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Description Focuses on data collecting, analyzing and visualization in green finance and environmental risk research and analysis. Main function includes environmental data collecting from official websites such as MEP (Ministry of Environmental Protection of China, <https://www.mee.gov.cn>), water related projects identification and environmental data visualization.

Encoding UTF-8

License GPL-2

LazyData true

Imports rvest, xml2, jsonlite, httr, stringi, V8, data.table, tidyr, scatterpie, ggplot2, ggrepel, circlize, googlesheets4, gsheet

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BugReports https://github.com/bnycx/gfer/issues

Suggests knitr, rmarkdown

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Contents

checkHttpStatus . . . 3
cm . . . 3
dataJson2df . . . 4
GDPmix . . . 4
genDfwds . . . 5
getCSRRating . . . 5
getCSRRating_unit . . . 6
getENNames . . . 7
getENNames_unit . . . 8
getExchange . . . 8
getHisMktCap . . . 9
getHisMktCap_unit . . . 10
getIndex . . . 11
getIndexConstnt . . . 12
getIndexData . . . 12
getNBS . . . 13
getPPPList . . . 13
getPPPList_unit . . . 14
getProxy . . . 15
getStockList . . . 15
getTickers . . . 16
getTickers_unit . . . 16
getWaternomicsData_goog . . . 17
getWaternomicsData_NBS . . . 17
getWaterQ_MEP_all . . . 18
getWaterQ_MEP_all_unit . . . 19
is.listed . . . 19
milSec . . . 20
plotChord . . . 20
plotScatterPie . . . 21
statscnDbs . . . 22
statscnQueryData . . . 23
statscnQueryLastN . . . 24
statscnQueryZb . . . 25
statscnRegions . . . 26
statscnRowNamePrefix . . . 26

Index **28**

checkHttpStatus *private function for check the http status*

Description

private function for check the http status

Usage

```
checkHttpStatus(ret)
```

Arguments

ret	the response obj returned by httr package

Value

return nothing , but if it finds some error , it stop the script

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

cm *Matrix showing complicated management of China's Water Resource*

Description

Matrix showing complicated management of China's Water Resource

Usage

```
cm
```

Format

A data frame with 13 rows and 11 variables:

...

dataJson2df *private function to convert the returned jason data to a dataframe*

Description

private function to convert the returned jason data to a dataframe

Usage

```
dataJson2df(rawObj, rowcode, colcode)
```

Arguments

rawObj	the fromJSON output
rowcode	rowcode in the data frame
colcode	colcode in the data frame

Value

the contructed data frame

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

GDPmix *Table about GDP mix of China provinces in 2015*

Description

Table about GDP mix of China provinces in 2015

Usage

```
GDPmix
```

Format

A data frame with 11 rows and 7 variables:

...

genDfwds *private function for constructing the query parameter for dfwds*

Description

private function for constructing the query parameter for dfwds

Usage

```
genDfwds(wdcode, valuecode)
```

Arguments

wdcode	string value , one of c("zb","sj","reg")
valuecode	string value , following is the table for available valuecode zb: the valudecode can be gotten by statscnQueryZb() function sj: the valudecode can be "2014" for nd db, "2014C" for jd db. reg: the valudecode is the region code fetched by statscnRegions(dbcode) function

Value

return the queyr string for the http request

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

getCSRRating *get CSR rating from a website*

Description

get CSR rating from a website

Usage

```
getCSRRating(startPage, endPage, year = 2015, proxy = FALSE)
```

Arguments

startPage	on Which page you want to start, default is 1
endPage	On which page you want to stop scrapping
year	In which year you want the rank
proxy	whether use the proxy, default is FALSE

Details

Get CSR ratings and reports of different companies from http://stockdata.stock.hexun.com/zrbg/

Value

A table of CSR ratings collected from your input page

References

www.hexun.com

Examples

```
## Not run:
# get first two pages of CSR ratings in 2015
getCSRRating(1,3)

## End(Not run)
```

`getCSRRating_unit` *get CSR rating from a website for a unit page*

Description

get CSR rating from a website for a unit page

Usage

```
getCSRRating_unit(page, date, proxy = NULL)
```

Arguments

`page`	on Which page you want to scrap
`date`	represents the date is until which date, usually it's the last day of a year e.g., "2015-12-31" for the date of year 2015, "2014-12-31" for the date of year 2014
`proxy`	whether use the proxy, default is FALSE

Details

Get CSR ratings and reports of different companies from http://stockdata.stock.hexun.com/zrbg/

Value

A table of CSR ratings collected from your input page

References

www.hexun.com

getENNames *get a company's EN names*

Description

get a company's EN names

Usage

```
getENNames(tickers)
```

Arguments

tickers	ticker/sympol of a company, TICKERS MUST BE CHARACTERs, '006027' INSTEAD OF '6027'

Details

Data comes from hexun.com

Value

A data table with companies' EN names

References

http://hexun.com

Examples

```
## Not run:
getENNames(601857)

## End(Not run)
```

getENNames_unit *get a company's English name*

Description

get a company's English name

Usage

```
getENNames_unit(ticker)
```

Arguments

ticker	ticker/sympol of a company, MUST BE A CHARACTER, '006027' INSTEAD OF '6027'

Details

Data comes from hexun.com

Value

A data table with companies' EN names

References

http://hexun.com

getExchange *get a company's listed location*

Description

get a company's listed location

Usage

```
getExchange(tickers)
```

Arguments

tickers	ticker/sympol of a company, TICKERS MUST BE CHARACTERs, '006027' INSTEAD OF '6027'

Details

Data comes from www.finance.sina.com.cn

Value

A data table with a listed companies' ticker, security name and listed exchange location

References

www.finance.sina.com.cn

Examples

```
## Not run:
getExchange('600601')
getExchange(c('00005', '00001'))

## End(Not run)
```

`getHisMktCap` *get a company's historical market cap, data comes from NetEase*

Description

get a company's historical market cap, data comes from NetEase

Usage

```
getHisMktCap(tickers, date1, date2)
```

Arguments

`tickers`	ticker/sympol of a company, TICKERS MUST BE CHARACTERs, '006027' INSTEAD OF '6027'
`date1`	starting date, in the following format "20160101", means Jan 1st of 2016
`date2`	ending date, in the following format "20160101", if you only want one day's data, just set starting date and ending date the same day

Details

The input date interval should have at least one work day Data comes from www.money.163.com

Value

A data table with companies total capitalization and market capitalization

References

www.money.163.com

Examples

```
## Not run:
getHisMktCap(601857, '20161202', '20161203')

## End(Not run)
```

`getHisMktCap_unit` *get a company's historical market cap, data comes from NetEase*

Description

get a company's historical market cap, data comes from NetEase

Usage

```
getHisMktCap_unit(ticker, date1, date2)
```

Arguments

`ticker`	ticker/sympol of a company, MUST BE A CHARACTER, '006027' INSTEAD OF '6027'
`date1`	starting date, in the following format "20160101", means Jan 1st of 2016
`date2`	ending date, in the following format "20160101", if you only want one day's data, just set starting date and ending date the same day

Details

Data comes from www.money.163.com

Value

A data table with companies total capitalization and market capitalization

References

www.money.163.com

getIndex *get a company's market cap, data comes from NetEase*

Description

get a company's market cap, data comes from NetEase

Usage

```
getIndex(tickers, indexData)
```

Arguments

tickers	ticker/sympol of a company, MUST BE A CHARACTER, e.g., input "006600" instead of 006600 The tickers have to be FULL AND EXACT, e.g., for Shanghai exchange and Shenzhen exchange, the input must have 6 digits, and for HK exchange, it must have 5 digits. the '0' in the beginning cannot be left out.
indexData	the index information, before running getIndex, indexData needs to be loaded using getIndexData

Details

Data comes from www.finance.sina.com.cn and www.etnet.com.hk

Value

A data table with companies and which index they are included

References

www.finance.sina.com.cn www.etnet.com.hk

Examples

```
## Not run:
indexData <- getIndexData()
getIndex(600601, indexData)

## End(Not run)
```

`getIndexConstnt` *get a company's market cap, data comes from NetEase*

Description

get a company's market cap, data comes from NetEase

Usage

```
getIndexConstnt(indexPool)
```

Arguments

`indexPool`	a pool of different index, special format for gfer

Value

A data table with companies total capitalization and market capitalization

`getIndexData` *get index information Currently include CSI 100, SSE 50, CSI 300, SSE Central SOEs 50, HSI, HSCEI*

Description

get index information Currently include CSI 100, SSE 50, CSI 300, SSE Central SOEs 50, HSI, HSCEI

Usage

```
getIndexData()
```

Value

a data table containing index information

getNBS *getNBS*

Description

get National Bureau of Statistics data

Usage

```
getNBS(indicator, start, end)
```

Arguments

indicator	of which data is fetched, indicator includes 'GDP', 'water resources', 'water use' and 'wastewater', etc.
start	starting year of data wanted
end	end year of data wanted, make sure your input end year exists in the NBS website

Value

no return

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

getPPPList *get PPP list from an official website*

Description

get PPP list from an official website

Usage

```
getPPPList(startPage = 1, endPage, proxy = FALSE)
```

Arguments

startPage	on Which page you want to start, default is 1
endPage	On which page you want to stop scrapping
proxy	whether proxy will be used, default is FALSE

Details

Get PPP list from the Ministry of Finance of China (http://www.cpppc.org:8082/efmisweb/ppp/projectLibrary/toPPPList.do?p
to view the listed projects in the PPP library.

Value

A table of PPP projects collected from your input page

References

www.cpppc.org

Examples

```
## Not run:
#scrape the first two pages
getPPPList(1,3)

## End(Not run)
```

`getPPPList_unit` *get PPP list from a single page*

Description

get PPP list from a single page

Usage

```
getPPPList_unit(page, proxy = NULL)
```

Arguments

`page`	The page number
`proxy`	if you wnat to use a proxy to avoid blocking, you can input a proxy, otherwise leave it blank.

Value

A table of PPP projects collected from your input page

`getProxy` *Get proxy pool from free proxy provider*

Description

Get proxy pool from free proxy provider

Usage

```
getProxy()
```

Details

Extract proxies from http://www.free-proxy-list.net/, in case of the risk of being blocked by the scrapped website

Value

The sum of `x` and `y`.

References

www.free-proxy-list.net

`getStockList` *Get information from Shanghai Exchange and Shenzhen Exchange. This will only get stock information in Shanghai Exchange and Shenzhen Exchange Including stocker ticker, stock name and company full name. Data comes from China Merchants Bank*

Description

Get information from Shanghai Exchange and Shenzhen Exchange. This will only get stock information in Shanghai Exchange and Shenzhen Exchange Including stocker ticker, stock name and company full name. Data comes from China Merchants Bank

Usage

```
getStockList()
```

References

http://info.cmbchina.com/Stock/Single/

`getTickers` *get ticker by input a company's full name or a list of companies' full name*

Description

It can also be a way to test if a company is listed NOTE: If a company is listed in multiple exchange, then it needs double check, the programe only chooses ticker from random exchange

Usage

```
getTickers(corpNames)
```

Arguments

`corpNames`	Full name of a company, should be full name

Details

Data comes from www.cninfo.com.cn/

Value

A data table with companies stock name and stock ticker

References

www.cninfo.com.cn

`getTickers_unit` *get ticker by input a company's full name*

Description

It can also be a way to test if a company is listed

Usage

```
getTickers_unit(corpName)
```

Arguments

`corpName`	Full name of a company

Details

Data comes from www.cninfo.com.cn/

Value

A data table with companies stock name and stock ticker

`getWaternomicsData_goog` *getWaternomicsData_goog*

Description

Get NBS data from google sheet by shared link. Default link is provided by gfer, you can also create your own google sheet of GDP. NOTE: The 'link sharing on' of the sheet must be ticked in order to read

Usage

```
getWaternomicsData_goog()
```

`getWaternomicsData_NBS` *getWaternomicsData_NBS*

Description

Get NBS data from NBS website.

Usage

```
getWaternomicsData_NBS(start, end)
```

Arguments

`start`	starting year of data wanted
`end`	end year of data wanted, make sure your input end year exists in the NBS website

getWaterQ_MEP_all *get PPP list from a single page*

Description

get PPP list from a single page

Usage

```
getWaterQ_MEP_all(year, week, station1, station2, proxy = FALSE)
```

Arguments

year	In which year you would like to scrape
week	In which week you would like to scrape, can be an array, like 3:5
station1	the start station index on the page
station2	the end station index on the page
proxy	Whether to use proxy, default is FALSE

Details

Get monitoring data of different stations from Minitsry of Environmental Protection of China (http://datacenter.mep.gov.cn/report/getCountGraph.do?type=runQianWater). Using this function you will get data of all the stations. Since the number of stations vary with time, using this function, you have to make sure that within the period you are scrapping, the number of stations keep consistant.

References

http://datacenter.mee.gov.cn/report/getCountGraph.do?type=runQianWater

Examples

```
## Not run:
# get data from 1st station to 5th station of the 3rd week of 2016
a <- getWaterQ_MEP_all(2016, 3, 1, 5)


## End(Not run)
```

getWaterQ_MEP_all_unit *get PPP list from a single page*

Description

get PPP list from a single page

Usage

```
getWaterQ_MEP_all_unit(year, week, station1, station2, proxy = NULL)
```

Arguments

year	In which year you would like to scrape
week	In which week you would like to scrape
station1	the start station index on the page
station2	the end station index on the page
proxy	if you wnat to use a proxy to avoid blocking, you can input a proxy, otherwise leave it blank.

Value

A table of PPP projects collected from your input page

References

http://datacenter.mee.gov.cn/report/getCountGraph.do?type=runQianWater

---

is.listed *Check if a company is listed in Chinese stock market*

Description

Check if a company is listed in Chinese stock market

Usage

```
is.listed(corpList, stockList)
```

Arguments

corpList	company list you want to check if listed, should be a dataframe
stockList	Result from getStockList

References

http://info.cmbchina.com/Stock/Single/

`milSec` *private function for sec*

Description

private function for sec

Usage

```
milSec()
```

Value

milsec

`plotChord` *plotScatterPie*

Description

if 'Summation of cell padding on y-direction are larger than the height of the cells' appears, just enlarge the xlim or ylim accordingly

Usage

```
plotChord(
  data,
  t = FALSE,
  ifsep = TRUE,
  trans = 0.3,
  highlight = NULL,
  xlim = c(-1, 1),
  ylim = c(-1, 1)
)
```

Arguments

data	a dataframe showing different management intersections. See the data frame in the example
t	is transpose the dataframe, by default, lines flow from row to column, if t == TRUE, lines will flow from columns to rows. Once transposed,
ifsep	if separate row and col categories in the chart, default is TRUE
trans	transparency of the chart's lines, default is 0.3
highlight	a string or string array of highlighted items, MUST be selected from first column (which represents names) or colnames. if highlight has more than 2 items, they should belong to same category, either colnames, or names. One name and one column name is not allowed.
xlim	x limit of the chart, default is c(-1, 1)
ylim	y limte of the chart, default is c(-1, 1)

Details

plot scatter pie chart for multidimension analysis, such as waternomics. This plot can provide information about water use/wastewater of each provinces and GDP mix of each provinces, see examples.

Examples

```
## Not run:
plotChord(cm)
plotChord(cm, t = T)
plotChord(cm, highlight = 'MEP')
plotChord(cm, highlight = 'Investment')

## End(Not run)
```

---

plotScatterPie *plotScatterPie*

Description

plot scatter pie chart for multidimension analysis, such as waternomics. This plot can provide information about water use/wastewater of each provinces and GDP mix of each provinces, see examples.

Usage

```
plotScatterPie(
  data,
  pieRange,
  pieColor = NULL,
  xmeanLine = TRUE,
  ymeanLine = TRUE,
  label_on = TRUE,
  output = FALSE
)
```

Arguments

data	a dataframe with colnames x, y, r, label, these four names must be in colnames.
pieRange	define which column to which column to be presented by pie chart, see examples
pieColor	color for different colors in pie chart
xmeanLine	if plot x mean line
ymeanLine	if plot y mean line
label_on	Whether to show label
output	if you want an ggplot object as output, default is FALSE

Examples

```
GDPColor_CWR <- c("#6B8033", "#020303", "#0D77B9")


data(GDPmix)

# in colnames(GDPmix), there must be x, y, r, label.
# but right now, GDPmix has x, y, r, but lacks a label column, let's assign label to province column
colnames(GDPmix)[1] <- 'label'

## Not run:
plotScatterPie(GDPmix, pieRange = 4:6, pieColor = GDPColor_CWR)

## End(Not run)
```

---

statscnDbs *the available dbs*

Description

the available dbs in the national db

Usage

```
statscnDbs()
```

Value

a data frame with 2 columns , one is the dbcode, another is the db description

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Examples

```
 ## Not run:
 statscnDbs()

## End(Not run)
```

---

statscnQueryData *query data in the statscn db*

Description

the main function for querying the statscn database, it will retrieve the data from specified db and orginize the data in a data frame.

Usage

```
statscnQueryData(
  zb = "A0201",
  dbcode = "hgnd",
  rowcode = "zb",
  colcode = "sj",
  moreWd = list(name = NA, value = NA)
)
```

Arguments

zb	the zb/category code to be queried
dbcode	the db code for querying
rowcode	rowcode in the returned data frame
colcode	colcode in the returned data frame
moreWd	more constraint on the data where the name should be one of c("reg","sj") , which stand for region and sj/time. the valuecode for reg should be the region code queried by statscnRegions() the valuecode for sj should be like '2014' for *nd , '2014C' for *jd , '201405' for *yd. Be noted that , the moreWd name should be different with either rowcode or colcode

Value

the data frame you are quering

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Examples

```
## Not run:
df <- statscnQueryData('A0201', dbcode = 'hgnd')
df <- statscnQueryData('A0201',dbcode = 'fsnd', rowcode = 'zb', colcode = 'sj',
                    moreWd = list(name = 'reg', value = '110000'))

## End(Not run)
```

`statscnQueryLastN` *fetch the lastN data*

Description

fetch the lastN data for the latest query, only affect the number of rows in the returned data. This function can not be used alone , statscnQueryData() has to be called before this function

Usage

```
statscnQueryLastN(n)
```

Arguments

`n`	the number of rows to be fetched

Value

the last n rows data in the latest query

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Examples

```
## Not run:
df=statscnQueryData('A0201',dbcode='hgnd')
df2=statscnQueryLastN(20)

## End(Not run)
```

---

statscnQueryZb *the data categories*

Description

the sub data categories for the zbid category, dbcode need to be specified, where the dbcode can be fetched by function statscnDbs(). In the returned data frame, the column 'isParent' shows if each sub category is leap category or not

Usage

```
statscnQueryZb(zbid = "zb", dbcode = "hgnd")
```

Arguments

zbid	the father zb/category id , the root id is 'zb'
dbcode	which db will be queried

Value

the data frame with the sub zbs/categories , if the given zbid is not a Parent zb/category, null list is returned

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Examples

```
## Not run:
statscnQueryZb()
statscnQueryZb('A01',dbcode="hgnd")

## End(Not run)
```

statscnRegions *the regions in db*

Description

the available regions in the specified db, it is used for query the province, city and country code generally

Usage

```
statscnRegions(dbcode = "fsnd")
```

Arguments

dbcode	the dbcode should be some province db(fs*) , city db(cs*) or internaltional db(gj*)

Value

the data frame with all the available region codes and names in the db

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Examples

```
## Not run:
statscnRegions('fsnd')
statscnRegions('csnd')
statscnRegions('gjnd')

## End(Not run)
```

statscnRowNamePrefix *statscnRowNamePrefix*

Description

set the rowName prefix in the dataframe

Usage

```
statscnRowNamePrefix(p = "nrow")
```

Arguments

p	, how to set the rowname prefix. it is 'nrow' by default , and it is the only supported value currently to unset the row name prefix, call this function with p=NULL

Details

in case you encounter the following error: Error in 'row.names<-.data.frame'('*tmp*', value = value) : duplicate 'row.names' are not allowed you need to call this function

Value

no return

References

Xuehui YANG (2016). rstatscn: R Interface for China National Data. R package version 1.1.1. https://CRAN.R-project.org/package=rstatscn

Index

∗ **datasets**
  cm, 3
  GDPmix, 4

checkHttpStatus, 3
cm, 3

dataJson2df, 4

GDPmix, 4
genDfwds, 5
getCSRRating, 5
getCSRRating_unit, 6
getENNames, 7
getENNames_unit, 8
getExchange, 8
getHisMktCap, 9
getHisMktCap_unit, 10
getIndex, 11
getIndexConstnt, 12
getIndexData, *11*, 12
getNBS, 13
getPPPList, 13
getPPPList_unit, 14
getProxy, 15
getStockList, 15, *19*
getTickers, 16
getTickers_unit, 16
getWaternomicsData_goog, 17
getWaternomicsData_NBS, 17
getWaterQ_MEP_all, 18
getWaterQ_MEP_all_unit, 19

is.listed, 19

milSec, 20

plotChord, 20
plotScatterPie, 21

statscnDbs, 22
statscnQueryData, 23
statscnQueryLastN, 24
statscnQueryZb, 25
statscnRegions, 26
statscnRowNamePrefix, 26