Package ‘lboxcox’

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Title Implementation of Logistic Box-Cox Regression
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Description Implements a logistic box-cox model. This model is fully described in Xing, L. et al. (2021) <doi:10.1002/cjs.11587>.
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| depress | Depression dataset |

Description

The depress data frame has 8,893 rows and 5 columns from the National Health and Nutrition Examination Survey (NHANES) 2009–2010.

Usage

depress

Format

Sample survey data

depression binary response variable indicating whether the participant has depression (=1) or not (=0)
m mercury a numeric vector giving the log-transformed total blood mercury in micro-grams per litre
age 0 of participant is female and 1 if they are male
gender age of the participant
weight a numeric vector giving the sampling-weight.

Source


lbc_train

Train a Logistic Box-Cox model

Description

Train the given formula using a Logistic Box-Cox model.

Usage

lbc_train(
  formula,
  weight_column_name,
  data,
  init = NULL,
  svy_lambda_vector = seq(0, 2, length = 100),
  num_cores = 1
)
**Arguments**

- **formula**
  a formula of the form $y \sim x + z_1 + z_2$ where $y$ is a binary response variable, $x$ is a continuous predictor variable, and $z_1, z_2, \ldots$ are covariates.

- **weight_column_name**
  the name of the column in 'data' containing the survey weights.

- **data**
  dataframe containing the dataset to train on.

- **init**
  initial estimates for the coefficients. If NULL the svyglm model will be used.

- **svy_lambda_vector**
  values of lambda used in training svyglm model. Best model is used for initial coefficient estimates. If init is not NULL this parameter is ignored.

- **num_cores**
  the number of cores used when finding the best svyglm model. If init is not NULL this parameter is ignored.

**Value**

object of class 'maxLik' from the 'maxLik' package. Contains the coefficient estimates that maximizes likelihood among other statistics.

**Note**

This is reliant on the following work:


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**LogLikeFun**

*Log Likelihood of Logistic Box-Cox*

**Description**

This function gives the log likelihood of the Box-Cox model. Main purpose is to be an input to the maxLik function.

**Usage**

LogLikeFun(bb, ixx, iyy, iw, iZZ)
Arguments

bb current values for the intercept and slope coefficients
ixx continuous predictor
iyy binary outcome
iw sample weight
iZZ covariates to be incorporated in the model

Value

the log likelihood estimate for the coefficients in ‘bb’

ScoreFun

Log Likelihood Gradient of Logistic Box-Cox

Description

This function gives the gradient of the log likelihood of the Box-Cox model. Main purpose is to be an input to the maxLik function.

Usage

ScoreFun(bb, ixx, iyy, iw, iZZ)

Arguments

bb initial values for the intercept and slope coefficients
ixx continuous predictor
iyy binary outcome
iw sample weight
iZZ covariates to be incorporated in the model

Value

the gradient of the log likelihood estimate for the coefficients in ‘bb’
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