Package ‘stlpro’

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Type Package

Title STL with Extended Capabilities

Version 0.1.0

Description Implements a Seasonal-Trend decomposition procedure based on LOESS (STL, developed by Cleveland, Cleveland, McRae, and Terpenning, 1990) in 'R' and 'C++'. The package supports missing values, fractional seasonal periods, multiplicative decompositions, and cross-validation based selection of the seasonal smoothing window.

License GPL (>= 3)

Encoding UTF-8

Imports Rcpp

LinkingTo Rcpp

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Contents

plot.stlpro 2
print.cv_results 3
stl 3

Index **6**

plot.stlpro *Plot an STL decomposition fitted by stlpro Plot the reconstructed observed series and its seasonal, trend, and remainder components.*

Description

Plot an STL decomposition fitted by stlpro

Plot the reconstructed observed series and its seasonal, trend, and remainder components.

Usage

```
## S3 method for class 'stlpro'
plot(
  x,
  plot_type = c("multiple", "single"),
  multiplicative = NULL,
  xlab = "",
  ylab = "data",
  main = NULL,
 labels = c("Unadjusted and adjusted series", "Seasonal component", "Trend component",
    "Remainder component"),
  col = c("#071108", "#D31B0D", "#d35e13", "#417246", "#2274A5"),
  lwd = 1,
  ...
)
```

Arguments

x	An object returned by stl().
plot_type	Either "multiple" for one panel per component or "single" for one plot containing all components.
multiplicative	Logical. Is the decomposition multiplicative? If NULL, the method looks for x$call$multiplicative. If this is not available, as in older stlpro objects, an additive decomposition is assumed.
xlab	Label for the x-axis.
ylab	Label for the y-axis of the observed-data panel.
main	Optional overall plot title.
labels	Optional character vector of length four giving labels for the observed, seasonal, trend, and remainder panels.
col	Colours used for the observed, seasonally adjusted, seasonal, trend, and remainder series, respectively.
lwd	Line width.
...	Further graphical parameters passed to graphics::plot().

Value

Invisibly returns `x`.

`print.cv_results` *Print method for cross-validation results*

Description

Pretty-prints an object of class `"cv_results"`.

Usage

```
## S3 method for class 'cv_results'
print(x, ...)
```

Arguments

`x`	Object of class `"cv_results"` as returned by `run_cross_validation`.
`...`	Currently ignored.

Value

Invisibly returns the printed character string.

Author(s)

Daniel Ollech

`stl` *Enhanced STL Decomposition*

Description

Decompose a time series into seasonal, trend, and remainder components using STL, optionally with robust fitting. Compare to stats::stl it included cross-validation, multiplicative decompositions, allows non-integer seasonal periods and can handle missing values.

Usage

```
stl(
  y,
  period = NULL,
  multiplicative = FALSE,
  s_window = NULL,
  t_window = NULL,
  l_window = NULL,
  s_degree = 0,
  t_degree = 1,
  l_degree = 1,
  s_jump = NULL,
  t_jump = NULL,
  l_jump = NULL,
  inner = NULL,
  outer = 0,
  robust = NULL,
  s_window_candidates = c(7, 9, 13, 19, 37),
  error_metric = "RMSE"
)
```

Arguments

y	Numeric vector or time series.
period	Seasonal period, can be non-integer. If NULL and y is ts, uses frequency(y).
multiplicative	Logical. If TRUE a multiplicative decomposition is calculated, additive otherwise.
s_window	Seasonal window (odd integer >= 3). If NULL, is set using cross-validation.
t_window	Trend window (odd integer >= 3). If NULL, uses the default, namely nextodd(ceiling((1.5*period) / (1-(1.5/s_window)))).
l_window	Low-pass window (odd integer >= 3). If NULL, uses default.
s_degree	Degree of locally-fitted polynomial in seasonal smoothing (0 or 1).
t_degree	Degree of locally-fitted polynomial in trend smoothing (0 or 1).
l_degree	Degree of locally-fitted polynomial in low-pass smoothing (0 or 1).
s_jump	Seasonal jump (integer >= 1). If NULL, uses default.
t_jump	Trend jump (integer >= 1). If NULL, uses default.
l_jump	Low-pass jump (integer >= 1). If NULL, uses default.
inner	Number of inner iterations. If NULL, uses a default determined by outer: one inner iteration when outer > 0, otherwise two. Ignored when robust is not NULL.
outer	Number of outer robustifying iterations (default 0). Ignored when robust is not NULL.

`robust` Logical scalar controlling the robustness iteration settings.
If `TRUE`, robust fitting is used with `inner = 1` and `outer = 15`. If `FALSE`, non-robust fitting is used with `inner = 2` and `outer = 0`. If `NULL` (the default), `inner` and `outer` are used as supplied.

`s_window_candidates` Candidates for cross-validation based selection of `s_window`.

`error_metric` Error metric used for cross-validation: `"MAE"`, `"MSE"` or `"RMSE"`.

Details

Values of `period` that are within `1e-8` of an integer are rounded to that integer. Values must be finite scalars greater than 1.

Value

A list with components: seasonal, trend, remainder, sa, weights, call, cv_results.

Author(s)

Daniel Ollech

Index

graphics::plot(), *2*

plot.stlpro, 2
print.cv_results, 3

run_cross_validation, *3*

stl, 3
stl(), *2*