Index, attributes, and time zones

MANIPULATING TIME SERIES DATA WITH XTS AND ZOO IN R

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datacamp

What is the index?

Raw seconds since 1970-01-01 UTC

- `tclass` or `indexClass` : attribute for extraction

- `tzone` or `indexTZ` : attribute for time zones

- `indexFormat` : optional display preferences

```
indexClass(Z)
```

"Date"

```
indexTZ(Z)
```

"UTC"

```
indexFormat(Z) <- "%b %d, %Y"
Z
```

```
              Z
Aug 09, 2016  1
Aug 10, 2016  4
```

Understanding TZ

- Describe time offset from UTC (a.k.a. Greenwich Mean Time)

- Always set your time zone to avoid surprises!

```
Sys.setenv(TZ = "America/Chicago")
Sys.setenv(TZ = "UTC")
```

- Know your time zones

```
help(OlsonNames)    # Great read!
```

Let's practice!

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Periods, periodicity and timestamps

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Final topics

- Find the time an object covers

- Find periods within your object

- Account for duplicates and false precision

periodicity()

- Identifies the regularity of data

- Answers what type of data is present

- Less useful for irregular timestamps

- Summary measure for the index

```
periodicity(edhec)
```

```
Monthly periodicity from 1997-01-31 to 2009-08-31
```

```
periodicity(to.yearly(edhec))
```

```
Yearly periodicity from 1997-12-31 to 2009-08-31
```

Counting periods

- Estimate number of periods (e.g. days, weeks)

- Irregular series equals irregular counting

- Counts periods greater than periodicity

```
nseconds(x)
nminutes(x)
nhours(x)
ndays(x)
nweeks(x)
nmonths(x)
nquarters(x)
nyears(x)
```

Broken down time with .index*

- Time expressed as POSIXlt components
  - sec, min, hour, mday, mon, year, wday, yday, isdst

```
index(Z)
```

```
"2016-08-09" "2016-08-10"
"2016-08-11" "2016-08-12"
```

```
.indexmday(Z)
```

```
9 10 11 12
```

```
.indexyday(Z)
```

```
221 222 223 224
```

```
# add origin
.indexyear(Z) + 1900
```

```
2016 2016 2016 2016
```

Modifying timestamps

- Use align.time() to round time stamps to another period

```r
align.time(x, n = 60)   # n is in seconds
```

- Useful to remove observations of duplicate timestamps

```r
make.index.unique(x,
                  eps = 1e-06,
                  drop = FALSE,
                  fromLast = FALSE, ...)
```

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