Package ‘wosr’

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Type Package

Title Clients to the 'Web of Science' and 'InCites' APIs

Description R clients to the 'Web of Science' and 'InCites'
<https://clarivate.com/products/data-integration/> APIs, which
allow you to programmatically download publication and citation data
indexed in the 'Web of Science' and 'InCites' databases.


BugReports https://github.com/vt-arc/wosr/issues

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Depends R (>= 3.1)

Imports httr, xml2, jsonlite, pbapply, utils, tools

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Suggests testthat, knitr, rmarkdown, dplyr

NeedsCompilation no

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R topics documented:

  auth ................................................................. 2
  create_ut_queries ............................................. 3
  pull_cited.refs ............................................. 3
  pull_incites ................................................. 4
  pull_related.recs .......................................... 5
auth

Authenticate user credentials

Description

auth asks the API's server for a session ID (SID), which you can then pass along to either query_wos or pull_wos. Note, there are limits on how many session IDs you can get in a given period of time (roughly 5 SIDs in a 5 minute period).

Usage

auth(username = sys.getenv("WOS_USERNAME"),
      password = sys.getenv("WOS_PASSWORD"))

Arguments

username  Your username. Specify username = NULL if you want to use IP-based authentication.
password  Your password. Specify password = NULL if you want to use IP-based authentication.

Value

A session ID

Examples

## Not run:

# Pass user credentials in manually:
auth("some_username", password = "some_password")

# Use the default of looking for username and password in envvars, so you # don't have to keep specifying them in your code:
Sys.setenv(WOS_USERNAME = "some_username", WOS_PASSWORD = "some_password")
auth()

## End(Not run)
create_ut_queries

Create a vector of UT-based queries

Description
Use this function when you have a bunch of UTs whose data you want to pull and you need to write a series of UT-based queries to do so (i.e., queries in the form "UT = (WOS:000186387100005 OR WOS:000179260700001)").

Usage
create_ut_queries(uts, uts_per_query = 200)

Arguments
- uts: UTs that will be placed inside the UT-based queries.
- uts_per_query: Number of UTs to include in each query. Note, there is a limit on how long your query can be, so you probably want to keep this set to around 200.

Value
A vector of queries. You can feed these queries to pull_wos_apply to download data for each query.

Examples
## Not run:
data <- pull_wos('TS = ("animal welfare") AND PY = (2002-2003)')
queries <- create_ut_queries(data$publication$ut)
pull_wos_apply(queries)

## End(Not run)

pull_cited_refs

Pull cited references

Description
Pull cited references

Usage
pull_cited_refs(uts, sid = auth(Sys.getenv("WOS_USERNAME"),
Sys.getenv("WOS_PASSWORD")), ...)


Arguments

uts Vector of UTs (i.e., publications) whose cited references you want.

sid Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to auth. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.

Value

A data frame with the following columns:

- **ut** The publication that is doing the citing. These are the UTs that you submitted to pull_cited.refs.
  - If one of your publications doesn’t have any cited refs, it will not appear in this column.
- **doc_id** The cited ref’s document identifier (similar to a UT).
- **title** Roughly equivalent to the cited ref’s title.
- **journal** Roughly equivalent to the cited ref’s journal.
- **author** The cited ref’s first author.
- **tot_cites** The total number of citations the cited ref has received.
- **year** The cited ref’s publication year.
- **page** The cited ref’s page number.
- **volume** The cited ref’s journal volume.

Examples

```
## Not run:

sid <- auth("your_username", password = "your_password")
uts <- c("WOS:00036231260021", "WOS:000439855300830", "WOS:00029494690020")
pull_cited.refs(uts, sid)

## End(Not run)
```

pull_incites Pull data from the InCites API

Description

**Important note:** The throttling limits on the InCites API are not documented anywhere and are difficult to determine from experience. As such, whenever pull_incites receives a throttling error from the server, it uses exponential backoff (with a maximum wait time of 45 minutes) to determine how long to wait before retrying.

Usage

```
pull_incites(uts, key = Sys.getenv("INCITES_KEY"), as_raw = FALSE, ...)
```
**Arguments**

- **uts**: A vector of UTs whose InCites data you would like to download. Each UT is a 15-digit identifier for a given publication. You can specify the UT using only these 15 digits or you can append the 15 digits with "WOS:" (e.g., "000346263300011" or "WOS:000346263300011").

- **key**: The developer key that the server will use for authentication.

- **as_raw**: Do you want the data frame that is returned by the API to be returned to you in its raw form? This option can be useful if the API has changed the format of the data that it is serving, in which case specifying `as_raw = TRUE` may avoid an error that would otherwise occur during pull_incites's data processing step.

... Arguments passed along to `GET`.

**Value**

A data frame where each row corresponds to a different publication. The definitions for the columns in this data frame can be found online at the API's documentation page (see the DocumentLevelMetricsByUT method details for definitions). Note that the column names are all converted to lowercase by pull_incites and the 0/1 flag variables are converted to booleans. Also note that not all publications indexed in WoS are also indexed in InCites, so you may not get data back for some UTs.

**Examples**

```r
## Not run:

uts <- c(
  "WOS:000346263300011", "WOS:000362312600021", "WOS:000279885800004",
  "WOS:000294667500003", "WOS:000294969000020", "WOS:000412659200006"
)
pull_incites(uts, key = "some_key")

pull_incites(c("000346263300011", "000362312600021"), key = "some_key")

## End(Not run)
```

**Description**

Pull the records that have at least one citation in common with a publication of interest.

**Usage**

```r
pull_related_recs(uts, num_recs, editions = c("SCI", "SSCI", "AHCI", "ISTP", "ISSHP", "BSCI", "BHCI", "IC", "CCR", "ESCI"),
  sid = auth(Sys.getenv("WOS_USERNAME"), Sys.getenv("WOS_PASSWORD")),
  ...
```
Arguments

uts
The documents whose related records you want to pull.

num_recs
Number of related records to pull for each UT. This value must be <= 100.

editions
Web of Science editions to query. Possible values are listed here.

sid
Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to auth. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.

... Arguments passed along to POST.

Value

A data frame with the following columns:

ut
The publications that you passed into pull_related_recs. If one of your publications doesn’t have any related records, it won’t appear here.

related_rec
The publication that is related to ut.

rec_num
The related record’s ordering in the result set returned by the API. Records that share more citations with your UTs will have smaller rec_nums.

Examples

```r
## Not run:

sid <- auth("your_username", password = "your_password")
uts <- c("WOS:00027287700013", "WOS:0002736800825")
out <- pull_related_recs(uts, 5, sid = sid)

## End(Not run)
```

---

**pull_wos**

*Pull data from the Web of Science*

Description

pull_wos wraps the process of querying, downloading, parsing, and processing Web of Science data.

Usage

```r
pull_wos(query, editions = c("SCI", "SSCI", "AHCI", "ISTP", "ISSHP", "BSCI", "BHCI", "IC", "CCR", "ESCI"),
          sid = auth(Sys.getenv("WOS_USERNAME"), Sys.getenv("WOS_PASSWORD")),
          ...
```

---
Arguments

query Query string. See the WoS query documentation page for details on how to write a query as well as this list of example queries.
editions Web of Science editions to query. Possible values are listed here.
sid Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to auth. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.

Value

A list of the following data frames:

- publication A data frame where each row corresponds to a different publication. Note that each publication has a distinct ut. There is a one-to-one relationship between a ut and each of the columns in this table.

- author A data frame where each row corresponds to a different publication/author pair (i.e., a ut/author_no pair). In other words, each row corresponds to a different author on a publication. You can link the authors in this table to the address and author_address tables to get their addresses (if they exist). See example in FAQs for details.

- address A data frame where each row corresponds to a different publication/address pair (i.e., a ut/addr_no pair). In other words, each row corresponds to a different address on a publication. You can link the addresses in this table to the author and author_address tables to see which authors correspond to which addresses. See example in FAQs for details.

- author_address A data frame that specifies which authors correspond to which addresses on a given publication. This data frame is meant to be used to link the author and address tables together.

- jsc A data frame where each row corresponds to a different publication/jsc (journal subject category) pair. There is a many-to-many relationship between ut’s and jsc’s.

- keyword A data frame where each row corresponds to a different publication/keyword pair. These are the author-assigned keywords.

- keywords_plus A data frame where each row corresponds to a different publication/keywords_plus pair. These keywords are the keywords assigned by Clarivate Analytics through an automated process.

- grant A data frame where each row corresponds to a different publication/grant agency/grant ID triplet. Not all publications acknowledge a specific grant number in the funding acknowledgement section, hence the grant_id field can be NA.

- doc_type A data frame where each row corresponds to a different publication/document type pair.

Examples

```r
## Not run:

sid <- auth("your_username", password = "your_password")
pull_wos("TS = (dog welfare) AND PY = 2010", sid = sid)
```
# Re-use session ID. This is best practice to avoid throttling limits:
pull_wos("TI = ""dog welfare\"", sid = sid)

# Get fresh session ID:
pull_wos("TI = ""pet welfare\"", sid = auth("your_username", "your_password")

# It's best to see how many records your query matches before actually
downloading the data. To do this, call query_wos before running pull_wos:
query <- "TS = ((cadmium AND gill*) NOT Pisces)"
query_wos(query, sid = sid) # shows that there are 1,611 matching publications
pull_wos(query, sid = sid)

## End(Not run)

---

**pull_wos_apply**  
*Run pull_wos across multiple queries*

### Description

Run pull_wos across multiple queries

### Usage

```r
pull_wos_apply(queries, editions = c("SCI", "SSCI", "AHCI", "ISTP", "ISSHP", "BSCI", "BHCI", "IC", "CCR", "ESCI"), sid = auth(Sys.getenv("WOS_USERNAME"), Sys.getenv("WOS_PASSWORD")), ...
```

### Arguments

- **queries**: Vector of queries to issue to the WoS API and pull data for.
- **editions**: Web of Science editions to query. Possible values are listed [here](#).
- **sid**: Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to `auth`. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.
- ... Arguments passed along to `POST`.

### Value

The same set of data frames that `pull_wos` returns, with the addition of a data frame named `query`. This data frame tells you which publications were returned by a given query.
**query_wos**  
*Query the Web of Science*

## Description

Returns the number of records that match a given query. It’s best to call this function before calling `pull_wos` so that you know how many records you’re trying to download before attempting to do so.

## Usage

```r
query_wos(query, editions = c("SCI", "SSCI", "AHCI", "ISTP", "ISSHP", "BSCI", "BHCI", "IC", "CCR", "ESCI"),  
  sid = auth(Sys.getenv("WOS_USERNAME"), Sys.getenv("WOS_PASSWORD")),  
  ...)  
```

## Arguments

- **query**: Query string. See the WoS query documentation page for details on how to write a query as well as this list of example queries.
- **editions**: Web of Science editions to query. Possible values are listed [here](https://example.com/editions).
- **sid**: Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to `auth`. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.
- ... Arguments passed along to `POST`.

## Value

An object of class `query_result`. This object contains the number of publications that are returned by your query (`rec_cnt`), as well as some info that `pull_wos` uses when it calls `query_wos` internally.

## Examples

```r
## Not run:
queries <- c('TS = "dog welfare"', 'TS = "cat welfare"')
# we can name the queries so that these names appear in the queries data
# frame returned by pull_wos_apply():
names(queries) <- c("dog welfare", "cat welfare")
pull_wos_apply(queries)

## End(Not run)
```
### Examples

#### Not run:

```r
# Get session ID and reuse it across queries:
sid <- auth("some_username", password = "some_password")

query_wos("TS = \"dog welfare\"\ AND PY = (1990-2007)\", sid = sid)

# Finds records in which Max Planck appears in the address field.
query_wos("AD = Max Planck", sid = sid)

# Finds records in which Max Planck appears in the same address as Mainz
query_wos("AD = (Max Planck SAME Mainz)\", sid = sid)

## End(Not run)
```

---

### query_wos_apply

**Run query_wos across multiple queries**

#### Description

Run `query_wos` across multiple queries

#### Usage

```r
query_wos_apply(queries, editions = c("SCI", "SSCI", "AHCI", "ISTP", "ISSHP", "BSCI", "BHCI", "IC", "CCR", "ESCI"),
                 sid = auth(Sys.getenv("WOS_USERNAME"), Sys.getenv("WOS_PASSWORD")),
                 ...
```

#### Arguments

- `queries` Vector of queries run.
- `editions` Web of Science editions to query. Possible values are listed [here](#).
- `sid` Session identifier (SID). The default setting is to get a fresh SID each time you query WoS via a call to `auth`. However, you should try to reuse SIDs across queries so that you don’t run into the throttling limits placed on new sessions.
- `...` Arguments passed along to `POST`.

#### Value

A data frame which lists the number of records returned by each of your queries.
Examples

```r
# Not run:
queries <- c('TS = "dog welfare", 'TS = "cat welfare"')
query_wos_apply(queries)

# End(Not run)
```

**Description**

Reads in a series of CSV files (which were written via `write_wos_data`) and places the data in an object of class `wos_data`.

**Usage**

```r
read_wos_data(dir)
```

**Arguments**

- `dir` Path to the directory where you wrote the CSV files.

**Value**

An object of class `wos_data`.

**Examples**

```r
# Not run:
sid <- auth("your_username", password = "your_password")
wos_data <- pull_wos("TS = (dog welfare) AND PY = 2010", sid = sid)

# Write files to working directory
write_wos_data(wos_data, ".")
# Read data back into R
wos_data <- read_wos_data(".")

# End(Not run)
```

**Description**

`wosr`
write_wos_data  Write WoS data

Description

Writes each of the data frames in an object of class wos_data to its own csv file.

Usage

write_wos_data(wos_data, dir)

Arguments

wos_data  An object of class wos_data, created by calling pull_wos.
dir  Path to the directory where you want to write the files. If the directory doesn’t yet exist, write_wos_data will create it for you. Note, this directory cannot already have WoS data files in it.

Value

Nothing. Files are written to disk.

Examples

## Not run:

sid <- auth("your_username", password = "your_password")
wos_data <- pull_wos("TS = (dog welfare) AND PY = 2010", sid = sid)

# Write files to working directory
write_wos_data(wos_data, ".")

# Write files to "wos-data" dir
write_wos_data(wos_data, "wos-data")

## End(Not run)
Index

auth, 2, 4, 6–10
create_ut_queries, 3
GET, 5
POST, 4, 6–10
pull_cited.refs, 3
pull_incites, 4
pull_related_recs, 5
pull_wos, 2, 6, 8, 9, 12
pull_wos_apply, 3, 8
query_wos, 2, 9
query_wos_apply, 10
read_wos_data, 11
wos, 11
wosr-package (wosr), 11
write_wos_data, 11, 12