Read FAME databases from R

FAME databases map names to data structures. FAME data types include:

- BOOLEAN
- DATE (at various frequencies)
- NUMERIC
- PRECISION
- STRING

The *rhli* package maps FAME data types to compatible basic R data types. The *qoma.smuggler* package constructs more complex *tidyverse* data structures such as `Date` and `tibble`. *qoma.smuggler* defines an R reference class `List` which implements a mutable `list` to hold FAME data.

The utility function `open_hli()` opens the FAME environment and prints diagnostic information.

```
library(qoma.smuggler)
library(rhli)

if(!open_hli())knitr::knit_exit()
```

```
Linux 4.9.0-4-amd64 #1 SMP Debian 4.9.65-3+deb9u1 (2017-12-23) GNU/Linux

R version 3.5.0 (2018-04-23)
Joy in Playing
x86_64-redhat-linux-gnu

lubridate        1.7.4
qoma.smuggler    0.0.1
rhli             0.0.2
tibble           1.4.2
FAME HLI        11.63000
```

The FAME distribution includes a number of sample databases. We will use the DRI Economics *driecon* sample database for this notebook.

```
dbname <- paste(Sys.getenv("FAME"),"util","driecon",sep="/")
cat(dbname)
```

```
/opt/pkg/fame116linux/util/driecon
```

The *qoma.smuggler* function `read_fame()` reads FAME data objects into a *qoma.smuggler* `List`. By default, the function `read_fame()` loads the entire specified database to a *qoma.smuggler* `List`.

```
famedata <- read_fame(dbname)
```

```
read_fame() returns 55 objects from /opt/pkg/fame116linux/util/driecon
```

The method `get_data(objectName)` returns FAME data for objectName from the *qoma.smuggler* `List`. For FAME SCALAR objects, `get_data(objectName)` returns one value. For FAME SERIES objects, `get_data(objectName)` returns a `tibble` with multiple values.

```
famedata$get_data('GDP')
```

```
# A tibble: 74 x 2
   date         GDP
   <date>     <dbl>
```

```
 1 1929-12-31 104.
 2 1930-12-31  91.3
 3 1931-12-31  76.6
 4 1932-12-31  58.8
 5 1933-12-31  56.4
 6 1934-12-31  66
 7 1935-12-31  73.3
 8 1936-12-31  83.7
 9 1937-12-31  91.9
10 1938-12-31  86.1
# ... with 64 more rows
```

The method `get_meta(objectName)` returns FAME object meta data as a string from a *qoma.smuggler* `List`.

```
cat(famedata$get_meta('GDP'))
```

```
SERIES GDP : PRECISION BY DATE(ANNUAL) 1929 to 2002
GROSS DOMESTIC PRODUCT
-
GROSS DOMESTIC PRODUCT
BILLIONS OF CURRENT DOLLARS
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS
'SURVEY OF CURRENT BUSINESS' AND OTHER MATERIALS
U.S. NATIONAL INCOME & PRODUCT ACCOUNTS - TABLE 1.1,1.3,1.5,1.9
```

Specifying a wildcard pattern will select a subset of the data objects with a compatible pattern. You may specify an full name, retrieving one series.

```
wilnam <- "ip?"
famedata <- read_fame(dbname,wilnam)
```

```
read_fame() returns 9 objects from /opt/pkg/fame116linux/util/driecon
```

The function `print_catalog()` will display summary meta data for the contents retrieved. For brevity, we specify optional parameter `list.len = 3` to limit output.

```
print_catalog(famedata,list.len = 3)
```

```
SERIES IPSB50001 : PRECISION BY DATE(MONTHLY) Jan1919 to Jul2003
INDUSTRIAL PRODUCTION INDEX -  TOTAL INDEX
-
INDUSTRIAL PRODUCTION INDEX -  TOTAL INDEX
UNITS 1997=100, SEASONALLY ADJUSTED
FRB, INDUSTRIAL PRODUCTION, G.17;

SERIES IPSB51214 : PRECISION BY DATE(MONTHLY) Jan1954 to Jul2003
INDUSTRIAL PRODUCTION INDEX -  PAPER PRODUCTS
-
INDUSTRIAL PRODUCTION INDEX -  PAPER PRODUCTS
UNITS 1997=100, SEASONALLY ADJUSTED
FRB, INDUSTRIAL PRODUCTION, G.17;

SERIES IPSB52100 : PRECISION BY DATE(MONTHLY) Jan1947 to Jul2003
INDUSTRIAL PRODUCTION INDEX -  BUSINESS EQUIPMENT
-
INDUSTRIAL PRODUCTION INDEX -  BUSINESS EQUIPMENT
UNITS 1997=100, SEASONALLY ADJUSTED
```

```
FRB, INDUSTRIAL PRODUCTION, G.17;


[catalog output truncated, 6 more entries not displayed because list.len=3]
```

Specifying a date range will select a subset of the database with specified frequency. Here we use the FAME HLI constant `HANDEC` which means *ANNUAL(DECEMBER)* frequency. See the FAME support website CHLI documentation for available codes. Data returned will be limited to the specified date range.

```
range <- to_fame_range(HANDEC,"1993","2002")
famedata <- read_fame(dbname,fame_range_ = range)
```

```
read_fame() returns 16 objects from /opt/pkg/fame116linux/util/driecon
```

```
print_catalog(famedata,list.len = 2)
```

```
SERIES $N : PRECISION BY DATE(ANNUAL) 1993 to 2002
POPULATION INCLUDING ARMED FORCES OVERSEAS (P25E)
-
POPULATION INCLUDING ARMED FORCES OVERSEAS (P25E)
MILLIONS OF PERSONS, ESTIMATES ARE FOR JULY 1
U.S. DEPARTMENT OF COMMERCE, BUREAU OF THE CENSUS
CURRENT POPULATION REPORTS, SERIES P-25
INCLUDING ALASKA AND HAWAII BEGINNING IN 1940

SERIES BOPMERCH : PRECISION BY DATE(ANNUAL) 1993 to 2002
US INTERNATIONAL TRANSACTIONS - BALANCE ON GOODS (BOP)
-
US INTERNATIONAL TRANSACTIONS - BALANCE ON GOODS (BOP)
BILLIONS OF CURRENT DOLLARS
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS
U.S. INTERNATIONAL TRANSACTIONS


[catalog output truncated, 14 more entries not displayed because list.len=2]
```

Note the data retrieved is for the specified date range only; not an objects full date range:

```
famedata$get_data('GDP')
```

```
# A tibble: 10 x 2
   date          GDP
   <date>      <dbl>
 1 1993-12-31  6642.
 2 1994-12-31  7054.
 3 1995-12-31  7400.
 4 1996-12-31  7813.
 5 1997-12-31  8318.
 6 1998-12-31  8782.
 7 1999-12-31  9274.
 8 2000-12-31  9825.
 9 2001-12-31 10082.
10 2002-12-31 10446.
```

The *qoma.smuggler* utility function `close_hli()` closes the FAME environment.

```
close_hli()
```

```
[1] TRUE
```