

Package ‘INEbaseR’

June 10, 2019

Type Package

Title R package for obtaining and analyzing open data from INE
(Instituto Nacional de Estadística) API

Version 0.1.0

Date 2018-01-01

Maintainer Andres Nacimiento <andresnacimiento@gmail.com>

Description R package for obtaining and analyzing open data from INE (Instituto Nacional de Estadística) API.

License GPL (>= 3)

Encoding UTF-8

LazyData false

BuildResaveData false

Imports jsonlite, highcharter

RoxygenNote 6.1.1

NeedsCompilation no

Author Andres Nacimiento [aut, prg, cre],
Mariano Sanz [ctg],
Carlos J. Perez [aut, drt, pdr]

R topics documented:

convert_natcode_to_geocode	2
draw_serie	3
get_cache_rds	3
get_data_metadataoperation	4
get_data_serie	5
get_data_table	5
get_frequency	6
get_geographical_variable	6
get_natcode	7
get_operation	7
get_operations_all	8
get_operations_by_granularity	8
get_publications	9
get_publications_date	9

get_publications_operation	10
get_serie	10
get_series_by_common_parameters	11
get_series_by_granularity	11
get_series_metadataoperation	12
get_series_operation	13
get_series_table	14
get_series_values	14
get_serie_nult	15
get_tables_group	15
get_tables_group_values	16
get_tables_operation	16
get_values_all	17
get_values_variableoperation	17
get_variables_all	18
get_variables_operation	18
get_var_values_operation	19
highcharts_series	19
plot_series	20
update_cache	20
update_series	21

Index	22
--------------	-----------

convert_natcode_to_geocode

Convert Natcode to Geocode

Description

This function allows converting from natcode to geocode and vice-versa. If all params are null, you will get the complete table used for codes conversion.

Usage

```
convert_natcode_to_geocode(natcode = NULL, geocode = NULL,
    exponential_notation = FALSE)
```

Arguments

natcode	(int) geographical code from INE
geocode	(string) geographical code from Eurostat
exponential_notation	(boolean) to show or not exponential notation. e.g. e+10

Examples

```
convert_natcode_to_geocode()
convert_natcode_to_geocode(natcode = 34050000000)
convert_natcode_to_geocode(geocode = "ES70")
```

draw_serie	<i>Draw serie</i>
------------	-------------------

Description

This function allows representing series data into a map

Usage

```
draw_serie(serie, nult = 0, classification = NULL, map_scale = 60,
  verbose = FALSE, benchmark = FALSE)
```

Arguments

serie	(string) serie id
nult	(int) last n serie data, if nult = 0 this value will be auto-calculated
classification	(string) serie classification, if classification = NULL this value will be auto-detected
map_scale	(int) refers to the relationship or ratio between distance on a map and the corresponding distance on the ground. For example, on a 1:1000000 scale map, 1cm on the map equals 1km on the ground. Possible values are: 1, 3, 10, 20 or 60, and it's only for PROV or CCAA geographical granularity, map_scale = 60 by default and map_scale = NULL for high detailed map.
verbose	(boolean) show more information during the process
benchmark	(boolean) used to measure the performance of the system, benchmark = FALSE by default.

Examples

```
draw_serie("IPC251521")
draw_serie("IPC251541")
draw_serie("UA42121")
```

get_cache_rds	<i>Get rds content (cache)</i>
---------------	--------------------------------

Description

This function returns the content of a RDS file in cache

Usage

```
get_cache_rds(object, type = "SERIEOPERATION")
```

Arguments

object	(string) an object of the "type" option
type	(string) type of content do you want to read, type = "/POLYGONS-" by default

Examples

```

get_cache_rds("provincias", type = "POLYGONS")
get_cache_rds("comunidades_autonomas", type = "POLYGONS")
get_cache_rds("municipios", type = "POLYGONS")
get_cache_rds("natcodes", type = "DATATABLE")
get_cache_rds(4, type = "SERIEOPERATION")

```

```

get_data_metadataoperation
      Get data metadata-operation

```

Description

This function returns a data frame with latest n series data by crossing metadata from an id or code

Usage

```

get_data_metadataoperation(operation, query = NULL, p = 1, nult = 1,
  det = 0, tip = NULL, ioe = FALSE, lang = "ES")

```

Arguments

operation	operation identifier
query	string separated by AND with syntax variable = value using natural language
p	periodicity
nult	last n values
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = AM to obtain the metadata (crossing variables-values) of the series and a friendly output.
ioe	TRUE if code is in format I030138, and FALSE by default
lang	language used to obtain information

Examples

```

get_data_metadataoperation("IPC", query = "Provincias = Madrid AND Tipo de dato = Variacion mensual AND Grupos B

```

get_data_serie	<i>Get data serie</i>
----------------	-----------------------

Description

This function returns a data frame with data of a serie from an id or/and from a date or date range

Usage

```
get_data_serie(serie, date_start = NULL, date_end = NULL, nult = 0,  
               det = 0, lang = "ES")
```

Arguments

serie	serie identifier
date_start	start date in format (string) YYYY-MM-DD
date_end	end date in format (string) YYYY-MM-DD
nult	last n values
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Examples

```
get_data_serie("IPC206449", nult = 1)  
get_data_serie("IPC206449", nult = 5)  
get_data_serie("IPC206449", "2013-01-01", "2016-01-01")  
get_data_serie("IPC206449", "2010-01-01")
```

get_data_table	<i>Get data table</i>
----------------	-----------------------

Description

This function returns a data frame with latest n data of a table from an id or code

Usage

```
get_data_table(id, nult = 0, det = 0, tip = NULL, lang = "ES")
```

Arguments

id	table identifier
nult	last n values
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = AM to obtain the metadata (crossing variables-values) of the series and a friendly output.
lang	language used to obtain information

Examples

```
get_data_table(22350, 4)
```

get_frequency	<i>Get frequency</i>
---------------	----------------------

Description

This function return the periodicity (number) of a time serie

Usage

```
get_frequency(periodicity, data = NULL)
```

Arguments

periodicity	string with a periodicity
data	result of get_data_serie()\$Data call

Examples

```
get_frequency("Mensual")  
get_frequency("Trimestral")  
get_frequency("Anual")
```

get_geographical_variable	<i>Get geographical variable</i>
---------------------------	----------------------------------

Description

This function returns the geographical variable of a serie

Usage

```
get_geographical_variable(serie)
```

Arguments

serie	(string) serie id
-------	-------------------

Examples

```
get_geographical_variable("IPC251522")
```

get_natcode	<i>Get natcode</i>
-------------	--------------------

Description

This function allows get all natcodes or calculate a natcode from a serie and a geographical granularity

Usage

```
get_natcode(serie = NULL, all = TRUE, verbose = TRUE)
```

Arguments

serie	(string) serie identificator
all	(bool) if all = TRUE you will get all natcodes
verbose	(boolean) show more information during the process

Examples

```
get_natcode()  
get_natcode("IPC251522")  
get_natcode("IPC251541")  
get_natcode("DPOP37286")
```

get_operation	<i>Get operation</i>
---------------	----------------------

Description

This function returns a data frame with all available statistical operations from an id or code

Usage

```
get_operation(operation, ioe = FALSE, lang = "ES")
```

Arguments

operation	operation identificator
ioe	TRUE if code is in format IO30138, and FALSE by default
lang	language used to obtain information

Examples

```
get_operation(operation = 25)  
get_operation(operation = "IPC")  
get_operation(operation = 30138, ioe = TRUE)
```

get_operations_all	<i>Get operations (all)</i>
--------------------	-----------------------------

Description

This function returns a data frame with all available statistical operations

Usage

```
get_operations_all(lang = "ES")
```

Arguments

lang	language used to obtain information
------	-------------------------------------

Examples

```
get_operations_all()
```

get_operations_by_granularity	<i>Get operations by granularity</i>
-------------------------------	--------------------------------------

Description

This function returns a list of all operations that have a temporal or geographic granularity specified by user

Usage

```
get_operations_by_granularity(geographical_granularity = NULL,  
temporal_granularity = NULL, verbose = TRUE)
```

Arguments

geographical_granularity	(string) geographical granularity
temporal_granularity	(string) temporal granularity
verbose	(boolean) show more information during the process

Examples

```
get_operations_by_granularity(geographical_granularity = "PROV")  
get_operations_by_granularity(temporal_granularity = "Anual")  
get_operations_by_granularity(geographical_granularity = "PROV", temporal_granularity = "Mensual")
```

get_publications	<i>Get publications</i>
------------------	-------------------------

Description

This function returns a data frame with all available publications from an id or code

Usage

```
get_publications(det = 0, lang = "ES")
```

Arguments

det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Examples

```
get_publications()
```

get_publications_date	<i>Get publications date</i>
-----------------------	------------------------------

Description

This function returns a data frame with all publication date of a publication from an id or code

Usage

```
get_publications_date(code, det = 0, lang = "ES")
```

Arguments

code	publication identification
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Examples

```
get_publications_date(8)
```

```
get_publications_operation
```

Get publications operation

Description

This function returns a data frame with publications of an operation from an id or code

Usage

```
get_publications_operation(code, ioe = FALSE, det = 0, lang = "ES")
```

Arguments

code	operation identification
ioe	TRUE if code is in format I030138, and FALSE by default
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Details

Numeric code id Alphabetic code IPC IOE code (Inventario de Operaciones Estadísticas)

Examples

```
get_publications_operation(25)
get_publications_operation(30138, ioe = TRUE)
```

```
get_serie
```

Get serie

Description

This function returns a data frame with a serie from an id or code

Usage

```
get_serie(code, det = 0, tip = NA, lang = "ES")
```

Arguments

code	serie identification
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
lang	language used to obtain information

Examples

```
get_serie("IPC206449")
get_serie("IPC206449", det = 2, tip = "M")
```

```
get_series_by_common_parameters
```

Get series by common parameters

Description

This function returns a list of all series of an operation that have the same classification, name and geographical granularity of a specific serie

Usage

```
get_series_by_common_parameters(serie, classification = NULL,
                               verbose = TRUE)
```

Arguments

serie	(string) serie identification
classification	(string) serie classification, if classification = NULL this value will be auto-detected
verbose	(boolean) to show more information about this process, verbose = TRUE by default

Examples

```
get_series_by_common_parameters("IPC251539", classification = "Base 1992")
get_series_by_common_parameters("IPC251539")
get_series_by_common_parameters("DPOP37286")
get_series_by_common_parameters("UA42121")
```

```
get_series_by_granularity
```

Get series by granularity

Description

This function returns a list of all series of an operation that has a temporal or geographic granularity specified by the user

Usage

```
get_series_by_granularity(operation, geographical_granularity = NULL,
                          temporal_granularity = NULL, verbose = TRUE)
```

Arguments

operation	(string) operation identification
geographical_granularity	(string) geographical granularity
temporal_granularity	(string) temporal granularity
verbose	(boolean) show more information during the process

Examples

```
get_series_by_granularity("IPC", geographical_granularity = "PROV")
get_series_by_granularity("IPC", temporal_granularity = "Mensual")
get_series_by_granularity("IPC", geographical_granularity = "PROV", temporal_granularity = "Mensual")
```

```
get_series_metadataoperation
    Get series metadata operation
```

Description

This function returns a data frame with all series by metadata crossing from an id or code

Usage

```
get_series_metadataoperation(code, query = NULL, p = NULL, det = 0,
    tip = NA, ioe = FALSE, lang = "ES")
```

Arguments

code	operation identification
query	string separated by AND with syntax variable = value using natural language
p	periodicity, p = 1 by default
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
ioe	TRUE if code is in format IO30138, and FALSE by default
lang	language used to obtain information

Details

Numeric code id Alphabetic code IPC IOE code (Inventario de Operaciones Estadísticas) Código identificativo de la operación (IOE30138 /IPC/ 25) y códigos identificativos de las variables y valores: Provincias (FK_VARIABLE=115) = "Madrid" (FK_VALOR=29) > g1=115:29 Tipo de dato (FK_VARIABLE=3) = "Variación mensual" (FK_VALOR=84) > g2=3:84 Grupos ECOICOP (FK_VARIABLE=762) = "Todos los grupos ECOICOP" (FK_VALOR=null) > g3=762: Serie mensual (FK_PERIODICIDAD=1) > p=1 (Ver PUBLICACIONES_OPERACION)

Examples

```
get_series_metadataoperation("IPC", query = "Provincias = Madrid AND Tipo de dato = Variación mensual AND Grupo
```

get_series_operation *Get series operation*

Description

This function returns a data frame with all series of an operation from an id or code

Usage

```
get_series_operation(code, det = 0, tip = NA, pagination = FALSE,
  page = NA, page_start = NA, page_end = NA, ioe = FALSE,
  lang = "ES", cache = TRUE, benchmark = FALSE)
```

Arguments

code	operation identification
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
pagination	TRUE to obtain data page by page and FALSE by default.
page	page = 1 to obtain data of an specific page (to use this, pagination = FALSE).
page_start	page_start = 1 start page range to obtain data (to use this, pagination = TRUE).
page_end	page_end = 2 end page range to obtain data (to use this, pagination = TRUE).
ioe	TRUE if code is in format I030138, and FALSE by default
lang	language used to obtain information
cache	used to load data from local cache instead API, cache = FALSE by default.
benchmark	used to measure the performance of the system, benchmark = FALSE by default.

Details

Numeric code id Alphabetic code IPC IOE code (Inventario de Operaciones Estadísticas)

Examples

```
get_series_operation(25)
get_series_operation(25, 2, "M")
get_series_operation(30138, ioe = TRUE)
get_series_operation(30138, 2, "M", ioe = TRUE)
get_series_operation("IPC", det = 2, tip = "M")
get_series_operation(25, pagination = FALSE, page = 1, cache = FALSE)
get_series_operation(25, pagination = TRUE, page_start = 1, page_end = 2, cache = FALSE)
```

get_series_table	<i>Get series table</i>
------------------	-------------------------

Description

This function returns a data frame with all series of a table from an id or code

Usage

```
get_series_table(code, det = 0, tip = NA, lang = "ES")
```

Arguments

code	table identification
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
lang	language used to obtain information

Examples

```
get_series_table(22350)
get_series_table(22350, 2, "M")
```

get_series_values	<i>Get series values</i>
-------------------	--------------------------

Description

This function returns a data frame with the metadata that defines a series from an id or code

Usage

```
get_series_values(code, det = 0, lang = "ES")
```

Arguments

code	serie identification
det	det = 1 to see the detail of the variable to which it belongs, det = 0 by default
lang	language used to obtain information

Examples

```
get_series_values("IPC206449")
get_series_values("IPC206449", 1)
```

get_serie_nult	<i>Get serie last-n</i>
----------------	-------------------------

Description

This function returns the auto-calculated last-n series

Usage

```
get_serie_nult(serie)
```

Arguments

serie	(string) serie identificator
-------	------------------------------

Examples

```
get_serie_nult("IPC251541")
```

get_tables_group	<i>Get tables group</i>
------------------	-------------------------

Description

This function returns a data frame with a combination of variables and values that define a table from an id or code

Usage

```
get_tables_group(id, lang = "ES")
```

Arguments

id	table identification
lang	language used to obtain information

Examples

```
get_tables_group(22350)
```

get_tables_group_values

Get tables group values

Description

This function returns a data frame with a combination of variables and values that define a table from an id or code

Usage

```
get_tables_group_values(id, grp, det = 0, lang = "ES")
```

Arguments

id	table identification
grp	group identification
det	det = 1 to see the detail of the variable to which it belongs, det = 0 by default
lang	language used to obtain information

Examples

```
get_tables_group_values(22350, 81497)
get_tables_group_values(22350, 81497, 1)
```

get_tables_operation *Get tables operation*

Description

This function returns a data frame with all tables of an operation with geographic information from an id or code

Usage

```
get_tables_operation(code, det = 0, geo = 0, tip = NA, ioe = FALSE,
  lang = "ES")
```

Arguments

code	operation identification
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
geo	geo = 1 to access only tables with geographic content, geo = 0 by default
tip	tip = A to view as friendly, specifically the view the field ultima_modificacion
ioe	TRUE if code is in format IO30138, and FALSE by default
lang	language used to obtain information

Details

Numeric code id Alphabetic code IPC IOE code (Inventario de Operaciones Estadísticas)

Examples

```
get_tables_operation(25)
get_tables_operation(25, 2, 1, tip = "A")
get_tables_operation(30138, ioe = TRUE, 2, 1, tip = "A")
```

get_values_all	<i>Get values (all)</i>
----------------	-------------------------

Description

This function returns a data frame with all values from a variable

Usage

```
get_values_all(id, det = 0, lang = "ES")
```

Arguments

id	operation identification
det	det = 1 to see the detail of the variable to which it belongs, det = 0 by default
lang	language used to obtain information

Examples

```
get_values_all(115)
get_values_all(115, 1)
```

get_values_variableoperation	<i>Get values from variable operation</i>
------------------------------	-------------------------------------------

Description

This function returns a data frame with all values from a variable to an operation

Usage

```
get_values_variableoperation(id, op, det = 0, ioe = FALSE,
  lang = "ES")
```

Arguments

id	variable identification
op	operation identification
det	det = 1 to see the detail of the variable to which it belongs, det = 0 by default
ioe	TRUE if code is in format IO30138, and FALSE by default
lang	language used to obtain information

Details

Numeric code id Alphabetic code IPC IOE code (Inventario de Operaciones Estadísticas)

Examples

```
get_values_variableoperation(762, 25)
get_values_variableoperation(762, 25, 1)
get_values_variableoperation(762, 30138, ioe = TRUE)
get_values_variableoperation(762, 30138, ioe = TRUE, 1)
```

get_variables_all	<i>Get variables (all)</i>
-------------------	----------------------------

Description

This function returns a data frame with all system variables

Usage

```
get_variables_all(lang = "ES")
```

Arguments

lang	language used to obtain information
------	-------------------------------------

Examples

```
get_variables_all()
```

get_variables_operation	<i>Get variable operation</i>
-------------------------	-------------------------------

Description

This function returns a data frame with system variables of an operation from an id or code

Usage

```
get_variables_operation(operation, ioe = FALSE, lang = "ES")
```

Arguments

operation	operation identifier
ioe	TRUE if code is in format I030138, and FALSE by default
lang	language used to obtain information

Examples

```
get_variables_operation(operation = 25)
get_variables_operation(operation = "IPC")
get_variables_operation(operation = 30138, ioe = TRUE)
```

```
get_var_values_operation
```

Get variable values operation

Description

This function returns a data frame with all values and variables of an operation from an id or code

Usage

```
get_var_values_operation(operation, ioe = FALSE, lang = "ES")
```

Arguments

operation	operation identifier
ioe	TRUE if code is in format I030138, and FALSE by default
lang	language used to obtain information

Examples

```
get_var_values_operation(operation = 25)
get_var_values_operation(operation = "IPC")
get_var_values_operation(operation = 30138, ioe = TRUE)
```

```
highcharts_series
```

Highcharts series

Description

This function draws a highchart with data of a series from an id and/or from a date or date range

Usage

```
highcharts_series(code, date_start = NA, date_end = NA, nult = 0,
  det = 0, lang = "ES")
```

Arguments

code	identification code of a serie (e.g. "IPC206449")
date_start	start date in format (string) YYYY-MM-DD
date_end	end date in format (string) YYYY-MM-DD
nult	last n values
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Examples

```
highcharts_series("IPC206449", nult = 1) # Get the latest data of a series
highcharts_series("IPC206449", nult = 5) # Get the \code{n} last data of a series
highcharts_series("IPC206449", "2013-01-01", "2016-01-01") # Get data of a series between two dates
highcharts_series("IPC206449", "2010-01-01") # Get data from a series from a date
```

plot_series	<i>Plot series</i>
-------------	--------------------

Description

This function draws a plot with data of a series from an id and/or from a date or date range

Usage

```
plot_series(code, date_start = NA, date_end = NA, nult = 0,
            det = 0, type = NA, lang = "ES")
```

Arguments

code	identification code of a serie (e.g. "IPC206449")
date_start	start date in format (string) YYYY-MM-DD
date_end	end date in format (string) YYYY-MM-DD
nult	last n values
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
type	what type of plot should be drawn, type = "p" (for points) by default. See type in plot
lang	language used to obtain information

Examples

```
plot_series("IPC206449", nult = 1) # Get the latest data of a series
plot_series("IPC206449", nult = 5, type = "l") # Get the \code{n} last data of a series
plot_series("IPC206449", "2013-01-01", "2016-01-01") # Get data of a series between two dates
plot_series("IPC206449", "2010-01-01") # Get data from a series from a date
```

update_cache	<i>Update cache</i>
--------------	---------------------

Description

This function allow update specific or all cache data

Usage

```
update_cache(code = 0, n = 0, page = NA, pagination = TRUE,
             page_start = NA, page_end = NA, benchmark = TRUE, force = FALSE,
             ignore_series = NULL, tip = "M", det = 2)
```

Arguments

code	operation identificator
n	number of operation to update starting from first operation getted from get_operations_all() function.
page	page = 1 to obtain data of an specific page (to use this, pagination = FALSE).
pagination	TRUE to obtain data page by page and FALSE by default.
page_start	page_start = 1 start page range to obtain data (to use this, pagination = TRUE).
page_end	page_end = 2 end page range to obtain data (to use this, pagination = TRUE).
benchmark	used to measure the performance of the system, benchmark = FALSE by default.
force	(boolean) to force to update all cache data, force = FALSE by default.
ignore_series	(int) list of operation identificators to ignore. More slow series to cache are: 16, 49, 330 and 334
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default

Examples

```
update_cache(code = 249)
update_cache(code = 249, page = 1)
update_cache(n = 3)
```

update_series	<i>Update series</i>
---------------	----------------------

Description

This function allow update specific or all cache data

Usage

```
update_series(serie = NULL, benchmark = TRUE, page = 1, tip = "M",
  det = 2, lang = "ES")
```

Arguments

serie	serie identificator
benchmark	used to measure the performance of the system, benchmark = FALSE by default.
page	page = 1 to obtain data of an specific page.
tip	tip = M to obtain the metadata (crossing variables-values) of the series.
det	det = 2 to see two levels of depth, specifically to access the PubFechaAct object, det = 0 by default
lang	language used to obtain information

Examples

```
update_series()
```

Index

`convert_natcode_to_geocode`, [2](#)

`draw_serie`, [3](#)

`get_cache_rds`, [3](#)

`get_data_metadataoperation`, [4](#)

`get_data_serie`, [5](#)

`get_data_table`, [5](#)

`get_frequency`, [6](#)

`get_geographical_variable`, [6](#)

`get_natcode`, [7](#)

`get_operation`, [7](#)

`get_operations_all`, [8](#)

`get_operations_by_granularity`, [8](#)

`get_publications`, [9](#)

`get_publications_date`, [9](#)

`get_publications_operation`, [10](#)

`get_serie`, [10](#)

`get_serie_nult`, [15](#)

`get_series_by_common_parameters`, [11](#)

`get_series_by_granularity`, [11](#)

`get_series_metadataoperation`, [12](#)

`get_series_operation`, [13](#)

`get_series_table`, [14](#)

`get_series_values`, [14](#)

`get_tables_group`, [15](#)

`get_tables_group_values`, [16](#)

`get_tables_operation`, [16](#)

`get_values_all`, [17](#)

`get_values_variableoperation`, [17](#)

`get_var_values_operation`, [19](#)

`get_variables_all`, [18](#)

`get_variables_operation`, [18](#)

`highcharts_serie`, [19](#)

`plot`, [20](#)

`plot_serie`, [20](#)

`update_cache`, [20](#)

`update_series`, [21](#)