Package ‘StepBeta’

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Type  Package
Title  Provide the Stepwise Procedure for Beta Regression Models
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Description  Starting from a Beta Regression Model, it provides a stepwise procedure to select the linear predictor.
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keep_formula_terms  StepBeta internal object

Description

StepBeta internal object
Usage

keep_formula_terms(the_formula, var_name)

Arguments

the_formula | Formula of Beta Regression model
var_name | Names of the variables to keep

Value

The function updates the formula, it keeps the variables defined by the user

remove_formula_interactions

StepBeta internal object

Description

StepBeta internal object

Usage

remove_formula_interactions(the_formula)

Arguments

the_formula | Formula of Beta Regression model

Value

The function returns a reduced form of the formula. It excludes the interactive effects.

StepBeta

Stepwise model selection for Beta Regression

Description

This function performs a stepwise algorithm to define the best linear predictor according to an user defined criterion (default is the Akaike Information Criterion aka AIC). It works for objects of class "betareg". If the object is different from "betareg" class, the function performs the classical "step" function in "stats" package.

Usage

StepBeta(object, k = 2)
Arguments
- `object`: Object of class "betareg". If the class is different, the function applies the step function in the "stats" package.
- `k`: The penalty parameter used for the criterion, e.g., default is `k = 2` which identifies the classical AIC. BIC can be obtained as `k = log(n)`.

Details
StepBeta is different from step (stats) and stepAIC (MASS) functions; for an object of class "betareg" is impossible to use an algorithm which uses the function extractAIC. Starting from a full model it provides a backaward procedure where the scope model is the reduced one.

First, StepBeta operates on all the principal effects included in the model; starting from the full model, the algorithm computes all the possible models, it calculates the measure (default is AIC) and it defines as a good predictor the model with lower AIC.

Then, based on the previous results, StepBeta operates adding all the possible interactive effects. As in the first passage, the model chosen by the algorithm is the one whose AIC is the lowest.

During the procedure, StepBeta considers all the possible models which betareg can fit. There are many cases where betareg function fails into error, in these cases the algorithm does not consider the linear predictor which causes the error and it goes forward.

Value
The algorithm returns an object of class "betareg".

Author(s)
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References

Examples
```r
## Starting from a "betareg" model

## Wadsworth & Brooks/Cole. (has iris3 as iris.)

## Prepare the data
library(betareg)
data <- iris
```
data$Sepal.Length <- data$Sepal.Length/(max(data$Sepal.Length) + 0.01)

fullModel <- betareg(Sepal.Length ~ Sepal.Width * Petal.Length * Petal.Width + Species, data = data)
reducedModel <- StepBeta(fullModel)
summary(reducedModel)
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