

Package ‘joinpointR’

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Type Package

Title Tidy Tools for Joinpoint Regression Models

Version 0.5.0

Description Provides tools to fit joinpoint regression models with a log-linear specification by levels of a categorical variable. The package acts as a wrapper around the 'segmented' package, facilitating model fitting, selection, and interpretation. It includes functions to estimate the Annual Percent Change (APC) and the Average Annual Percent Change (AAPC), along with their 95% confidence intervals, and to generate formatted summary tables and plots of results.

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Encoding UTF-8

Imports dplyr, purrr, tidyr, tibble, ggplot2, segmented, scales, flextable, rlang, stringr, stats, officer

RoxygenNote 7.3.3

URL <https://github.com/datos-ine/joinpointR>

BugReports <https://github.com/datos-ine/joinpointR/issues>

Suggests testthat (>= 3.0.0)

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NeedsCompilation no

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get_aapc	<i>Average Annual Percent Change (AAPC)</i>
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Description

Estimates the Average Annual Percent Change (AAPC) and its 95% confidence interval. Optionally displays statistical significance using significance stars.

Usage

```
get_aapc(mod, digits = 1, show_ci = TRUE, dec = ".")
```

Arguments

mod	Joinpoint regression model (segmented object) or linear regression model (lm object).
digits	Number of decimal places to display (integer).
show_ci	Logical; if TRUE, displays the 95% confidence interval. If FALSE, displays significance stars.
dec	Character. Decimal separator to use (e.g., "." or ",").

Value

A character string with the AAPC and either its 95% confidence interval or significance stars.

Author(s)

Tamara Ricardo

Examples

```
# Load example data
data("plant", package = "segmented")

names(plant)

# Fit the joinpoint models
mods <- model_jp(data = plant, value = "y", time = "time", group = "group", k = 2, test = TRUE)
```

```
# AAPC of the first model
get_aapc(mods$RKW, digits = 1, show_ci = TRUE, dec = ".")
```

get_apc *Annual Percent Change by Segment (APC)*

Description

Calculates the Annual Percent Change (APC) for each segment and its 95% confidence interval.

Usage

```
get_apc(mod, digits = 1, time = "time", dec = ".")
```

Arguments

mod	Joinpoint regression model (segmented object).
digits	Number of decimal places to display (integer).
time	Time variable used in the model (character).
dec	Character. Decimal separator to use (e.g., "." or ",").

Value

A character vector with APC and 95% CI for each segment.

Author(s)

Tamara Ricardo

Examples

```
# Load example data
data("plant", package = "segmented")

names(plant)

# Fit the joinpoint models
mods <- model_jp(data = plant, value = "y", time = "time", group = "group", k = 2, test = TRUE)

# Obtain APC (95% CI)
get_apc(mods$RKW, digits = 1, time = "time", dec = ".")
```

`gg_jpoint`*Plot Joinpoint Regression Models*

Description

Creates a ggplot showing observed values, fitted joinpoint regression lines, and optional joinpoints.

Usage

```
gg_jpoint(mods, obs = TRUE, jp = TRUE, facets = FALSE)
```

Arguments

<code>mods</code>	List of joinpoint regression models (output of <code>model_jp()</code>).
<code>obs</code>	Logical. If TRUE, displays observed data points.
<code>jp</code>	Logical. If TRUE, displays joinpoints as vertical dashed lines.
<code>facets</code>	Logical. If TRUE, displays one panel per group using facets.

Value

A ggplot object.

Examples

```
library(dplyr)
# Load example data
data("plant", package = "segmented")

names(plant)

# Fit the joinpoint models
mods <- model_jp(data = plant, value = "y", time = "time", group = "group", k = 2, test = TRUE)

# Plot results
gg_jpoint(mods, obs = TRUE, jp = TRUE, facets = FALSE)

# Facets by group
gg_jpoint(mods, obs = TRUE, jp = TRUE, facets = TRUE)
```

model_jp	<i>Joinpoint Regression Models by Groups</i>
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Description

Fits segmented linear regression models by groups for age-standardized rates, using a stepwise procedure based on the Bayesian Information Criterion (BIC). Internally calls `segmented::selgmented()` and applies a log transformation to the response variable.

Usage

```
model_jp(data, value, time, group, k = 2, test = TRUE)
```

Arguments

data	Data frame containing age-standardized rates.
value	Response variable (character).
time	Time variable (character).
group	Grouping variable (character).
k	Maximum number of joinpoints (integer).
test	Test for differences in the t-values of the slope (logical).

Value

A list of models by group.

Author(s)

Tamara Ricardo

Examples

```
# Generate example data
library(dplyr)
df <- mtcars |>
mutate(
  year = seq(2000, length.out = n(), by = 1),
  group = factor(paste("cyl", cyl, sep = "_")),
  rate = mpg
) |>
select(year, group, rate)

# Check group levels
levels(df$group)

# Fit models
mods <- model_jp(data = df, value = "rate", time = "year", group = "group", k = 2, test = TRUE)
```

```
# Show the output of the first model
mods$cy1_6
summary(mods$cy1_6)
```

summary_jp

Summary Table For Joinpoint Regression Models

Description

Generates a table displaying the number of joinpoints, time breaks, APC and its 95% confidence interval, and AAPC and its statistical significance from a list of joinpoint models.

Usage

```
summary_jp(
  mods,
  digits = 1,
  var1 = "group",
  var2 = "subgroup",
  ft = FALSE,
  lan = c("en", "es")
)
```

Arguments

mods	List of joinpoint regression models (model_jp() output).
digits	Number of decimal places to display (integer).
var1	Character. Name of the grouping variable.
var2	Character. Name of the subgrouping variable (optional).
ft	Logical. If TRUE returns a flextable object, if FALSE returns a tibble.
lan	Language of output: "en" (English) or "es" (Spanish).

Value

A tibble or a flextable object.

Author(s)

Tamara Ricardo

Examples

```
library(dplyr)
# Load example data
data("plant", package = "segmented")

names(plant)

# Fit the joinpoint models
mods <- model_jp(data = plant, value = "y", time = "time", group = "group", k = 2, test = TRUE)

summary_jp(mods, digits = 1, var1 = "group", ft = FALSE, lan = "en")
```

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