The R package **rbtc**: Implementation of the core Bitcoin's API

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Contents

Overview

- A (partial) implementation of the BitCoin API (see Antonopoulos (2017) and `https://bitcoin.org/en/developer-reference`).
- Purely written in R and utilizes S4-classes and methods.
- Dependencies to the packages **httr** (see Wickham, 2017) and **rjson** (see Couture-Beil, 2014) for conducting calls to and receiving responses from the RPC-JSON API.
- Requirement(s): bitcoin-core/bitcoind; configuration file.
- Hosted on GitHub: https://github.com/bpfaff/rbtc/

Categories of functions (in alphabetical order)

1. Blockchain
2. Control
3. Generating
4. Mining
5. Network
6. Rawtransactions
7. Util
8. Wallet

Example I

Kids in the block . . .

```
> library(rbtc)
> obj <- conrpc("btcfull.conf")
> ## Start bitcoind
> startbtc(obj)
> ## Help on API functions
> ## gethelp(obj) # overview
> ## gethelp(obj, "getblock") # specific man page
> ## Kids in a block ...
> bhash <- getblockhash(obj, 277316)
> class(bhash)
[1] "ANSRPC"
attr(,"package")
[1] "rbtc"
> slotNames(bhash)
[1] "rpcname"  "result"   "ecode"    "emessage" "id"
```

Example II

Kids in the block . . .

```
> (hash <- slot(bhash, "result")) # reverse order
[1] "000000000000001b6b9a13b095e96db41c4a928b97ef2d944a9b31b2cc7bd
> block <- getblock(obj, hash, verbosity = "12")
> txlist <- slot(block, "result")$tx
> length(txlist) # 419 transactions in this block
[1] 419
> txolist <- lapply(txlist, function(x) x$vout)
> txovlist <- lapply(txolist,
+                    function(x){
+                        unlist(lapply(x, function(x) x$value))
+                        })
> TxOutValuesInBlock <- lapply(txovlist, sum)
> (OutValueInBlock <- sum(unlist(TxOutValuesInBlock)))
[1] 10322.08
```

Summary

- By now, partial implementation of Bitcoin API.
- Useful for investigating the blockchain and deriving descriptive statistics.
- Complementary to the R packages **rbitcoin** (see Gorecki, 2014) and **coindeskr** (see AbdulMajedRaja, 2018), *i.e.* linking summary statistics derived from the chain with BTC price history.
- **rbtc** still in development; further API calls will be implemented.

Session Information I

```
> library(rbtc)
> sessionInfo()

R version 3.4.3 (2017-11-30)
Platform: i686-pc-linux-gnu (32-bit)
Running under: Debian GNU/Linux buster/sid

Matrix products: default
BLAS: /usr/lib/i386-linux-gnu/atlas/libblas.so.3.10.3
LAPACK: /usr/lib/i386-linux-gnu/atlas/liblapack.so.3.10.3

locale:
 [1] LC_CTYPE=de_DE.utf8       LC_NUMERIC=C
 [3] LC_TIME=de_DE.utf8        LC_COLLATE=de_DE.utf8
 [5] LC_MONETARY=de_DE.utf8    LC_MESSAGES=de_DE.utf8
 [7] LC_PAPER=de_DE.utf8       LC_NAME=C
 [9] LC_ADDRESS=C              LC_TELEPHONE=C
[11] LC_MEASUREMENT=de_DE.utf8 LC_IDENTIFICATION=C

attached base packages:
[1] stats     graphics  grDevices utils     datasets  methods   base

other attached packages:
[1] rbtc_0.1-1

loaded via a namespace (and not attached):
[1] httr_1.3.1     compiler_3.4.3 rjson_0.2.15   R6_2.1.2       tools_3.4.3
```

Bibliography I

AbdulMajedRaja, R. (2018). *coindeskr: Access 'CoinDesk' Bitcoin Price Index API*. R package version 0.1.0.

Antonopoulos, A. (2017). *Mastering Bitcoin: Programming the Open Blockchain* (2nd ed.). Sebastopol, CA: O'Reilly Media. https://github.com/bitcoinbook/bitcoinbook.

Couture-Beil, A. (2014). *rjson: JSON for R*. R package version 0.2.15.

Gorecki, J. (2014). *Rbitcoin: R & bitcoin integration*. R package version 0.9.2.

Wickham, H. (2017). *httr: Tools for Working with URLs and HTTP*. R package version 1.3.1.

Announcement: First DSF-R Conference

- The International Conference on Data Science in Finance with R – Demystifying the buzz around Artificial Intelligence in Finance.
- URL: http://dsf.academy/conference/.
- Location: WU Vienna (new campus).
- Date: September 13–14 2018.
- Registration and call for paper(s) is open now.