Package ‘mars’

April 12, 2022

Title Implementation of Multivariate Adaptive Regression Splines (MARS)

Version 0.0.0.9000

Description

Functions for fitting and summarizing Friedman's Multivariate Adaptive Regression Splines.

License GPL-3

Encoding UTF-8

LazyData true

Imports ISLR

Roxygen list(markdown = TRUE)

RoxygenNote 7.1.2

Suggests knitr,
rmarkdown,
testthat (>= 3.0.0)

VignetteBuilder knitr

Depends R (>= 2.10)

LazyData True

R topics documented:

A test dataset for the mars package.

Description

A dataset of size N=100 with n=10 explanatory variables, and a response variable that depends on only the first two explanatory variables.

Usage

```
marstestdata
```

Format

A data frame with 100 rows and 11 variables:

y

response variable

x1

explanatory variable

x2

explanatory variable

x3

explanatory variable

x4

explanatory variable

x5

explanatory variable

x6

explanatory variable

x7

explanatory variable

x8

explanatory variable

x9

explanatory variable

x10

explanatory variable

Multivariate Adaptive Regression Splines (MARS)

Description

Fit Friedman's Multivariate Adaptive Regression Splines (MARS) model.

Usage

```
mars(formula, data, control = NULL)
```

Arguments

`formula`
: an R formula

`data`
: a data frame containing data for use in the model

`control`
: an optional object of class 'mars.control'

Details

The model we receive at the end from the mars algorithm is a many basis functions in a linear combination, found by least squares We input a formula, data frame & control object. It uses step-wise algorithms to fit.

Value

an object of mars which has the model

Author(s)

Tauseef Kashtwari, Promit Chowdhury, Ibraheem Azad

References

Jerome H. Friedman. Multivariate Adaptive Regression Splines (with discussion).Annals of Statistics 19/1, 1991. https://statistics.stanford.edu/research/multivariate-adaptive-regression-splines.

See Also

mars.control for constructing control objects

plot.mars for plotting results

predict.mars for predictions

summary.mars for summarizing mars objects

print.mars for printing mars objects

Examples

```
mm<-mars(y~.,dat=mars::marstestdata)
```

Constructor for 'mars.control' objects

Description

Constructor for 'mars.control' objects

Usage

```
mars.control(Mmax = 2, d = 3, trace = FALSE)
```

Arguments

`Mmax`
: Maximum number of basis functions. Should be an even integer. Default value is is 2.

`d`
: The coefficient in the penalty term of the generalized cross validation measure. Default is 3.

`trace`
: Should we print status information about the fitting? Default is 'FALSE'.

Value

a 'mars.control. object

Examples

```
mc <- mars.control(Mmax = 10)
```

Plot mars

Description

Plot mars

Usage

```
## S3 method for class 'mars'
plot(OBJECT, ...)
```

Arguments

`OBJECT`	a mars object
`...`	these are additional arguments for plotting mars object
`description`	plots the fitted basis function, made up of 1 to 2 hinge functions. Depends on main effects (1 exp variable) or two-way interactions (2 exp variables)

Author(s)

Tauseef Kashtwari, Promit Chowdhury, Ibraheem Azad

Examples

```
mm <- mars(y~x1+x2,data=marstestdata,mars.control(Mmax=4))
```

Predict method for MARS

Description

Predict with an mars model for new data, returns the predicted basis function.

Usage

```
predict.mars(object = (mars object), newdata = data)
```

Arguments

`object`
: An object of class mars

`newdata`
: A data frame to predict with

Author(s)

Tauseef Kashtwari, Promit Chowdhury, Ibraheem Azad

See Also

make_B_splits

Examples

```
mc = mars.control()
mm = mars(y ~ .,data=marstestdata,control=mc)
```

Prints out a mars object

Description

PRINT METHOD MARS OBJECT

Usage

```
## S3 method for class 'mars'
print(marsobject, ...)
```

Details

Prints intercept and coefficient of mars object

Value

values of the coefficients for MARS

Author(s)

Tauseef Kashtwari, Promit Chowdhury, Ibraheem Azad

Examples

```
mm <- mars(y~x1+x2,data=marstestdata)
print(mm)
```

summary.mars

Description

prints a summary of the mars object with the function call. Also prints the summary of the hinges of each basis function.

Usage

```
## S3 method for class 'mars'
summary(object, digits)
```

Arguments

`object`
: of class mars, which is obtained from calling mars()

`digits`
: the number of significant digits i.e. SIG FIG

Author(s)

Tauseef Kashtwari, Promit Chowdhury, Ibraheem Azad

Examples

```
mm<-mars(y ~.,data=mars::marstestdata)
summary(mm)
```