Package ‘llbayesireg’

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```
Description


Details

Package to estimate an L-Logistic regression model with median and precision regression structures, diagnostics and HPD.

Package: llbayesireg
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Source

The L-Logistic distribution was introduced by Tadikamalla and Johnson (1982), which refer to this distribution as Logit-Logistic distribution. Here, we have a new parameterization of the Logit-Logistic with the median as a parameter.

References


Description

EDI data set is the Education Development Index (EDI), Elementary School and High School of the municipalities of Sergipe state of Brazil.
Usage

data("EDI")

Format

A data frame containing 75 observations on 2 variables.

**EDI**
The format is: num [1:75] 3.6 3.6 3.8 3.1 3.5 3.7 3.8 3 3.2 0 ...

**EDIHS**
The format is: num [1:75] 3.8 2.9 3 2.8 2.8 1.9 3 2.2 2.6 3.6 ...

Details

The quality of education is attributed by a statistical value to educational indicators. This value is assigned by the context economic and social development to which the schools are inserted, not only by the students’ performances. The systems educational use mainly of them for the monitoring of educational quality.

References


Examples

data(EDI)
## maybe str(EDI) ; plot(EDI) ...

### llbayesireg

*The L-Logistic Bayesian Regression*

Description

Function to estimate a L-Logistic regression model with median and precision regression structures.

Usage

llbayesireg(y, X, W, niter = 1000, chains = 1, burn = floor(niter/2), jump = 1)

Arguments

- **y** Object of class vector, with the response.
- **X** Object of class matrix, with the variables for modelling the meadian. The default is NULL.
- **W** Object of class matrix, with the variables for modelling the presision. The default is NULL.
- **niter** A positive integer specifying the number of iterations for each chain. The default is 1000.
chains A positive integer specifying the number of Markov chains. The default is 1.
burn A positive integer specifying the period sampling (known as the burn-in). The default is niter/2.
jump A positive integer specifying the period for saving samples. The default is 1.

Details
See https://cran.r-project.org/web/packages/llogistic/llogistic.pdf.

Value
Object of the class matrix, if the user does not provide arguments X and W, with:
object Object of "fitll".
betas Object of class matrix with the samples of regression coefficient related to median.
deltas Object of class matrix with the samples of regression coefficient related to precision parameter.
sample.m Object of class matrix with the samples of median.
sample.phi Object of class matrix with the samples of precision parameter.

Object of the class matrix, if the user provide arguments X and W, with:
object Object of "fitll".
betas Object of class matrix with the samples of regression coefficient related to median.
deltas Object of class matrix with the samples of regression coefficient related to precision parameter.
sample.m Object of class matrix with the samples of median.
sample.phi Object of class matrix with the samples of precision parameter.
pred Object of class matrix with predicte vaules.
q The number of columns of X.
d The number of columns of W.

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References


Examples

# Modelation the coefficient with generated data

library(llbayesireg)
library(llogistic)

# Number of elements to be generated

n=50

# Generated response

bin=2005
set.seed(bin)
y=rllogistic(n,0.5, 2)

fitll = llbayesireg(y, niter=100, jump=10)

m.hat=mean(fitll$sample.m); m.hat
phi.hat=mean(fitll$sample.phi); phi.hat

# Modelation the coefficient with real data

library(llbayesireg)

data("Votes","MHDI")

y = Votes[,4]
X = MHDI

fitll = llbayesireg(y,X)

summary(fitll$object, pars = c("beta","delta"), probs = c(0.025,0.975))

plot(fitll$betas[,1,1], type = "l")

lldiagnostics

Diagnosics from a fitll object

Description

Prints diagnostics or extract those diagnostics from a fitll object.
Usage

```
ll diagnostics(object)
```

Arguments

- `object`: Object of "fitll".

Details

The function calls the check_* functions and the get_* functions are for access to the diagnostics. If the matrix X and W are missing, the coda package is used by test the convergence of the chains by Cramer-von-Mises statistic and an image of the correlation is show for both of generated chains.

Value

`ll diagnostics(object)` prints diagnostics or extract those diagnostics from a fitll object.

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Source

The L-Logistic distribution was introduced by Tadikamalla and Johnson (1982), which refer to this distribution as Logit-Logistic distribution. Here, we have a new parameterization of the Logit-Logistic with the median as a parameter.

References


Examples

```
# Modelation the coeficient with generated data

library(llbayesireg)
library(llogistic)

# Number of elements to be generated

n=50

# Generated response

bin=2005
set.seed(bin)
```
```r
y = rlllogistic(n, 0.5, 2)
fitll = llbayesireg(y, niter=100, jump=10)
ldiagnostics(fitll$object)

# Model the coefficient with real data
library(llbayesireg)
data("Votes", "MHDI")
y = Votes[, 4]
X = MHDI
fitll = llbayesireg(y, X)
ldiagnostics(fitll$object)
```

---

**llHPD**  
*Highest Posterior Density for the L-Logistic Bayesian Regression*

**Description**
Compute the highest posterior density for the L-Logistic Bayesian Regression intervals of betas and deltas.

**Usage**
```
llHPD(fitll, prob = 0.95, chain = 1)
```

**Arguments**
- `fitll`: Object of class matrix with the `llbayesireg` function result.
- `prob`: A number of quantiles of interest. The default is 0.95.
- `chain`: Chain chosen for construction. The default is 1.

**Details**
This function compute the highest posterior density intervals for a Bayesian posterior distribution.

**Value**
Object of class matrix with:
- `betas`: The highest posterior density intervals of betas.
- `deltas`: The highest posterior density intervals of deltas.
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Source
The L-Losgistic distribution was introduced by Tadikamalla and Johnson (1982), which refer to this distribution as Logit-Logistic distribution. Here, we have a new parameterization of the Logit-Logistic with the median as a parameter.

References

Examples
# Modelation the coefficient with generated data
library(llbayesireg)
library(llogistic)

# Number of elements to be generated
n=50

# Generated response
bin=2005
set.seed(bin)
y=rlllogistic(n,0.5, 2)
fitll = llbayesireg(y, niter=100, jump=10)
llHPD(fitll)

# Modelation the coefficient with real data
library(llbayesireg)
data("Votes","MHDI")
y = Votes[,4]
X = MHDI
fitll = llbayesireg(y,X)
llHPD(fitll)
Description

MHDI data set is the Municipal Human Development Index (MHDI) of the municipalities of Sergipe state of Brazil.

Usage

data("MHDI")

Format

The format is: num [1:75] 0.611 0.578 0.77 0.595 0.579 0.649 0.604 0.54 0.621 0.569 ...

Details

The MHDI is a summary measure of long-term progress in three basic dimensions of human development that takes into account education, income and longevity indexes in municipalities. The MHDI data is the geometric mean of normalized indexes for each of the three dimensions of human development.

Source

PNUD, IPEA & FJP. (2013).

References


Examples

data(MHDI)
## maybe str(MHDI) ; plot(MHDI) ...
Description

Proportion of votes for a political party (Partido dos Trabalhadores) in presidential elections in Brazil by the different municipalities of Sergipe state.

Usage

data("Votes")

Format

A data frame containing 75 observations on 4 variables.

Votes1994  The format is: num [1:75] 0.228 0.172 0.431 0.105 0.165 ...
Votes1998  The format is: num [1:75] 0.293 0.193 0.427 0.111 0.155 ...
Votes2002  The format is: num [1:75] 0.307 0.278 0.517 0.268 0.223 ...
Votes2006  The format is: num [1:75] 0.492 0.365 0.375 0.426 0.368 ...

Details

Proportion of votes for a political party (Partido dos Trabalhadores) in presidential elections in Brazil by the different municipalities of Sergipe state in the years 1994, 1998, 2002 and 2006.

References


Examples

data(Votes)
## maybe str(Votes) ; plot(Votes) ...
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