

Package ‘ctrialsgov’

October 18, 2021

Type Package

Title Query Data from U.S. National Library of Medicine's Clinical Trials Database

Version 0.2.5

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Description Tools to create and query database from the U.S. National Library of Medicine's Clinical Trials database <<https://clinicaltrials.gov/>>. Functions provide access a variety of techniques for searching the data using range queries, categorical filtering, and by searching for full-text keywords. Minimal graphical tools are also provided for interactively exploring the constructed data.

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Encoding UTF-8

Depends R (>= 3.5.0)

Imports dplyr, utils, ggplot2, lubridate, plotly, purrr, rlang, stringi, tibble, DBI, methods, Matrix, htmlwidgets

Suggests covr, knitr, rmarkdown, testthat (>= 3.0.0), usethis

VignetteBuilder knitr

LazyData true

LazyDataCompression bzip2

Config/testthat/edition 3

RoxygenNote 7.1.2

NeedsCompilation no

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Repository CRAN

Date/Publication 2021-10-18 16:00:02 UTC

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cancer_studies	<i>Sample of Industry Cancer Trials from 2021</i>
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Description

Cancer clinical trials based on a query where: ‘study_type’ is "Interventional"; ‘sponsor_type’ is "Industry"; ‘date_range’ is trials from 2021-01-01 or newer; The ‘description’ includes the keyword "cancer"; ‘phase’ is reported (not NA); ‘primary_purpose’ is "Treatment"; ‘minimum_enrollment’ is 100.

ctgov_create_data	<i>Initialize the connection</i>
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Description

This function must be run prior to other functions in the package. It creates a parsed and cached version of the clinical trials dataset in memory in R. This makes other function calls relatively efficient. other

Usage

```
ctgov_create_data(con, verbose = TRUE)
```

Arguments

con	an DBI connection object to the database
verbose	logical flag; should progress messages be printed?; defaults to TRUE

Value

does not return any value; used only for side effects

Author(s)

Taylor B. Arnold, <taylor.arnold@acm.org>

ctgov_gantt_labeller *Create a Gantt Labeler for Timeline Tooltips*

Description

Create a Gantt Labeler for Timeline Tooltips

Usage

```
ctgov_gantt_labeller(x)
```

Arguments

x the data.frame object returned from a query.

Value

a string that can be used as a label in ggplotly

ctgov_kwic *Keywords in Context*

Description

Takes a keyword and vector of text and returns instances where the keyword is found within the text.

Usage

```
ctgov_kwic(  
  term,  
  text,  
  names = NULL,  
  n = Inf,  
  ignore_case = TRUE,  
  use_color = FALSE,  
  width = 20L,  
  output = c("cat", "character", "data.frame")  
)
```

Arguments

term	search term as a string
text	vector of text to search
names	optional vector of names corresponding to the text
n	number of results to return; default is Inf
ignore_case	should search ignore case? default is TRUE
use_color	printed results include ASCII color escape sequences; these are set to FALSE because they only work correctly when returned in the terminal
width	how many characters to show as context
output	what kind of output to provide; default prints the results using cat

Value

either nothing, character vector, or data frame depending on the the requested return type

ctgov_load_cache	<i>Download and/or load cached data</i>
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Description

This function downloads a saved version of the full clinical trials dataset from the package's development repository on GitHub (~150MB) and loads it into R for querying. The data will be cached so that it can be re-loaded without downloading. We try to update the cache frequently so this is a convenient way of grabbing the data if you do not need the most up-to-date version of the database.

Usage

```
ctgov_load_cache(force_download = FALSE)
```

Arguments

force_download	logical flag; should the cache be re-downloaded if it already exists? defaults to FALSE
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Value

does not return any value; used only for side effects

Author(s)

Taylor B. Arnold, <taylor.arnold@acm.org>

ctgov_load_sample *Load sample dataset*

Description

This function loads a sample dataset for testing and prototyping purposes. after running, all of the functions in the package can then be used with this sample data. It consists of a 2.5 from ClinicalTrials.gov at the time of the package creation.

Usage

```
ctgov_load_sample()
```

Value

does not return any value; used only for side effects

Author(s)

Taylor B. Arnold, <taylor.arnold@acm.org>

ctgov_plot_timeline *Plot a Timeline for a Set of Clinical Trials*

Description

Plot a Timeline for a Set of Clinical Trials

Usage

```
ctgov_plot_timeline(  
  x,  
  start_date = "start_date",  
  completion_date = "primary_completion_date",  
  label_column = "nct_id",  
  color = label_column,  
  tooltip = ctgov_gantt_labeller(x)  
)
```

Arguments

x	the data.frame object returned from a query.
start_date	the start date column name. (Default is "start_date")
completion_date	the date the trial is set to be complete. (Default "primary_completion_date"). (Default is "primary_completion_date")
label_column	the column denoting the labels for the y-axis. (Default is "nct_id")
color	the column to be used for coloring. (Default is label_column)
tooltip	the tooltips for each of trials. (Default is 'ctgov_gantt_labeller(x)').

See Also

ctgov_gantt_labeller

ctgov_query

Query the ClinicalTrials.gov dataset

Description

This function selects a subset of the clinical trials data by using a variety of different search parameters. These include free text search keywords, range queries for the continuous variables, and exact matches for categorical fields. The function `ctgov_query_terms` shows the categorical levels for the latter. The function will either take the entire dataset loaded into the package environment or a previously queried input.

Usage

```
ctgov_query(
  data = NULL,
  description_kw = NULL,
  sponsor_kw = NULL,
  brief_title_kw = NULL,
  official_title_kw = NULL,
  criteria_kw = NULL,
  intervention_kw = NULL,
  intervention_desc_kw = NULL,
  outcome_kw = NULL,
  outcome_desc_kw = NULL,
  conditions_kw = NULL,
  population_kw = NULL,
  date_range = NULL,
  enrollment_range = NULL,
  minimum_age_range = NULL,
  maximum_age_range = NULL,
  study_type = NULL,
```

```

allocation = NULL,
intervention_model = NULL,
observational_model = NULL,
primary_purpose = NULL,
time_perspective = NULL,
masking_description = NULL,
sampling_method = NULL,
phase = NULL,
gender = NULL,
sponsor_type = NULL,
ignore_case = TRUE,
match_all = FALSE
)

```

Arguments

<code>data</code>	a dataset to search over; set to NULL to use the full dataset that is currently loaded
<code>description_kw</code>	character vector of keywords to search in the intervention description field. Set to NULL to avoid searching this field.
<code>sponsor_kw</code>	character vector of keywords to search in the sponsor (the company that submitted the study). Set to NULL to avoid searching this field.
<code>brief_title_kw</code>	character vector of keywords to search in the brief title field. Set to NULL to avoid searching this field.
<code>official_title_kw</code>	character vector of keywords to search in the official title field. Set to NULL to avoid searching this field.
<code>criteria_kw</code>	character vector of keywords to search in the criteria field. Set to NULL to avoid searching this field.
<code>intervention_kw</code>	character vector of keywords to search in the intervention names field. Set to NULL to avoid searching this field.
<code>intervention_desc_kw</code>	character vector of keywords to search in the intervention description field. Set to NULL to avoid searching this field.
<code>outcome_kw</code>	character vector of keywords to search in the outcome measures field. Set to NULL to avoid searching this field.
<code>outcome_desc_kw</code>	character vector of keywords to search in the outcome description field. Set to NULL to avoid searching this field.
<code>conditions_kw</code>	character vector of keywords to search in the conditions field. Set to NULL to avoid searching this field.
<code>population_kw</code>	character vector of keywords to search in the population field. Set to NULL to avoid searching this field.
<code>date_range</code>	string of length two formatted as "YYYY-MM-DD" describing the earliest and latest data to include in the results. Use a missing value for either value search all dates. Set to NULL to avoid searching this field.

enrollment_range	numeric of length two describing the smallest and largest enrollment sizes to include in the results. Use a missing value for either value to avoid filtering. Set to NULL to avoid searching this field.
minimum_age_range	numeric of length two describing the smallest and largest minimum age (in years) to include in the results. Use a missing value for either value to avoid filtering. Set to NULL to avoid searching this field.
maximum_age_range	numeric of length two describing the smallest and largest maximum age (in years) to include in the results. Use a missing value for either value to avoid filtering. Set to NULL to avoid searching this field.
study_type	character vector of study types to include in the output. Set to NULL to avoid searching this field.
allocation	character vector of allocations to include in the output. Set to NULL to avoid searching this field.
intervention_model	character vector of interventions to include in the output. Set to NULL to avoid searching this field.
observational_model	character vector of observations to include in the output. Set to NULL to avoid searching this field.
primary_purpose	character vector of primary purposes to include in the output. Set to NULL to avoid searching this field.
time_perspective	character vector of time perspectives to include in the output. Set to NULL to avoid searching this field.
masking_description	character vector of maskings to include in the output. Set to NULL to avoid searching this field.
sampling_method	character vector of sampling methods to include in the output. Set to NULL to avoid searching this field.
phase	character vector of phases to include in the output. Set to NULL to avoid searching this field.
gender	character vector of genders to include in the output. Set to NULL to avoid searching this field.
sponsor_type	character vector of sponsor types to include in the output. Set to NULL to avoid searching this field.
ignore_case	logical. Should the search ignore capitalization. The default is TRUE.
match_all	logical. Should the results required matching all the keywords? The default is FALSE.

Value

a tibble object queried from the loaded database

Author(s)

Taylor B. Arnold, <taylor.arnold@acm.org>

ctgov_query_terms	<i>Query the ClinicalTrials.gov dataset</i>
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Description

Returns a list showing the available category levels for querying the data with the ctgov_query function.

Usage

```
ctgov_query_terms()
```

Value

a named list of allowed categorical values for the query

ctgov_schema	<i>Get and Set the Default Schema</i>
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Description

This function sets the schema in which tables in which the CT Trials tables reside.

Get the current schema either of the following.

```
ctgov_schema() ctgov_get_schema()
```

Set the current schema with the following.

```
ctgov_schema(<SCHEMA NAME>) ctgov_set_schema(<SCHEMA NAME>)
```

A return of "" from the get functions indicates a schema is not specified.

Usage

```
ctgov_schema(schema = NULL)
```

Arguments

schema the name of the schema. (Default is NULL - None)

Value

no return value; used for side effects

ctgov_text_similarity *Similarity Matrix*

Description

Takes one or more vectors of text and returns a similarity matrix.

Usage

```
ctgov_text_similarity(  
  ...,  
  max_terms = 10000,  
  tolower = TRUE,  
  min_df = 0,  
  max_df = 1  
)
```

Arguments

...	one or more vectors of text to search; must all be the same length
max_terms	maximum number of terms to consider for keywords
tolower	should keywords respect the case of the raw terms
min_df	minimum proportion of documents that a term should be present in to be included in the keywords
max_df	maximum proportion of documents that a term should be present in to be included in the keywords

Value

a distance matrix

ctgov_tfidf *TF-IDF Keywords*

Description

Takes one or more vectors of text and returns a vector of keywords.

Usage

```
ctgov_tfidf(
  ...,
  max_terms = 10000,
  tolower = TRUE,
  nterms = 5L,
  min_df = 0,
  max_df = 1
)
```

Arguments

...	one or more vectors of text to search; must all be the same length
max_terms	maximum number of terms to consider for keywords
tolower	should keywords respect the case of the raw terms
nterms	number of keyword terms to include
min_df	minimum proportion of documents that a term should be present in to be included in the keywords
max_df	maximum proportion of documents that a term should be present in to be included in the keywords

Value

a character vector of detected keywords

ctgov_to_plotly	<i>Convert a cttrials.gov Visualization to Plotly</i>
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Description

Convert a cttrials.gov Visualization to Plotly

Usage

```
ctgov_to_plotly(p, ...)
```

Arguments

p	the plot returned by 'ctgov_plot_timeline()'
...	currently not used.

Value

a Plotly object

has_term	<i>Does a Term Appear in a Vector of Strings?</i>
----------	---

Description

Does a Term Appear in a Vector of Strings?

Usage

```
has_term(s, pattern, ignore_case = TRUE)
```

Arguments

s	the vector of strings.
pattern	the pattern to search for.
ignore_case	should the case be ignored? Default TRUE

Value

a single logical value

tbl_join_sample	<i>Sample Clinical Trials Dataset</i>
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Description

Data frame containing a 2.5 percent random sample of clinical trials.

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