3_Example_DateRangeConversion

August 18, 2018

1 Pandas and FAME date ranges

Pandas and FAME represent date ranges differently. This notebook illustrates converting from FAME range to Pandas range using Qoma utilities package `qomautils`.

This notebook utilizes FAME HLI (host language interface) function `fame_current_tme()` exposed by the `pyhli` package to obtain current date at various frequencies: current business day, current hour, current minute, ...

The test performed below for a variety of FAME frequencies is: * convert the FAME `[]int` range to Pandas `DatetimeIndex` * convert the Pandas `DatetimeIndex` back to FAME `[]int` range * verify the FAME input range and output range match

```
In [1]: import os
        from __future__ import print_function

        import pandas as pd
        import pyhli
        import qoma_smuggler as qm
```

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

```
In [2]: if qm.open_hli()!=0:
            raise
```

```
Linux 4.9.0-4-amd64 (#1 SMP Debian 4.9.65-3+deb9u1 (2017-12-23)) x86_64
Python 3.6.5 | packaged by conda-forge | (default, Apr  6 2018, 13:39:56)
[GCC 4.8.2 20140120 (Red Hat 4.8.2-15)]
NumPy 1.13.3 Pandas 0.23.4 FAME HLI 11.63000 pyhli 0.0.11 qoma-smuggler 0.0.2
```

Each frequency key in the FAME frequency to Pandas frequency map `pandasFreq` will be tested below. A mutable length-one integer array is provided to the FAME HLI routine `fame_current_time()` to obtain the current date at a specified frequency.

```
In [3]: date = [-1]
        for freq in qm.PANDAS_FREQ:
            # at each frequency, ask FAME for current date
```

```
            status = pyhli.fame_current_time(freq, date)
            now = date[0]
            then = now-4

            # FAME range specifies: freq,start,end
            frng_in = [freq,then,now]
            # get Pandas range from FAME range
            prng = qm.to_pandas_range(frng_in)
            # get FAME range from Pandas range
            frng_out = qm.to_fame_range(prng)

            # check that the FAME range in matches the FAME range out
            matchString = "match" if frng_in == frng_out else "NO MATCH"
            print("{0}\n{1:10s} FAME in {2} FAME out {3}\nPandas interim\n{4}\n".format(
                qm.type_to_string(freq),
                matchString,
                frng_in,
                frng_out,
                prng
            ))
```

```
DATE(ANNUAL)
match      FAME in [203, 165, 169] FAME out [203, 165, 169]
Pandas interim
DatetimeIndex(['2014-12-31', '2015-12-31', '2016-12-31', '2017-12-31',
               '2018-12-31'],
              dtype='datetime64[ns]', freq='A-DEC')

DATE(QUARTERLY)
match      FAME in [162, 671, 675] FAME out [162, 671, 675]
Pandas interim
DatetimeIndex(['2017-09-30', '2017-12-31', '2018-03-31', '2018-06-30',
               '2018-09-30'],
              dtype='datetime64[ns]', freq='Q-DEC')

DATE(MONTHLY)
match      FAME in [129, 2020, 2024] FAME out [129, 2020, 2024]
Pandas interim
DatetimeIndex(['2018-04-30', '2018-05-31', '2018-06-30', '2018-07-31',
               '2018-08-31'],
              dtype='datetime64[ns]', freq='M')

DATE(WEEKLY(FRIDAY))
match      FAME in [21, 8795, 8799] FAME out [21, 8795, 8799]
Pandas interim
DatetimeIndex(['2018-07-27', '2018-08-03', '2018-08-10', '2018-08-17',
               '2018-08-24'],
              dtype='datetime64[ns]', freq='W-FRI')
```

```
DATE(BUSINESS)
match      FAME in [9, 43991, 43995] FAME out [9, 43991, 43995]
Pandas interim
DatetimeIndex(['2018-08-14', '2018-08-15', '2018-08-16', '2018-08-17',
               '2018-08-20'],
              dtype='datetime64[ns]', freq='B')

DATE(DAILY)
match      FAME in [8, 61587, 61591] FAME out [8, 61587, 61591]
Pandas interim
DatetimeIndex(['2018-08-14', '2018-08-15', '2018-08-16', '2018-08-17',
               '2018-08-18'],
              dtype='datetime64[ns]', freq='D')
```

The Qoma utility function `close_hli()` closes the FAME environment.

```
In [4]: if qm.close_hli()!=0:
            raise
```