name name of the release

press_release logical value for whether there is an associated press release

link a url for more data

notes character string containing information about the release

Source

https://fred.stlouisfed.org/docs/api/fred/releases.html

---

set_fred_key *Set a FRED API Key*

Description

Function used to set the default key. If included, then key arguments in FRED API calls are no longer needed. API keys can be requested at https://fred.stlouisfed.org/docs/api/api_key.html.

Usage

```
set_fred_key(key)
```

Arguments

key	32 character lower-cased alpha-numeric character string

Value

NULL

Examples

```
set_fred_key("abcdefghijklmnopqrstuvwxyz123456")
```

---

sources *Sources of Economic Data*

Description

A data.frame containing information on the sources of data in FRED. Information is from January 2021. Use fred_sources for an up-to-date version.

Usage

```
sources
```

Format

data.frame with 102 observations and 6 variables:

id source id

realtime_start, realtime_end date releases were saved

name name of the source

link a url that links to the source's website

notes character string containing information about the source

Source

https://fred.stlouisfed.org/docs/api/fred/sources.html

---

states *U.S. State Abbreviations*

Description

A vector containing U.S. state abbreviations, including the District of Columbia.

Usage

```
states
```

Format

Character vector of length 51

Source

https://en.wikipedia.org/wiki/List_of_U.S._state_and_territory_abbreviations

---

states_extended *Extended State Abbreviations*

Description

A vector containing abbreviations of U.S. states and territories.

Usage

```
states_extended
```

Format

Character vector of length 51

Source

https://en.wikipedia.org/wiki/List_of_U.S._state_and_territory_abbreviations

---

tags *Popular Tags*

Description

A data.frame containing information on 1000 of the most common tags in FRED. Information is from January 2021. Use fred_tags for an up-to-date version and the ability to refine it further.

Usage

```
tags
```

Format

data.frame with 1000 observations and 6 variables:

name tag name

group_id name of the group associated with the tag

created when the tag was created

popularity integer of the tag's popularity (up to 100)

notes character string containing information about the source

series_count number of series associated with the tag

Source

https://fred.stlouisfed.org/docs/api/fred/tags.html

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