## Package 'schwabr'

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## BugReports https://github.com/altanalytics/schwabr/issues

#### Description

Use R to interface with the 'Charles Schwab Trade API' <https://developer.schwab.com/>. Functions include authentication, trading, price requests, account information, and option chains. A user will need a Schwab brokerage account and Schwab Individual Developer app. See README for authentication process and examples.

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Encoding UTF-8

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schwab\_accountData Get account balances, positions, and account numbers returned as a list

## Description

Retrieves account data for all accounts linked to the Access Token or a specific account

## Usage

```
schwab_accountData(
  output = "df",
  account_number = "",
  value_pull = c("all", "bal", "pos", "acts"),
  accessTokenList = NULL
)
```

#### Arguments

output	Use 'df' for a list of 3 data frames containing balances, positions, and orders.
	Otherwise the data will be returned as a list of lists
account_number	The account number as shown on the Schwab website
value_pull	Can be one of 'all', 'bal', 'pos', 'acts' depending on what you want to pull back
accessTokenList	
	A valid Access Token must be set using the output from schwab_auth3_accessToken.
	The most recent Access Token will be used by default unless one is manually
	passed into the function.

## Details

The output will be either a list of three data frames or a list of three lists that contain balances, positions, and account numbers for Schwab accounts linked to the access token or specified. For historical orders, see schwab\_orderSearch. The default is for a data frame output which is much cleaner.

schwab\_act\_hash

#### Value

a list of requested account details

## Examples

```
## Not run:
# Get stored refresh token
refreshToken = readRDS('/secure/location/')
# Generate a new access token
accessTokenList = schwab_auth3_accessToken(appKey, appSecret, refreshToken)
# Passing the accessTokenList is optional. The default will return balances
asDF = schwab_accountData()
asList = schwab_accountData('list',account_number = '', accessTokenList)
```

## End(Not run)

schwab\_act\_hash Get account hashed value

## Description

Retrieves the Hashed account value for a specific account

## Usage

```
schwab_act_hash(account_number = "", accessTokenList = NULL)
```

## Arguments

account\_number A Standard Schwab Account number

accessTokenList

A valid Access Token must be set using schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Value

A hashed account number

#### Examples

## Not run:

```
# Get stored refresh token
refreshToken = readRDS('/secure/location/')
# Generate a new access token
accessTokenList = schwab_auth3_accessToken(appKey, appSecret, refreshToken)
```

```
# Passing the accessTokenList is optional. The default will return balances
act_hash = schwab_act_hash(account_number = '123456789')
```

## End(Not run)

schwab\_auth1\_loginURL Auth Step 1: Generate LogIn URL

#### Description

Create URL to grant App access to Charles Schwab accounts

#### Usage

schwab\_auth1\_loginURL(appKey, callbackURL)

#### Arguments

аррКеу	'Schwab API' generated App Key for the registered app.
callbackURL	Users Callback URL for the registered app

## Details

To use the 'Schwab API', both an account and a registered developer app are required. The developer app functions as a middle layer between the brokerage account and the API. A developer app should be registered on the Schwab Developer site. Once logged in to the developer site, use My Apps to register an application. An App will have a key and secret provided. The Key/Secret is auto generated and can be found under Dashboard > View Details at the bottom. The user must also create a Callback URL. The Callback URL must be a valid URL. The example below assumes the Callback URL is https://127.0.0.1. The Application should be in a "Ready to Use" state before attempting to login.

This function will use these inputs to generate a URL where the user can log in to their standard Charles Schwab Access Page and grant the application access to the specific accounts, enabling the API. The URL Authorization Code generated at the end of the log in process will feed into schwab\_auth2\_refreshToken. For questions, please reference the Schwab Docs or see the examples in the 'schwabr' readme.

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#### Value

login url to grant app permission to Schwab accounts

#### Examples

```
# Visit the URL generated from the function below to log in accept terms and
# select the accounts you want to have API permissions.
```

```
# This assumes you set the callback to 'https://127.0.0.1'
appKey = 'ALPHANUM1234KEY'
loginURL = schwab_auth1_loginURL(appKey, 'https://127.0.0.1')
```

schwab\_auth2\_refreshToken

Auth Step 2: Obtain Refresh Token

## Description

Get a Refresh Token using the Authorization Code

#### Usage

```
schwab_auth2_refreshToken(appKey, appSecret, callbackURL, codeToken)
```

#### Arguments

аррКеу	'Schwab API' generated App Key for the registered app.
appSecret	'Schwab API' generated Secret for the registered app.
callbackURL	Users Callback URL for the registered app
codeToken	Will be the URL at the end of Auth Step 1. Somewhere in the URL you should see code=CO.xxx. Paste the entire URL into the function.

#### Details

Once a URL has been generated using schwab\_auth1\_loginURL, a user can visit that URL to grant access to Schwab accounts. Once the button "Done" at the end of the process is pressed, the user will be redirected, potentially to "This site can't be reached". This indicates a successful log in. The URL of this page contains the Authorization Code. Paste the entire URL, not just the Authorization Code, into schwab\_auth2\_refreshToken. The authorization code will be a long alpha numeric string starting with 'https' and having 'code=' embedded.

The output of schwab\_auth2\_refreshToken will be a Refresh Token which will be used to gain access to the Schwab account(s) going forward. The Refresh Token will be valid for 7 days. Be sure to save the Refresh Token to a safe location.

The Refresh Token is needed to generate an Access Token using schwab\_auth3\_accessToken, which is used for general account access. The Access Token expires after 30 minutes but the

Refresh Token remains active for 7 days. You want to store your refresh token somewhere safe so that you can reference it later to regenerate an authorization token. After 7 days you have to manually log in again. The 'Schwab API' team indicated this might change in the future, but no set timeline.

## Value

Refresh Token that is valid for 7 days

## See Also

schwab\_auth1\_loginURL to generate a login url which leads to an authorization code, and more importantly generated a Refresh Token, you can feed the refresh token into schwab\_auth3\_accessToken to generate a new Access Token

## Examples

## Not run:

# Save the Refresh Token somewhere safe where it can be retrieved saveRDS(tok\$refresh\_token,'/secure/location/')

## End(Not run)

schwab\_auth3\_accessToken

Auth Step 3: Get Access Token

#### Description

Get a new Access Token using a valid Refresh Token

## Usage

schwab\_auth3\_accessToken(appKey, appSecret, refreshToken)

аррКеу	'Schwab API' generated App Key for the registered app.
appSecret	'Schwab API' generated Secret for the registered app.
refreshToken	An existing Refresh Token generated using schwab_auth2_refreshToken. Only pass the refresh_token, not the entire list

#### Details

An Access Token is required for the functions within 'schwabr' It serves as a user login to your accounts. The token is valid for 30 minutes and allows the user to place trades, get account information, get order history, pull historical stock prices, etc. A Refresh Token is required to generate an Access Token. schwab\_auth2\_refreshToken can be used to generate a Refresh Token which stays valid for 7 days. The appKey is generated automatically when an App is registered on the Schwab Developer site. By default, the Access Token is stored into options and will automatically be passed to downstream functions. However, the user can also submit an Access Token manually if multiple tokens are in use (for example: when managing more than one log in.)

DISCLOSURE: This software is in no way affiliated, endorsed, or approved by Charles Schwab or any of its affiliates. It comes with absolutely no warranty and should not be used in actual trading unless the user can read and understand the source code. The functions within this package have been tested under basic scenarios. There may be bugs or issues that could prevent a user from executing trades or canceling trades. It is also possible trades could be submitted in error. The user will use this package at their own risk.

#### Value

Access Token that is valid for 30 minutes. By default it is stored in options. This is a list of objects that also shows when the access token expires

#### See Also

schwab\_auth1\_loginURL to generate a login url which leads to an authorization code, then use schwab\_auth2\_refreshToken to generate Refresh Token with the authorization code

#### Examples

## Not run:

```
# A valid Refresh Token can be fed into the function below for a new Access Token
refreshToken = readRDS('/secure/location/')
accessTokenList = schwab_auth3_refreshToken('schwab_APPKey', 'schwab_AppSecret', refreshToken)
```

## End(Not run)

schwab\_cancelOrder Cancel an Open Order

#### Description

Pass an Order ID and Account number to cancel an existing open order

## Usage

```
schwab_cancelOrder(orderId, account_number, accessTokenList = NULL)
```

#### Arguments

orderId A valid Schwab Order ID account\_number A Schwab account number associated with the Access Token accessTokenList A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Value

order API URL. Message confirming cancellation

## Examples

## Not run:

schwab\_cancelOrder(orderId = 123456789, account\_number = 987654321)

## End(Not run)

schwab\_marketHours Get Market Hours

#### Description

Returns a list output for current day and specified market that details the trading window

## Usage

```
schwab_marketHours(
   marketType = c("EQUITY", "OPTION", "BOND", "FUTURE", "FOREX"),
   date = Sys.Date(),
   accessTokenList = NULL
)
```

marketType	The asset class to pull: 'EQUITY','OPTION','BOND','FUTURE','FOREX'. Default is EQUITY
date	Current or future date to check hours
accessTokenLis	t
	A valid Access Token must be set using the output from schwab_auth3_accessToken.
	The most recent Access Token will be used by default unless one is manually
	passed into the function.

## Value

List output of times and if the current date is a trading day

## Examples

## Not run:

```
# Access Token must be set using schwab_auth3_accessToken
# Market hours for the current date
schwab_marketHours()
schwab_marketHours('2020-06-24', 'OPTION')
```

## End(Not run)

schwab\_optionChain Get Options Chain

## Description

Search an Option Chain for a specific ticker

## Usage

```
schwab_optionChain(
   ticker,
   strikes = 10,
   inclQuote = TRUE,
   startDate = Sys.Date() + 1,
   endDate = Sys.Date() + 360,
   contractType = c("ALL", "CALL", "PUT"),
   accessTokenList = NULL
)
```

ticker	underlying ticker for the options chain
strikes	the number of strikes above and below the current strike
inclQuote	set TRUE to include pricing details (will be delayed if account is set for delayed quotes)
startDate	the start date for expiration (should be greater than or equal to today). Format: yyyy-mm-dd
endDate	the end date for expiration (should be greater than or equal to today). Format: yyyy-mm-dd
contractType	can be 'ALL', 'CALL', or 'PUT'
accessTokenList	
	A valid Access Token must be set using the output from schwab_auth3_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Details

Return a list containing two data frames. The first is the underlying data for the symbol. The second item in the list is a data frame that contains the options chain for the specified ticker.

#### Value

a list of 2 data frames - underlying and options chain

#### Examples

## End(Not run)

schwab\_optionExpiration

Get Options Expiration Chain

## Description

Search an Option Chain for a specific ticker

schwab\_optionExpiration(ticker, accessTokenList = NULL)

#### Arguments

ticker

underlying ticker for the options chain

accessTokenList

A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Details

Return a list containing two data frames. The first is the underlying data for the symbol. The second item in the list is a data frame that contains the options chain for the specified ticker.

## Value

a list of 2 data frames - underlying and options chain

## Examples

## Not run:

## End(Not run)

schwab\_orderDetail Get Details for a Single Order

## Description

Pass an order ID and Account number to get details such as status, quantity, ticker, executions (if applicable), account, etc.

## Usage

```
schwab_orderDetail(orderId, account_number, accessTokenList = NULL)
```

orderId A valid Schwab Order ID account\_number A Schwab account number associated with the Access Token accessTokenList A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

#### Value

list of order details

#### Examples

## Not run:

# Get stored refresh token
refreshToken = readRDS('/secure/location/')

```
# generate a new access token
accessTokenList = schwab_auth3_accessToken('AppKey', 'AppSecret', refreshToken)
```

```
# Get order details for a single order
# Passing Access Token is optional once it's been set
schwab_orderDetail(orderId = 123456789, account_number = 987654321)
```

## End(Not run)

schwab\_orderSearch Search for orders by date

## Description

Search for orders associated with a Schwab account over the previous 60 days. The result is a list of three objects:

- 1. jsonlite formatted extract of all orders
- 2. all entered orders with details
- 3. a data frame of all executed orders with the executions

#### Usage

```
schwab_orderSearch(
    account_number,
    startDate = Sys.Date() - 30,
    endDate = Sys.Date(),
```

```
maxResults = 50,
orderStatus = "",
accessTokenList = NULL
)
```

account_number	A Schwab account number associated with the Access Token
startDate	Orders from a certain date with. Format yyyy-mm-dd.
endDate	Filter orders that occurred before a certain date. Format yyyy-mm-dd
maxResults	the max results to return in the query
orderStatus	search by order status (ACCEPTED, FILLED, EXPIRED, CANCELED, RE- JECTED, etc). This can be left blank for all orders. See documentation for full list
accessTokenList	
	A valid Access Taken must be set using the output from schwab, outb3, access Taken

A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Value

a list of three objects: a jsonlite formatted extract of all orders, all entered orders with details, a data frame of all executed orders with the executions

## Examples

## End(Not run)

schwab\_placeOrder Place Order for a specific account

## Description

Place trades through the SchwabAPI using a range of parameters

```
schwab_placeOrder(
 account_number,
  ticker,
 quantity,
  instruction,
 orderType = "MARKET",
 limitPrice = NULL,
  stopPrice = NULL,
 assetType = c("EQUITY", "OPTION"),
 session = "NORMAL",
 duration = "DAY",
  stopPriceBasis = NULL,
  stopPriceType = NULL,
  stopPriceOffset = NULL,
 accessTokenList = NULL
)
```

## Arguments

account_number	A Schwab account number associated with the Access Token
ticker	a valid Equity/ETF or option. If needed, use schwab_symbolDetail to confirm. This should be a ticker/symbol, not a CUSIP
quantity	the number of shares to be bought or sold. Must be an integer.
instruction	Equity instructions include 'BUY', 'SELL', 'BUY_TO_COVER', or 'SELL_SHORT'. Options instructions include 'BUY_TO_OPEN', 'BUY_TO_CLOSE', 'SELL_TO_OPEN', or 'SELL_TO_CLOSE'
orderType	MARKET, LIMIT (requiring limitPrice), STOP (requiring stopPrice), STOP_LIMIT, TRAILING_STOP (requiring stopPriceBasis, stopPriceType, stopPriceOffset)
limitPrice	the limit price for a LIMIT or STOP_LIMIT order
stopPrice	the stop price for a STOP or STOP_LIMIT order
assetType	EQUITY or OPTION. No other asset types are available at this time. EQUITY is the default.
session	NORMAL for normal market hours, AM or PM for extended market hours
duration	how long will the trade stay open without a fill: DAY, GOOD_TILL_CANCEL, FILL_OR_KILL
stopPriceBasis	LAST, BID, or ASK which is the basis for a STOP, STOP_LIMIT, or TRAIL-ING_STOP
stopPriceType	the link to the stopPriceBasis. VALUE for dollar difference or PERCENT for a percentage offset from the price basis
stopPriceOffset	
	an integer that indicates the offset used for the stopPriceType, 10 and PERCENT is a 10 percent offset from the current price basis. 5 and VALUE is a 5 dollar offset from the current price basis

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accessTokenList

A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Details

A valid account and access token must be passed. An access token will be passed by default when schwab\_auth3\_accessToken is executed successfully and the token has not expired, which occurs after 30 minutes. Only simple orders using equities and options can be traded at through this function at this time. This function is built to allow a single trade submission. More complex trades can be executed through the API, but a custom function or submission will need to be constructed. To build more custom trading strategies, reference the 'Schwab API' examples. A full list of the input parameters and details can be found in the documentation. TEST ALL ORDERS FIRST WITH SMALL DOLLAR AMOUNTS!!!

A minimum of four parameters are required for submission: ticker, instruction, quantity, and account number associated with the Access Token. The following parameters default: session - NOR-MAL, duration - DAY, asset type - EQUITY, and order type - MARKET

#### Value

the trade id, account id, and other order details

#### Warning

TRADES THAT ARE SUCCESSFULLY ENTERED WILL BE SUBMITTED IMMEDIATELY THERE IS NO REVIEW PROCESS. THIS FUNCTION HAS HUNDREDS OF POTENTIAL COMBINATIONS AND ONLY A HANDFUL HAVE BEEN TESTED. IT IS STRONGLY REC-OMMENDED TO TEST THE DESIRED ORDER ON A VERY SMALL QUANTITY WITH LITTLE MONEY AT STAKE. ANOTHER OPTION IS TO USE LIMIT ORDERS FAR FROM THE CURRENT PRICE. TD AMERITRADE HAS THEIR OWN ERROR HANDLING BUT IF A SUCCESSFUL COMBINATION IS ENTERED IT COULD BE EXECUTED IMMEDIATELY. DOUBLE CHECK ALL ENTRIES BEFORE SUBMITTING.

#### Examples

## Not run:

# Get stored refresh token
refreshToken = readRDS('/secure/location/')

# generate a new access token
accessTokenList = schwab\_auth3\_accessToken('AppKey', 'AppSecret', refreshToken)

# Set Account Number
account\_number = 1234567890

# Standard market buy order # Every order must have at least these 4 paramters schwab\_placeOrder(account\_number = account\_number,

```
ticker = 'AAPL',
                  quantity = 1,
                  instruction = 'buy')
# Stop limit order - good until canceled
schwab_placeOrder(account_number = account_number,
            ticker = 'AAPL',
            quantity = 1,
            instruction = 'sell',
            duration = 'good_till_cancel',
            orderType = 'stop_limit',
            limitPrice = 98,
            stopPrice = 100)
# Trailing Stop Order
schwab_placeOrder(account_number = account_number,
            ticker='AAPL',
            quantity = 1,
            instruction='sell',
            orderType = 'trailing_stop',
            stopPriceBasis = 'BID',
            stopPriceType = 'percent',
            stopPriceOffset = 10)
# Option Order with a limit price
## End(Not run)
```

schwab\_priceHistory Get price history for a multiple securities

## Description

Open, Close, High, Low, and Volume for one or more securities

### Usage

```
schwab_priceHistory(
  tickers = c("AAPL", "MSFT"),
  startDate = Sys.Date() - 30,
  endDate = Sys.Date(),
  freq = c("daily", "1min", "5min", "10min", "15min", "30min"),
  accessTokenList = NULL
)
```

## Arguments

tickers a vector of tickers - no more than 15 will be pulled. for bigger requests, split up the request or use the 'Tiingo API', 'FMP Cloud API', or other free data providers

startDate	the Starting point of the data
endDate	the Ending point of the data
freq	the frequency of the interval. Can be daily, 1min, 5min, 10min, 15min, or 30min
accessTokenLis	t
	A valid Access Token must be set using the output from schwab_auth3_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

#### Details

Pulls price history for a list of security based on the parameters that include a date range and frequency of the interval. Depending on the frequency interval, data can only be pulled back to a certain date. For example, at a one minute interval, data can only be pulled for 30-35 days. Prices are adjusted for splits but not dividends.

PLEASE NOTE: Large data requests will take time to pull back because of the looping nature. The 'Schwab API' does not allow bulk ticker request, so this is simply running each ticker individually. For faster and better historical data pulls, try the 'Tiingo API' or 'FMP Cloud API'

#### Value

a tibble of historical price data

#### Examples

```
## Not run:
# Set the access token and a provide a vector of one or more tickers
refreshToken = readRDS('/secure/location/')
accessToken = schwab_auth_accessToken(refreshToken, 'consumerKey')
tickHist5min = schwab_priceHistory(c('TSLA','AAPL'), freq='5min')
# The default is daily. Access token is optional once it's been set
tickHistDay = schwab_priceHistory(c('SPY','IWM'), startDate = '1990-01-01')
```

## End(Not run)

schwab\_priceQuote Get Quotes for specified tickers in List form

#### Description

Enter tickers for real time or delayed quotes returned as a list

```
schwab_priceQuote(
  tickers = c("AAPL", "MSFT"),
  output = "df",
  accessTokenList = NULL
)
```

## Arguments

tickers	One or more tickers
output	indication on whether the data should be returned as a list or df. The default is 'df' for data frame, anything else would be a list.
accessTokenLis	t
	A valid Access Token must be set using the output from schwab_auth3_accessToken. The most recent Access Token will be used by default unless one is manually

Details

Quotes may be delayed depending on agreement with Schwab. If the account is set up for real-time quotes then this will return real-time. Otherwise the quotes will be delayed.

#### Value

a list or data frame with quote details for each valid ticker submitted

passed into the function.

## Examples

```
## Not run:
# Get stored refresh token
refreshToken = readRDS('/secure/location/')
# generate a new access token
accessToken = schwab_auth_accessToken('consumerKey', refreshToken)
# Pass one or more tickers as a vector
# accessToken is optional once it is set
quoteSPY = schwab_priceQuote('SPY')
quoteList = schwab_priceQuote(c('GOOG','TSLA'), output = 'list', accessToken)
```

## End(Not run)

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## Description

Get identifiers and fundamental data for a specific ticker

## Usage

```
schwab_symbolDetail(tickers = c("AAPL", "SPY"), accessTokenList = NULL)
```

## Arguments

tickers valid ticker(s) or symbol(s)

accessTokenList

A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

#### Value

data frame of ticker details

## Examples

## Not run:

# Details for Apple
schwab\_symbolDetail('AAPL')

## End(Not run)

schwab\_transactSearch Search for all Transaction types

## Description

Can pull trades as well as transfers, dividend reinvestment, interest, etc. Any activity associated with the account.

```
schwab_transactSearch(
 account_number,
 startDate = Sys.Date() - 30,
 endDate = Sys.Date(),
 transType = "TRADE",
 accessTokenList = NULL
)
```

## Arguments

account_number	A Schwab account number associated with the Access Token
startDate	Transactions after a certain date. Will not pull back transactions older than 1 year. format yyyy-mm-dd
endDate	Filter transactions that occurred before a certain date. format yyyy-mm-dd
transType	Filter for a specific Transaction type. No entry will return all types. For example: TRADE, CASH_IN_OR_CASH_OUT, CHECKING, DIVIDEND, IN-TEREST, OTHER
accessTokenList	
	A valid Access Token must be set using the output from schwab_auth3_accessToken The most recent Access Token will be used by default unless one is manually passed into the function.

## Value

a jsonlite data frame of transactions

## Examples

## Not run:

## End(Not run)

schwab\_userPreferences

Get User Preferences

## Description

Returns a dataframe output for account preferences associated with user

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schwab\_userPreferences(accessTokenList = NULL)

## Arguments

accessTokenList

A valid Access Token must be set using the output from schwab\_auth3\_accessToken. The most recent Access Token will be used by default unless one is manually passed into the function.

## Value

Dataframe output of account details

## Examples

## Not run:

```
# Access Token must be set using schwab_auth3_accessToken
# Market hours for the current date
schwab_userPreferences()
```

## End(Not run)

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