Package 'BsplineReg'

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Title Bspline Regression Estimation

Version 0.1.0

Description Fitting a regression spline estimator based on B-spline basis.

License GPL (>= 2)

Encoding UTF-8

LazyData true

Imports ggplot2

RoxygenNote 7.3.2

Depends R (>= 2.10)

Contents

`fit_spline` *Fitting regression spline estimator*

Description

This function computes the coefficients spline regression estimator.

Usage

```
fit_spline(x_values, y_values, interior_knots, degree)
```

Arguments

`x_values`, `y_values`	Numeric vectors
`interior_knots`	Numeric vector representing interior knots sequence. It can be obtained from `knots_quantile` function based on the given x points.
`degree`	Numeric value indicating the spline degree

Value

List containing the spline coefficients estimates, knots sequence, spline degree

Examples

```
set.seed(923)
n = 30
x_values = sort(runif(n, 0, 1))
y_values = sin(2 * pi * x_values) + cos(4 * pi * x_values) + rnorm(n, sd = 0.2)
#spline degree specification
degree = 3
# knot generation
num_interior_knots = 5
interior_knots = knots_quantile(x_values, num_interior_knots)
# model fitting
model = fit_spline(x_values, y_values, interior_knots, degree)
print(model)
```

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hello *Hello, World!*

Description

Prints 'Hello, world!'.

Usage

```
hello()
```

Examples

```
hello()
```

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knots_quantile *Generating interior knots sequence for given data points*

Description

This function computes a knot sequence based on the quantiles of the data points

Usage

```
knots_quantile(x, dimension, degree = 3)
```

Arguments

x	Numeric vector representing data points
dimension	Numeric value indicating the number of basis functions
degree	Numeric value representing the spline degree

Value

Numeric vector with interior knots sequence

Examples

```
x = runif(50, 0, 1)
knots = knots_quantile(x, 5, 3)
print(knots)
```

`plot_spline` *Plotting spline estimator with scatter plots*

Description

This function provides a plot of the spline estimator with data points

Usage

```
plot_spline(x_values, y_values, model, grid_x)
```

Arguments

`x_values, y_values`	Numeric vector
`model`	List object obtained from the `fit_spline` function
`grid_x`	Numeric vector with a grid of evaluation points

`predict_spline` *Predicting the values of y for given x based on the spline estimator*

Description

This function computes the predicted values of y for given x based on the spline estimator.

Usage

```
predict_spline(model, new_x)
```

Arguments

`model`	List object obtained from the `fit_spline` function
`new_x`	Numeric vector representing a grid of evaluation points

Value

Numeric vector with predicted values at new_x

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