Package ‘eFRED’

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Title Fetch Data from the Federal Reserve Economic Database

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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)

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Description

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

Usage

countries

Format

Character vector of length 182

Source


country2

Description

A vector containing ISO 2-digit country codes.

Usage

country2
Format

Character vector of length 249

Source


---

country3  Country Codes

---

Description

A vector containing ISO 3-digit country codes.

Usage

country3

Format

Character vector of length 249

Source


---

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)
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 "YYYY-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

```r
## 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**

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

```r
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 "YMD-MD" 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 a 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

```r
## 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.
fred_releases

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.
...

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)
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
realtime_start, realtime_end
all

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**

```r
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**

```r
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**

```r
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**

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

**Arguments**

... character vectors of search terms

**Value**

character string

**Examples**

```r
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**

```r
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
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
states

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

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


<table>
<thead>
<tr>
<th>tags</th>
<th>Popular Tags</th>
</tr>
</thead>
</table>

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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