Package 'sgapi'

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Title Aid Querying 'nomis' and 'Office for National Statistics Open Geography' APIs

Version 1.1.0

Description Facilitates extraction of geospatial data from the 'Office for National Statistics Open Geography' and 'nomis' Application Programming Interfaces (APIs). Simplifies process of querying 'nomis' datasets <https://www.nomisweb.co.uk/> and extracting desired datasets in dataframe format. Extracts area shapefiles at chosen resolution from 'Office for National Statistics Open Geography' <https://geoportal.statistics.gov.uk/>.

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Encoding UTF-8

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URL https://defra-data-science-centre-of-excellence.github.io/sgapi/, https://github.com/Defra-Data-Science-Centre-of-Excellence/sgapi

BugReports https://github.com/Defra-Data-Science-Centre-of-Excellence/sgApi/issues

Imports magrittr, sf, dplyr, httr, readr, xml2, methods

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Contents

`assert_function` *Escape Function in Case of Errors*

Description

Evaluate condition and return error message if condition not satisfied.

Usage

```
assert_function(condition, msg)
```

Arguments

`condition`	a logical expresssion (e.g. is.null(test_variable))
`msg`	the error message returned if the condition is not met.

Value

No return value, called for side effects.

Examples

```
assert_function(1==2,"Incorrect inequality")
```

`availableBoundaries.rda` *List of available ONS boundaries*

Description

A list of the available boundary layers that the Office for National Statistics (ONS) has for ArcGIS queries

Usage

```
availableBoundaries
```

Format

A list of with 3348 rows and 1 variable:

boundary name of boundary table within 'ONS Open geography'

Source

availableBoundaries.rda

`build_constituency_query_string` *Build constituency section of get_boundary_areaname query string*

Description

Create correctly formatted 'where' part of url query string used by get_boundary_areaname to fetch contituency boundaries

Usage

```
build_constituency_query_string(constituency_list, ...)
```

Arguments

`constituency_list`	Vector of constituency names
`...`	Additional strings to be added to the query string

Value

A string formatted for 'where' portion of url for querying Open Geography portal

Examples

```
build_constituency_query_string("Westminster", "LAD22NM", "3D")
"%20(%20'LAD22NM%20%3D%20'Westminster')%20"

build_constituency_query_string(c("Westminster", "Tower Hamlets"), "LAD22NM", "3D")
"%20(%20'LAD22NM%20%3D%20'Westminster'%20OR%20LAD22NM%20%3D%20'Tower%20Hamlets')%20"
```

---

build_url_query_string

Build URL Query String

Description

Takes named arguments (...) and creates a URL query string starting with 'prefix' with each named pair of arguments separated with 'sep' and each item within a value that is a vector separated by 'value_sep'.

Each value part of the named arguments must be coercible to character. For example, list(key1 = "value1", key2 = 42, key3 = c(1, 2, 4)) would be acceptable as it can all be coerced to characters

Usage

```
build_url_query_string(prefix = "?", sep = "&", value_sep = ",", ...)
```

Arguments

`prefix`	Prefix to returned URL. Defaults to "?".
`sep`	. String separating used to separate in the URL output each named argument in (...). Defaults to "&".
`value_sep`	String separating each item in value if the value part of a named argument is a vector. Defaults to ",".
`...`	Any number of named argument pairs where the value must be coercible to character

Value

A string containing the named arguments parsed into the URL query string format

Examples

```
build_url_query_string()
""
build_url_query_string(field1 = "option1")
"?field1=option1"
build_url_query_string(field1 = "option1", field2 = 42, field3 = c(1, 2, 3))
"?field1=option1&field2=42&field3=1,2,3"
build_url_query_string(prefix = "/query?", sep = "|", value_sep = ":",
                       field1 = 1, field2 = c(7, 8, 9))
"/query?field1=1|field2=7:8:9"
```

---

get_available_scales *Available Boundary Scales for 'nomis' Table*

Description

Retrieve available spatial scales for a given 'nomis' table id. This is useful as each table only has data at a specific set of scales, e.g. many census tables are available at MSOA and LSOA resolutions but not at Regional level.

Usage

```
get_available_scales(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

id	A valid 'nomis' table id given as a string.
base_url	Nomis API base url

Value

A tidy dataframe listing the geographical scales available for the 'nomis' table selected.

Examples

```
get_available_scales(id="NM_1003_1")
```

get_boundaries *Get Boundaries Using Geospatial Filter*

Description

Retrieve boundaries from the Office for National Statistics (ONS) 'ONS Geography Portal' given a valid boundary name and layer name. If the submitted geometry is outwith the ONS Boundary, e.g. the geometry is in France, the function will return an empty shape file.

Usage

```
get_boundaries(boundary, geometry_filter = NULL,
base_url = "https://services1.arcgis.com/ESMARspQHYMw9BZ9/arcgis/rest/services")
```

Arguments

boundary	A valid ONS boundary name given as a string.
geometry_filter	geospatial shape or point (using latitude and longitude). Currently limited to a rectangular box or dropped pin.
base_url	Open Geography Portal base url

Value

An sf object for all constituencies in the geospatial area submitted through the geometry_filter, at the chosen ONS Boundary.

Examples

```
## Not run:
get_boundaries(boundary="MSOA_Dec_2011_Boundaries_Generalised_Clipped_BGC_EW_V3_2022",
geometry_filter="-1.282825,52.354169,0.206626,52.7106")

## End(Not run)
```

get_boundaries_areaname *Get Boundaries Using Area Names*

Description

Extract a geojson shapefile of the chosen areas at the user-selected resolution.

Usage

```
get_boundaries_areaname(boundary, col_name_var, chosen_constituency_list,
base_url = "https://services1.arcgis.com/ESMARspQHYMw9BZ9/arcgis/rest/services")
```

Arguments

boundary	The resolution of constituencies, e.g. Census Output Areas or Westminster Constituencies. Available boundaries can be found here: https://geoportal.statistics.gov.uk/
col_name_var	The name of the datafield where the constituency name is held, e.g. PCON22NM for 2022 Parliamentary Constituencies.
chosen_constituency_list	List of chosen constituencies.
base_url	Open geography portal base url

Value

An sf object of the constituencies submitted to the function. If there are no constituencies, return is NULL.

Examples

```
get_boundaries_areaname(boundary="Local_Authority_Districts_December_2022_UK_BGC_V2",
col_name_var="LAD22NM",chosen_constituency_list=c("Westminster","Tower Hamlets","County Durham"))
```

---

get_keyword_table_id *Keyword Search of 'nomis'*

Description

Function to return dataframe of all 'nomis' tables, and their corresponding codes and descriptions, which have the chosen keyword.

Usage

```
get_keyword_table_id(
  usr_keyword,
  base_url = "https://www.nomisweb.co.uk/api/v01"
)
```

Arguments

usr_keyword	Keyword to search 'nomis' tables for, e.g. "religion", "employment", "housing"
base_url	nomis url to query

Value

A tidy dataframe of all nomis tables and their ids, which contain the chosen keyword.

Examples

```
get_keyword_table_id(usr_keyword="passports")
```

`get_ons_table` *Get ONS data*

Description

Retrieve data from the Office of National Statistics (ONS) via the Nomis API for a given dataset.

Usage

```
get_ons_table(
  id,
  base_url = "https://www.nomisweb.co.uk/api/v01",
  csv_parser_fnc = utils::read.csv,
  ...
)
```

Arguments

`id`	a table ID recognised by 'nomis' (e.g. "NM_1_1")
`base_url`	Nomis base url to query. Default: "https:www.nomisweb.co.uk/api/v01"
`csv_parser_fnc`	Function for parsing the csv file from Nomis API url. Default: read.csv
`...`	Additional parameters used to filter and aggregate the data retrieved from ONS. These are passed to build_url_query_string to build everything in the url after "?". See "https://www.nomisweb.co.uk/api/v01/help for information on the options available

Value

A dataframe containing the data downloaded from ONS' Nomis API

Examples

```
# Pull all data from the "Jobseeker's Allowance" dataset
## Not run: get_ons_table("nm_1_1")
# Filter "Jobseeker's Allowance" dataset and select columns to output ('select')
get_ons_table("nm_1_1", geography = "TYPE480", time = "latest", measures = 20100, item = 1,
              select = c("geography_name", "sex_name", "obs_value"))

# Aggregate statistics using 'rows' and 'cols'
get_ons_table("nm_1_1",
```

```
geography = "TYPE480", time = "latest", measures = 20100, item = 1,
select = c("geography_name", "sex_name", "obs_value"),
rows = c("geography_name"), cols = c("sex_name"))
```

`get_overview` *Table Overview*

Description

Retrieve dataset overview for a valid 'nomis' table id. Returned object includes description of the dataset, last update date, contact for the data. It also extracts all of the available instances of the available table dimensions, which can then be used to filter the dataset 'nomis' table.

Usage

```
get_overview(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

`id`	A valid 'nomis' id.
`base_url`	Base nomis url to query

Value

An object with overview information of chosen data set. Object has the structure of the extracted JSON object.

Examples

```
get_overview(id="NM_1_1")
```

`get_structure` *Extract 'nomis' Table Data for Chosen Dimension*

Description

Retrieve dataset for a valid 'nomis' table id and dimension. This extracts all of the available instances of the chosen dimension, which can then be used to filter the 'nomis' table.

Usage

```
get_structure(id, dim, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

id	A valid 'nomis' id.
dim	The name of the g which dimension is queried.
base_url	Base nomis url to query

Value

An object with JSON structure for the chosen dimension of the selected 'nomis' table.

Examples

```
get_structure(id="NM_187_1",dim="industry")
```

---

get_table *Get 'nomis' Table*

Description

Retrieve a 'nomis' table, containing the columns of interest, using a given table ID. Option to apply filters to the query, and to circumnavigate the limit on number of rows returned using your 'nomis' uid.

Usage

```
get_table(
  id,
  options,
  selection = NULL,
  uid = NULL,
  base_url = "https://www.nomisweb.co.uk/api/v01"
)
```

Arguments

id	a table ID recognised by 'nomis' (e.g. "NM_1_1")
options	a list of paramaters to pass to the API query.
selection	a vector of column names to return. NULL returns all. Defaults to NULL.
uid	Unique 'nomis' identifier to enable larger 'nomis' queries - https://www.nomisweb.co.uk/. Defaults to NULL.
base_url	Nomis base url to query

Value

A tidy dataframe of selected 'nomis' table with the selected parameters and user filters applied.

Examples

```
get_table(id="NM_1_1", options = list("geography" = "TYPE480", "time" = "latest"))
get_table(id="NM_1002_1", options = list("geography" = "TYPE265", "time" = "latest"),
selection = "GEOGRAPHY_NAME,C_AGE_NAME,OBS_VALUE",uid=NULL)
```

---

get_table_dimensions *Table Dimensions*

Description

Extract dimensions available for a given 'nomis' table ID. e.g. the dimensions of the table 'RM011 - Country of birth by age ' are age, country and geography; this function will return all of the available age, country and geography filters available on the table.

Usage

```
get_table_dimensions(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

id	A table ID recognised by 'nomis' (e.g "NM_1_1").
base_url	Nomis API base url

Value

A tidy dataframe of the dimensions, and available filtering values, of your chosen 'nomis' table.

Examples

```
get_table_dimensions(id="NM_1240_1")
```

---

get_table_id *Get 'nomis 'Table IDs*

Description

Extract unique table ids for 'nomis' tables containing given name in their title, these unique table ids can be used to rapidly query census data in other functions e.g. 'get_overview("NM_102_1")'

Usage

```
get_table_id(name, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

name	A string to search for within 'nomis' table titles.
base_url	Nomis API base url

Value

A dataframe of 'nomis' table codes and names, as strings, for all 'nomis' tables containing the selected 'name' in their title.

Examples

```
get_table_id(name="employment")
```

---

get_table_info_brief *Key 'nomis' Table Information*

Description

Retrieve summary information about a given 'nomis' dataset. This is useful as it provides the description of the dataset and any caveats. It also returns information about the current status of the data, and when it was last updated.

Usage

```
get_table_info_brief(id, base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

id	A valid 'nomis' table id given as a string, e.g. NM_46_1.
base_url	Base nomis url to query

Value

A json file containing the DatasetInfo, DatasetMetadata, Dimensions (variables), Dataset Contact, Units from the target 'nomis' table.

Examples

```
get_table_info_brief(id="NM_1_1")
```

get_table_link_lookup *Lookup Between Boundary Scales*

Description

Extract a lookup table between two boundary scales from 'ONS Open Geography' portal, e.g. get a lookup between Regions and Parliamentary constituencies.

Usage

```
get_table_link_lookup(
  lookup_table,
  col_name_1,
  col_name_2,
  col_name_3,
  col_name_4,
 base_url = "https://services1.arcgis.com/ESMARspQHYMw9BZ9/arcgis/rest/services"
)
```

Arguments

lookup_table	A valid ONS lookup table
col_name_1	Field in ONS table containing the constituency code of the smaller scale resolution.
col_name_2	Field in ONS table containing the constituency code of the larger scale resolution.
col_name_3	Field in ONS table containing the constituency name of the smaller scale resolution.
col_name_4	Field in ONS table containing the constituency name of the larger scale resolution.
base_url	Open geography portal base url

Value

A tidy dataframe, providing a lookup between two chosen boundary resolutions.

Examples

```
## Not run:
get_table_link_lookup(lookup_table="LAD22_CTY22_EN_LU",col_name_1="LAD22CD",
col_name_2="CTY22CD",col_name_3="LAD22NM",col_name_4="CTY22NM")

## End(Not run)
```

list_boundaries *List Available Boundaries*

Description

Retrieve all available ArcGIS boundary layers from the 'ONS Open Geography Portal'.

Usage

```
list_boundaries(
 base_url = "https://services1.arcgis.com/ESMARspQHYMw9BZ9/arcgis/rest/services"
)
```

Arguments

base_url	Open geography portal base url

Value

A vector of available boundary layers on 'ONS Open Geography'.

list_data_sources *List 'nomis' Data Sources*

Description

Return a list of the data sources available on 'nomis'.

Returns a list including the name, id and description of each data source available on 'nomis'. More information can be found here: https://www.nomisweb.co.uk/api/v01/help

Usage

```
list_data_sources(base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

base_url	Base nomis url to query

Value

A tidy dataframe of all available data sources accessible through the 'nomis' API system.

Examples

```
list_data_sources()
```

list_tables *Available 'nomis' Tables*

Description

List all available datasets on 'nomis'. User can then use the items on this list to query 'nomis' data.

Usage

```
list_tables(base_url = "https://www.nomisweb.co.uk/api/v01")
```

Arguments

base_url	Url of the API from which the available tables are listed.

Value

A tidy dataframe containing the name and ID of each table available on 'nomis'.

lookup.rda *Lookup to match Office for National Statistics (ONS) and 'nomis' boundary names*

Description

Lookup table providing ONS and 'nomis' references for a given ONS boundary layer. The variables are as follows:

Usage

```
lookup
```

Format

A data frame with 30 rows and 4 variables:

resolution boundary layer, written in interpretable manner

ons corresponding boundary layer in the format that the 'ONS Open Geography' API will interpret

nomis corresponding boundary layer in the format that the 'nomis' API will interpret

Names_and_Codes lookup file containing the constituency names and codes of the boundary layer

Source

lookup.rda

nomisTables.rda *#' List of tables on 'nomis'*

Description

A dataset containing the available tables, codes and sources of data available on 'nomis'. The variables are as follows:

Usage

```
nomisTables
```

Format

A data frame with 1605 rows and 3 variables:

name name of dataset

id code corresponing to dataset

sourceName source of dataset

Source

nomisTables.rda

scalesForEachDataset.rda *#' List of tables available at each ONS resolution*

Description

A dataset containing the available tables on 'nomis', and the boundary layers at which this data is held, e.g. demographic information may only be held in the Census output areas and not NHS regions. The variables are as follows:

Usage

```
scalesForEachDataset
```

Format

A data frame with 22564 rows and 3 variables:

name name of boundary layer

value type of data

table nomis code for the table

Source

scalesForEachDataset.rda

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