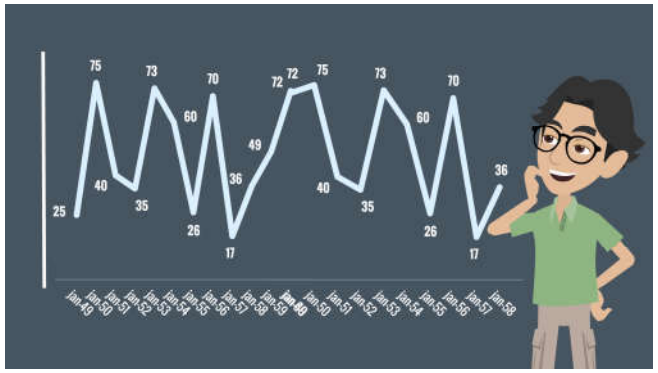

Séries Temporais e Análises Preditivas

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Task view

CRAN Task View: Time Series Analysis

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Base R ships with a lot of functionality useful for time series, in particular in the stats package. This is complemented by many packages on CRAN, which are briefly summarized below. There is also a considerable overlap between the tools for time series and those in the Econometrics and Finance task views. The packages in this view can be roughly structured into the following topics. If you think that some package is missing from the list, please let us know.

Basics

- *Infrastructure* : Base R contains substantial infrastructure for representing and analyzing time series data. The fundamental class is `"ts"` that can represent regularly spaced time series (using numeric time stamps). Hence, it is particularly well-suited for annual, monthly, quarterly data, etc.
- *Rolling statistics* : Moving averages are computed by `ma` from forecast, and `rollmean` from zoo. The latter also provides a general function `rollapply`, along with other specific rolling statistics functions. tsibble provides `slide()` for rolling statistics, `tile()` for non-overlapping sliding windows, and `stretch()` for expanding windows. roll provides parallel functions for computing rolling statistics. Fast rolling and expanding window regressions are provided by rollRegres.
- *Graphics* : Time series plots are obtained with `plot()` applied to `ts` objects. (Partial) autocorrelation functions plots are implemented in `acf()` and `pacf()`. Alternative versions are provided by `Acf()` and `Pacf()` in forecast, along with a combination display using `tsdisplay()`. SDD provides more general serial dependence diagrams, while dCovTS computes and plots the distance covariance and correlation functions of time series. Seasonal displays are obtained using `monthplot()` in stats and `seasonplot` in forecast. Wats implements wrap-around time series graphics. ggseas provides ggplot2 graphics for seasonally adjusted series and rolling statistics. dygraphs provides an interface to the Dygraphs interactive time series charting library. TSstudio provides some interactive visualization tools for time series. ZRA plots forecast objects from the forecast package using dygraphs. Basic fan plots of forecast distributions are provided by forecast and vars. More flexible fan plots of any sequential distributions are implemented in fanplot.

Times and Dates

- Class `"ts"` can only deal with numeric time stamps, but many more classes are available for storing time/date information and computing with it. For an overview see *R Help Desk: Date and Time Classes in R* by Gabor Grothendieck and Thomas Petzoldt in R News 4(1), 29-32.
- Classes `"yearmon"` and `"yearqtr"` from zoo allow for more convenient computation with monthly and quarterly observations, respectively.
- Class `"Date"` from the base package is the basic class for dealing with dates in daily data. The dates are internally stored as the number of days since 1970-01-01.
- The chron package provides classes for `dates()`, `hours()` and date/time (intra-day) in `chron()`. There is no support for time zones and daylight savings time. Internally, `"chron"` objects are (fractional) days since 1970-01-01.
- Classes `"POSIXct"` and `"POSIXlt"` implement the POSIX standard for date/time (intra-day) information and also support time zones and daylight savings time. However, the time zone computations require some care and might be system-dependent. Internally, `"POSIXct"` objects are the number of seconds since 1970-01-01 00:00:00 GMT. Package lubridate provides functions that facilitate certain POSIX-based computations. timechange allows for efficient manipulation of date-times accounting for time zones and daylight saving times. wktmo converts weekly data to monthly data in several different ways.
- Several packages aim to handle time-based tibbles: tsibble provides tidy temporal data frames and associated tools; tibbletime handles time aware tibbles; timetk contains tools for working with and coercing between time-based tibbles, xts, zoo and ts objects. tsbox is another toolkit for converting between various time series data classes.
- Class `"timeDate"` is provided in the timeDate package (previously: fCalendar). It is aimed at financial time/date information and deals with time zones and daylight savings times via a new concept of "financial centers". Internally, it stores all information in `"POSIXct"` and does all computations in GMT only. Calendar functionality, e.g., including information about weekends and holidays for various stock exchanges, is also included.
- The tis package provides the `"ti"` class for time/date information.
- The `"mondate"` class from the mondate package facilitates computing with dates in terms of months.
- The tempdisagg package includes methods for temporal disaggregation and interpolation of a low frequency time series to a higher frequency series.
- Time series disaggregation is also provided by tsdisagg2.
- TimeProjection extracts useful time components of a date object, such as day of week, weekend, holiday, day of month, etc, and put it in a data frame.

Time Series Classes

- As mentioned above, `"ts"` is the basic class for regularly spaced time series using numeric time stamps.
- The zoo package provides infrastructure for regularly and irregularly spaced time series using arbitrary classes for the time stamps (i.e., allowing all classes from the previous section). It is designed to be as consistent as possible with `"ts"`. Coercion from and to `"zoo"` is available for all other classes mentioned in this section.
- The package xts is based on zoo and provides uniform handling of R's different time-based data classes.
- Various packages implement irregular time series based on `"POSIXct"` time stamps, intended especially for financial applications. These include `"irts"` from tseries, and `"fts"` from fts.
- The class `"timeSeries"` in timeSeries (previously: fSeries) implements time series with `"timeDate"` time stamps.
- The class `"tis"` in tis implements time series with `"ti"` time stamps.
- The package tframe contains infrastructure for setting time frames in different formats.

Forecasting and Univariate Modeling