Package 'Kpart'

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Type Package

Title Cubic Spline Fitting with Knot Selection

Version 1.2.2

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Depends leaps

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Description Cubic spline fitting along with knot selection, includes support for additional variables.

License GPL (>= 2)

Repository CRAN

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RoxygenNote 5.0.1

NeedsCompilation no

Contents

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Description

Cubic spline regression using the absolute maximum deviate to determine potential knots. This version also includes support for addidtional independednt variables to be included in the model.

Details

Package:	Kpart
Type:	Package
Version:	1.2.2
Date:	2012-08-02
License:	Open Source

~~ This package is intended for use with non-linearly associated data. The function part firsts selects points for cubic spline knots using an algorithm to find the absolute maximum deviate from the partition mean, then fits a best fitting model by using the best subset method and maximum adjR2. The function returns the values selected as knots in the model. The function part(d, outcomeVariable, splineTerm, additionalVars = NULL, K) takes five arguments. K is a positive integer that indicates how many equally spaced partitions the user would like to search.~~

– Recent update includes support for additional variables, 2016-07-23. –

Author(s)

Eric Golinko

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References

Golinko, Eric David. A min/max algorithm for cubic splines over k-partitions. Florida Atlantic University, 2012.

Golinko, Eric, and Lianfen Qian. "A Min. Max Algorithm for Spline Based Modeling of Violent Crime Rates in USA." arXiv preprint arXiv:1804.06806 (2018).

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part	*Fits a linear model based on spline terms with additional support for other independent variables.*

Description

The user will input a data frame, then designate the variable that is the outcome. Then the spline term is selected along with any other independent variables. Finally, a number K partitions is chosen for the algorithm to search for potential cubic spline knots based on the spline term and partition.

Usage

```
part(d, outcomeVariable, splineTerm, additionalVars = NULL, K)
```

Arguments

`d`	A data frame data set with column names.
`outcomeVariable`	
	The variable from 'd' that is the outcome.
`splineTerm`	The spline term, inherited from 'd'.
`additionalVars`	A vector of additional variables to be included in the model.
`K`	The number of evenly spaced partitions to be searched.

Value

`fits`	The fitted values of the linear model.
`xhat`	The entire feature matrix.
`coefs`	The significant coefficients of the model.
`adjr2`	The adjusted R^2 value.

Author(s)

Eric Golinko

Examples

```
## for simple spline model.
data(LakeHuron)
d <- data.frame(seq(1875, 1972, 1), LakeHuron)
names(d) <- c('date', 'lh')
fit <- part(d = d, outcomeVariable = 'lh', splineTerm = 'date', K = 20)
fit
plot(d$date, d$lh)
lines(d$date, fit$fits, col = 'red')


## multivariate
data(freeny)
freeny$time <- as.numeric(rownames(freeny))
fit <- part(d = freeny, outcomeVariable = 'y',
    splineTerm = 'time', additionalVars = c('market.potential', 'income.level'), K =2)
fit$coefs
```

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