Package ‘clogitboost’

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Title Boosting Conditional Logit Model
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Description A set of functions to fit a boosting conditional logit model.
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Boosting conditional logit model

Description

Fit a boosting conditional logit model using componentwise smoothing spline.

Usage

clogitboost(y, x, strata, iter, rho)

Arguments

- **y**: vector of binary outcomes.
- **x**: matrix or data frame with each column being a covariate.
- **strata**: vector of group membership, i.e., items in the same group have the same value.
- **iter**: number of iterations.
- **rho**: learning rate parameter in the boosting algorithm.

Value

The function clogitboost returns the following list of values:

- **call**: original function call.
- **func**: list of fitted spline functions.
- **index**: list of indices indicating which covariate is used as input for the smoothing spline.
- **theta**: list of fitted coefficients in the conditional logit models.
- **loglike**: sequence of fitted values of log-likelihood.
- **infscore**: relative influence score for each covariate.
- **rho**: learning rate parameter, which typically takes a value of 0.05 or 0.1.
- **xmax**: maximal element of each covariate.
- **xmin**: minimal element of each covariate.

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See Also

- `plot.clogitboost`
- `predict.clogitboost`
marginal

Examples

data(travel)
train <- 1:504
y <- travel$MODE[train]
x <- travel[train, 3:6]
strata <- travel$Group[train]
fit <- clogitboost(y = y, x = x, strata = strata, iter = 10, rho = 0.05)
marginal(fit, grid = seq(0, 10, by = 1), d = 1)

Description

marginal function for the clogitboost objects, which produces the marginal utility values of a covariate.

Usage

marginal(x, grid, d)

Arguments

x output object from the clogitboost function.
d integer indicating which covariate is used.
grid grid of values for predicting the marginal utilities.

Value

The method marginal returns a vector of predicted marginal utilities based on the grid input.

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See Also

clogitboost

Examples

data(travel)
train <- 1:504
y <- travel$MODE[train]
x <- travel[train, 3:6]
strata <- travel$Group[train]
fit <- clogitboost(y = y, x = x, strata = strata, iter = 10, rho = 0.05)
marginal(fit, grid = seq(0, 10, by = 1), d = 1)
plot.clogitboost  Plotting after fitting a boosting conditional logit model

Description

plot methods for the clogitboost objects, which produce marginal plots of the covariate effects.

Usage

### S3 method for class 'clogitboost'
plot(x, d, grid = NULL, ...)

Arguments

- **x**: output object from the `clogitboost` function.
- **d**: integer indicating which covariate is used.
- **grid**: grid of values for plotting. If it is not specified, the minimal and maximal elements of the covariate are used as the two endpoints of the grid.
- **...**: other options for plotting.

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See Also

clogitboost

Examples

data(travel)
train <- 1:504
y <- travel$MODE[train]
x <- travel[train, 3:6]
strata <- travel$Group[train]
fit <- clogitboost(y = y, x = x, strata = strata, iter = 10, rho = 0.05)
plot(fit, d = 1, xlab = "x", ylab = "f(x)", main = "TIME", type = "l")
predict.clogitboost

Predicting after fitting a boosting conditional logit model

Description

predict methods for the clogitboost objects, which produce marginal predictions of the covariate effects.

Usage

## S3 method for class 'clogitboost'
predict(object, x, strata, ...)

Arguments

- **object**: output object from the `clogitboost` function.
- **x**: new matrix or data frame with each column being a covariate.
- **strata**: new vector of group memberships, i.e., items in the same group have the same value.
- **...**: not currently used.

Value

The method `predict` returns the following list of values:

- **prob**: probability of the outcome equal to 1.
- **utility**: predicted utility.
- **prediction**: 0-1 prediction of the outcome variable.

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See Also

clogitboost

Examples

data(travel)
train <- 1:504
y <- travel$MODE[train]
x <- travel[train, 3:6]
strata <- travel$Group[train]
fit <- clogitboost(y = y, x = x, strata = strata, iter = 10, rho = 0.05)
predict(fit, x = travel[-train, 3:6], strata = travel$Group[-train])
summary.clogitboost  Summary after fitting a boosting conditional logit model

Description

summary methods for the clogitboost objects.

Usage

```r
## S3 method for class 'clogitboost'
summary(object, ...)  
```

Arguments

- `object`: output object from the `clogitboost` function.
- `...`: not currently used.

Value

The function `clogitboost()` returns the following list of values:

- `call`: original function call.
- `inf_score`: relative influence score for each covariate.
- `loglike`: sequence of the fitted values of log-likelihood.

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See Also

clogitboost

Examples

data(travel)
train <- 1:504
y <- travel$MODE[train]
x <- travel[train, 3:6]
strata <- travel$Group[train]
fit <- clogitboost(y = y, x = x, strata = strata, iter = 10, rho = 0.05)
summary(fit)
Australian travel mode choice data

Description
The dataset is a survey result of 210 individuals’ choices of travel mode between Sydney, Melbourne and New South Wales. There are four alternative choices, along with four choice-specific covaraites for each choice.

Usage
data("travel")

Format
A data frame with 840 observations on the following 6 variables.

- Group  index of the group membership.
- MODE  binary outcome of whether the item is chosen.
- TTME  terminal time.
- INVC  in-vehicle cost.
- INVT  amount of time spent traveling.
- GC   generalized cost of travel.

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