# Package ‘Bayesianantreg’

December 14, 2023

**Type**  Package  
**Title**  Bayesian t Regression for Modeling Mean and Scale Parameters  
**License**  GPL (>= 2)  
**Version**  1.0.1  
**Date**  2022-01-18  
**Author**  Margarita Marin and Edilberto Cepeda-Cuervo.  
**Maintainer**  Margarita Marin <mmarinj@unal.edu.co>  
**Depends**  R (>= 4.1.0)  
**Imports**  MASS (>= 7.3), Matrix (>= 1.2), mvtnorm (>= 1.1)  
**Description**  Performs Bayesian t Regression where mean and scale parameters are modeling by linear regression structures, and the degrees of freedom parameters are estimated.  
**Encoding**  UTF-8  
**NeedsCompilation**  no  
**Repository**  CRAN  
**Date/Publication**  2023-12-14 16:06:20 UTC

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Bayesiantreg-package

Function to do Bayesian t Regression: joint mean and variance modeling and estimation of the degrees of freedom

Description

Bayesian t regression package

Details

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Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

Description

Function to do Bayesian t Regression: joint mean and variance modeling and estimation of the degrees of freedom
Usage

Bayesiantreg(y, x, z, nsim, bini, bpri, Bpri, gini, gpri, Gpri, glini, glpri,
type, apriori, propuesta, Maxi=NULL,
lambda = NULL, p = NULL, burn, jump, graph1 = TRUE, graph2 = TRUE,
graph3 = TRUE)

Arguments

y object of class matrix, with the dependent variable.
x object of class matrix, with the variables for modelling the mean.
z object of class matrix, with the variables for modelling the precision.
nsim a number that indicate the number of iterations.
bini a vector with the initial values of beta.
bpri a vector with the values of the mean of the prior of beta.
Bpri a matrix with the values of the variance of the prior of beta.
gini a vector with the initial values of gamma.
gpri a vector with the values of the mean of the prior of gamma.
Gpri a matrix with the values of the variance of the prior of gamma.
 glini a vector with the initial value of the degrees of freedom.
 glpri a vector with the value of the the prior of the degrees of freedom.
type a vector that can take the value "D" if the prior for the degrees of freedom con-
sidered as discrete or "C" if it is continuous.
apriori when type is "D", it is a vector that can take the values of "poi" for a Poisson
prior or "unif" for a uniform prior. When type is "C", it is a vector that can take
the values of "exp" for the exponential prior, "unif" for the uniform prior or "J2"
for the Jeffrey’s prior.
propuesta when type is "D", it is a vector that can take the values of "poi" for a Poisson
proposal, "unif" for a uniform proposal or by default the proposal made by Marin
and Cepeda (\). When type is "C", it is a vector that can take the values of
"exp" for the exponential proposal, "unif" for the uniform proposal, "J2" for the
Jeffrey’s proposal or by default the proposal made by Marin and Cepeda (\).
Maxi a number indicating the maximum value for the uniform prior an the uniforme
proposal.
lambda a number indicating the mean parameter value for the Poisson prior an the Pois-
son proposal.
p a number indicating the parameter value for the Jeffrey’s prior an the Jeffrey’s
proposal.
burn a proportion that indicate the number of iterations to be burn at the beginning of
the chain.
jump a number that indicate the distance between samples of the autocorrelated the
chain, to be excluded from the final chain.
graph1 if it is TRUE present the graph of the chains without jump and burn.
Bayesiantreg

graph2 if it is TRUE present the graph of the chains with jump and burn.
graph3 if it is TRUE present the graph of the standardized residuals, the the standardized residuals against the lineal predictor, the pseudo deviance residuals and the pseudo deviance residuals against the lineal predictor.

Details

The bayesian t regression allows the joint modelling of mean and variance and the estimation of the degrees of freedom of a t distributed variable, as is proposed in Marin and Cepeda (\_), with identical link for the mean and logarithmic for the variance, and different discrete and continuous approach for the degrees of freedom.

Value

object of class bayesbetareg with:

coefficients object of class matrix with the estimated coefficients of beta, gamma and degrees of freedom.
interv object of class matrix with the estimated confidence intervals of beta, gamma and the degrees of freedom.
fitted.values object of class matrix with the fitted values of y.
residuals object of class matrix with the residuals of the regression.
residualsstd object of class matrix with the standardized residuals of the regression.
residualsdev object of class matrix with the pseudo deviance residuals of the regression.
variance object of class matrix with the variance terms of the regression.
beta.mcmc object of class matrix with the complete chains for beta.
gamma.mcmc object of class matrix with the complete chains for gamma.
gl.mcmc object of class matrix with the complete chains for the degrees of freedom.
beta.mcmc.burn object of class matrix with the chains for beta after the burned process.
gamma.mcmc.burn object of class matrix with the chains for gamma after the burned process.

arb acceptance percentage for beta.
arg acceptance percentage for gamma.
argl acceptance percentage for the degrees of freedom.
call Call.
Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>


References

1. Marin and Cepeda-Cuervo (_). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

Examples

```r
n <- 10
X1 <- runif(n,0,10)
X2 <- runif(n,5,10)
X3 <- runif(n,10,15)

y1 <- c(0.09, 1.68, -2.43, 0.23, 2.94, 1.50, 3.40, 2.22, 0.28, -0.17)
betas <- c(0,0,0,0)
gammas <- c(0,0,0)
gl <- 3
x <- cbind(rep(1,n),X1,X2,X3)
z <- cbind(rep(1,n),X2,X3)
y <- y1
Bpri <- diag(rep(100,4))
bpri <- rep(0,4)
Gpri <- diag(rep(10,3))
gpri <- rep(0,3)
glpri <- 7
propuesta <- "unif2"
apriori <- "unif"
tipo <- "D"
Maxi <- 100
nsim <- 50

bini=bpri
gini=gpri
glini=glpri```

reg1 <- Bayesiantreg(y, x, z, nsim=nsim, bini, bpri,
Bpri, gini,
gpri,Gpri, glini, glpri,
type=tipo, apriori=apriori,
propuesta=propuesta,
Maxi=Maxi,burn=0.3, jump=3,
graph1 = TRUE, graph2 = TRUE, graph3 = TRUE)

BayesiantregEst  Bayesian t regression

Description

Function to do Bayesian t Regression: joint mean and variance modeling and estimation of the
degrees of freedom

Usage

BayesiantregEst(y, x, z, nsim, bini, bpri, Bpri, gini, gpri, Gpri, glini, glpri,
type, apriori, propuesta, Maxi=NULL,
lambda = NULL, p = NULL, burn, jump, graph1 = TRUE, graph2 = TRUE,
graph3 = TRUE)

Arguments

y  object of class matrix, with the dependent variable.
x  object of class matrix, with the variables for modelling the mean.
z  object of class matrix, with the variables for modelling the precision.
nsim a number that indicate the number of iterations.
bini a vector with the initial values of beta.
bpri a vector with the values of the mean of the prior of beta.
Bpri a matrix with the values of the variance of the prior of beta.
gini a vector with the initial values of gamma.
gpri a vector with the values of the mean of the prior of gamma.
Gpri a matrix with the values of the variance of the prior of gamma.
 glini a vector with the initial value of the degrees of freedom.
 glpri a vector with the value of the the prior of the degrees of freedom.
type a vector that can take the value "D" if the prior for the degrees of freedom con-
considered as discrete or "C" if it is continuous.
apriori when type is "D", it is a vector that can take the values of "poi" for a Poisson
prior or "unif" for a uniform prior. When type is "C", it is a vector that can take
the values of "exp" for the exponential prior, "unif" for the uniform prior or "J2"
for the Jeffrey’s prior.
propuesta when type is "D", it is a vector that can take the values of "poi" for a Poisson proposal, "unif" for a uniform proposal or by default the proposal made by Marin and Cepeda (_). When type is "C", it is a vector that can take the values of "exp" for the exponential proposal, "unif" for the uniform proposal, "J2" for the Jeffrey’s proposal or by default the proposal made by Marin and Cepeda (_).

Maxi a number indicating the maximum value for the uniform prior an the uniforme proposal.

lambda a number indicating the mean parameter value for the Poisson prior an the Poisson proposal.

p a number indicating the parameter value for the Jeffrey’s prior an the Jeffrey’s proposal.

burn a proportion that indicate the number of iterations to be burn at the beginning of the chain.

jump a number that indicate the distance between samples of the autocorrelated the chain, to be excluded from the final chain.

graph1 if it is TRUE present the graph of the chains without jump and burn.

graph2 if it is TRUE present the graph of the chains with jump and burn.

graph3 if it is TRUE present the graph of the standardized residuals, the the standardized residuals against the lineal predictor, the pseudo deviance residuals and the pseudo deviance residuals against the lineal predictor.

Details

The bayesian t regression allows the joint modelling of mean and variance and the estimation of the degrees of freedom of a t distributed variable, as is proposed in Marin and Cepeda (_), with identical link for the mean and logarithmic for the variance, and different discrete and continuous aproach for the degrees of freedom.

Value

object of class bayesbetareg with:

coefficients object of class matrix with the estimated coefficients of beta, gamma and degrees of freedom.

interv object of class matrix with the estimated confidence intervals of beta, gamma and the degrees of freedom.

fitted.values object of class matrix with the fitted values of y.

residuals object of class matrix with the residuals of the regression.

residualsstd object of class matrix with the standardized residuals of the regression.

residualsdev object of class matrix with the pseudo deviance residuals of the regression.

variance object of class matrix with the variance terms of the regression.

beta.mcmc object of class matrix with the complete chains for beta.

gamma.mcmc object of class matrix with the complete chains for gamma.

gl.mcmc object of class matrix with the complete chains for the degrees of freedom.
beta.mcmc.burn  object of class matrix with the chains for beta after the burned process.
gamma.mcmc.burn object of class matrix with the chains for gamma after the burned process.
gl.mcmc.burn    object of class matrix with the chains for the degrees of freedom after the burned process.
AIC            AIC of the model.
BIC            BIC of the model.
DIC            BIC of the model.
PseudoDeviance  a Pseudo Deviance criteria of the model as is proposed in Marin and Cepeda (__).

Author(s)
Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

References
1. Marin and Cepeda-Cuervo (__). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

Examples

```r
#library(heavy)
#data(ereturns)

# y <- ereturns[,3]
# x <- cbind(rep(1,nrow(ereturns)),ereturns[,4])
# z <- x

## A priori para Beta
#Bpri <- diag(rep(100,2))
#bpri <- rep(0,2)

## A priori para Gamma
#Gpri <- diag(rep(10,2))
#gpri <- rep(0,2)

##otros parametros
#glpri <- 7

#propuesta <- "unif2"
apriori <- "unif"
type <- "D"
lambda <- 0.1
```
criteria

Performs the comparison criterias for the Bayesian t Regression

criteria(object,...)

Arguments

object object of class "Bayesianreg"

...

Details

This function allows to extract the information criteria from the model AIC, BIC, DIC and pseudo-deviance.

Value

loglik the logarithmic of the likelihood of the model
AIC the AIC criteria
BIC the BIC criteria
DIC the DIC criteria
PseudoDeviance the pseudo deviance criteria of the model as is proposed in Marin and Cepeda (_).
Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>,

References

1. Marin and Cepeda-Cuervo (_). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


devero

Description

Calculate the loglikelihood for every point of the t model

Usage

devero(y, mu, sigma2, grados)

Arguments

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>object of class matrix, with the dependent variables.</td>
</tr>
<tr>
<td>mu</td>
<td>object of class matrix, with the mean of the model.</td>
</tr>
<tr>
<td>sigma2</td>
<td>object of class matrix, with the variance of the model.</td>
</tr>
<tr>
<td>grados</td>
<td>a vector with the degrees of freedom of the model.</td>
</tr>
</tbody>
</table>

Details

Calculate the loglikelihood for the t model as proposed by Marin and Cepeda (_).

Value

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>a value with the loglikelihood for the t model</td>
</tr>
</tbody>
</table>

Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>
dJ2  

References

1. Marin and Cepeda-Cuervo ( ). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


---

dJ2  

*density of the Jeffreys’s distribution*

Description

calculates the density of the Jeffreys’s distribution

Usage

dJ2(gl.ini, p)

Arguments

gl.ini a vector with the number to evaluate in the density.
p a number indicating the parameter value for the Jeffreys’s prior an the Jeffreys’s proposal

Details

Calculates the density of the Jeffreys’s distribution

Value

J1 the value of the density

Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>
**dpostb**

*Posterior value of beta*

**Description**

Calculate a value for posterior density for beta parameter

**Usage**

```
dpostb(y, x, z, betas, gammas, gl, bpri, Bpri)
```

**Arguments**

- `y`: object of class matrix, with the dependen variables.
- `x`: object of class matrix, with the variables for modelling the mean.
- `z`: object of class matrix, with the variables for modelling the variance.
- `betas`: a vector with the proposal beta parameters.
- `gammas`: a vector with the proposal gamma parameters.
- `gl`: a vector with the proposal degrees of freedom parameters.
- `bpri`: a vector with the values of the mean of the prior of beta.
- `Bpri`: a matrix with the values of the variance of the prior of beta.

**Details**

Generate the posterior density for the beta proposed by Marin and Cepeda (\_).

**Value**

- value: a value with the posterior density for beta

**Author(s)**

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

**References**

1. Marin and Cepeda-Cuervo (\_). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished
**dpostg**

**Posterior density of gamma**

---

**Description**

Propose a value for posterior density of the gamma parameter.

**Usage**

\[\text{dpostg}(y, x, z, \text{betas}, \text{gammas}, \text{gl}, \text{gpri}, \text{Gpri})\]

**Arguments**

- **y**: object of class matrix, with the dependent variables.
- **x**: object of class matrix, with the variables for modelling the mean.
- **z**: object of class matrix, with the variables for modelling the variance.
- **betas**: a vector with the proposal beta parameters.
- **gammas**: a vector with the proposal gamma parameters.
- **gl**: a vector with the proposal degrees of freedom parameter.
- **gpri**: a vector with the values of the mean of the prior of gamma.
- **Gpri**: a matrix with the values of the variance of the prior of gamma.

**Details**

Generate the posterior density for the gamma proposed by Marin and Cepeda (\_).

**Value**

value a value with the posterior density for gamma

**Author(s)**

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

**References**

1. Marin and Cepeda-Cuervo (\_). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished
**gammakernel**

the probability of a gamma parameter from the probability density function defined by old parameters.

**Description**

evaluate the probability of a gamma parameter from the probability density function defined by old parameters.

**Usage**

gammakernel(y, x, z, betas.ini, gammas.now, gammas.old, gl.ini, gpri, Gpri)

**Arguments**

<table>
<thead>
<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>object of class matrix, with the dependent variable</td>
</tr>
<tr>
<td>x</td>
<td>object of class matrix, with the variables for modelling the mean</td>
</tr>
<tr>
<td>z</td>
<td>object of class matrix, with the variables for modelling the variance</td>
</tr>
<tr>
<td>betas.ini</td>
<td>a vector with the beta parameters that define the old p.d.f</td>
</tr>
<tr>
<td>gammas.now</td>
<td>a vector with the gamma parameters - new parameters - to evaluate in the old</td>
</tr>
<tr>
<td></td>
<td>p.d.f</td>
</tr>
<tr>
<td>gammas.old</td>
<td>a vector with the gamma parameters that define the old p.d.f</td>
</tr>
<tr>
<td>gl.ini</td>
<td>a vector with the degrees of freedom parameters that define the old p.d.f</td>
</tr>
<tr>
<td>gpri</td>
<td>a vector with the initial values of gamma</td>
</tr>
<tr>
<td>Gpri</td>
<td>a matrix with the initial values of the variance of gamma</td>
</tr>
</tbody>
</table>

**Details**

Evaluate the probability of a gamma parameter from the probability density function defined by old parameters, according with the model proposed by Marin and Cepeda-Cuervo (___).

**Value**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>value</td>
<td>a vector with the probability for the gamma parameter from the probability density function defined by old parameters.</td>
</tr>
</tbody>
</table>

**Author(s)**

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>
References

1. Marin and Cepeda-Cuervo (._). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


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gammaproposal

A proposal for gamma parameters

Description

Propose a value for the gamma parameters

Usage

gammaproposal(y, x, z, betas.ini, gammas.ini, gl.ini, gpri, Gpri)

Arguments

- **y**: object of class matrix, with the dependent variable
- **x**: object of class matrix, with the variables for modelling the mean
- **z**: object of class matrix, with the variables for modelling the variance
- **betas.ini**: a vector with the previous proposal beta parameters
- **gammas.ini**: a vector with the previous proposal gamma parameters
- **gl.ini**: a vector with the previous proposal degrees of freedom parameter
- **gpri**: a vector with the values of the mean of the prior of gamma.
- **Gpri**: a matrix with the values of the variance of the prior of gamma.

Details

Generate a proposal for the gamma parameters according to the model proposed by Marin and Cepeda-Cuervo (._).

Value

- **gammas.pro**: a number with the proposal for the gamma parameters.

Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>
References

1. Marin and Cepeda-Cuervo (._). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


---

**glpost**

*Posterior value of the degrees of freedom*

**Description**

Calculate a value for posterior density of the degrees of freedom parameter

**Usage**

\[
glpost(y, x, z, betas.ini, gammas.ini, gl.ini, Maxi, lambda, p, prior, type)
\]

**Arguments**

- `y` object of class matrix, with the dependent variables.
- `x` object of class matrix, with the variables for modelling the mean.
- `z` object of class matrix, with the variables for modelling the variance.
- `betas.ini` a vector with the proposal beta parameters.
- `gammas.ini` a vector with the proposal gamma parameters.
- `gl.ini` a vector with the proposal degrees of freedom parameter.
- `Maxi` a number indicating the maximum value for the uniform prior an the uniforme proposal
- `lambda` a number indicating the mean parameter value for the Poisson prior an the Poisson proposal
- `p` a number indicating the parameter value for the Jeffrey’s prior an the Jeffrey’s proposal
- `type` a vector that can take the value "D" if the prior for the degrees of freedom considered as discrete or "C" if it is continuous.
- `prior` when type is "D", it is a vector that can take the values of "poi" for a Poisson prior or "unif" for a uniform prior. When type is "C", it is a vector that can take the values of "exp" for the exponential prior, "unif" for the uniform prior or "J2" for the Jeffrey’s prior.

**Details**

Generate the posterior density for the degrees of freedom proposed by Marin and Cepeda (._).
Value

value a value with the posterior density for the degrees of freedom

Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

References

1. Marin and Cepeda-Cuervo ( ). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

---

**glproposal**

* A proposal for degrees of freedom parameter

**Description**

Propose a value for the degrees of freedom parameter

**Usage**

`glproposal(gl.ini, lambda, p, Maxi, matriz, propuesta, type)`

**Arguments**

- **gl.ini** a vector with the previous proposal degrees of freedom parameter
- **lambda** a number indicating the mean parameter value for the Poisson prior and the Poisson proposal.
- **p** a number indicating the parameter value for the Jeffrey’s prior and the Jeffrey’s proposal.
- **Maxi** a number indicating the maximum value for the uniform prior and the uniform proposal.
- **matriz** a matrix generated by the function `tabla` of the `bayesiantreg` package.
- **propuesta** when type is "D", it is a vector that can take the values of "poi" for a Poisson proposal, "unif" for a uniform proposal or by default the proposal made by Marin and Cepeda ( ). When type is "C", it is a vector that can take the values of "exp" for the exponential proposal, "unif" for the uniform proposal, "J2" for the Jeffrey’s proposal or by default the proposal made by Marin and Cepeda ( ).
- **type** a vector that can take the value "D" if the prior for the degrees of freedom considered as discrete or "C" if it is continuous.
Details

Generate a proposal for the gamma parameter according to the model proposed by Marin and Cepeda-Cuervo ( ).

Value

`gl.pro` a number with the proposal for the degrees of freedom parameter.

Author(s)

Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

References

1. Marin and Cepeda-Cuervo ( ). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

**mukernel**

*the probability of a beta parameter from the probability density function defined by old parameters*

Description

evaluate the probability of a beta parameter from the probability density function defined by old parameters

Usage

`mukernel(y, x, z, betas.now, betas.old, gammas.ini, gl.ini, bpri, Bpri)`

Arguments

- `y` object of class matrix, with the dependent variable
- `x` object of class matrix, with the variables for modelling the mean
- `z` object of class matrix, with the variables for modelling the variance
- `betas.now` a vector with the beta parameters - new parameters - to evaluate in the old p.d.f
- `betas.old` a vector with the beta parameters that define the old p.d.f
- `gammas.ini` a vector with the gammas parameters that define the old p.d.f
- `gl.ini` a vector with the degrees of freedom parameter that define the old p.d.f
- `bpri` a vector with the initial values of beta
- `Bpri` a matrix with the initial values of the variance of beta
Details
Evaluate the probability of a beta parameter from the probability density function defined by old parameters, according with the model proposed by Cepeda(2001) and Cepeda and Gamerman(2005).

Value
value a matrix with the probability for the beta parameter from the probability density function defined by old parameters

Author(s)
Margarita Marin <mmarinj@unal.edu.co>, Edilberto Cepeda-Cuervo <ecepedac@unal.edu.co>

References
1. Marin and Cepeda-Cuervo ( ). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

muproposal A proposal for beta parameter

Description
Propose a value for the beta parameter

Usage
muproposal(y, x, z, betas.ini, gammas.ini, gl.ini, bpri, Bpri)

Arguments
y object of class matrix, with the dependent variable
x object of class matrix, with the variables for modelling the mean
z object of class matrix, with the variables for modelling the variance
betas.ini a vector with the previous proposal beta parameters
gammas.ini a vector with the previous proposal gamma parameters
gl.ini a vector with the previous proposal degrees of freedom parameter
bpri a vector with the values of the mean of the prior of beta.
Bpri a matrix with the values of the variance of the prior of beta.
Details

Generate a proposal for the beta parameters according to the model proposed by Marin and Cepeda-Cuervo (_). 

Value

betas.pro a number with the proposal for the beta parameters.

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References

1. Marin and Cepeda-Cuervo (_). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

pJ2 density of the Jeffrey’s distribution

description

calculates the probability of the Jeffrey’s distribution

Usage

pJ2(gl.ini, p)

Arguments

$gl.ini a vector with the number to evaluate in the density.$

$p a number indicating the parameter value for the Jeffrey’s prior an the Jeffrey’s proposal$

Details

Calculates the probability of the Jeffrey’s distribution

Value

$J1I the value of the probability$
Author(s)

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Description

Print the summary Bayesian t Regression: joint mean and variance modeling and estimation of the degrees of freedom.

Usage

```r
## S3 method for class 'summary.Bayesianreg'
print(x, ...)
```

Arguments

- `x`: object of class Bayesianreg
- `...`: not used.

Value

Print the summary Bayesian t Regression: joint mean and variance modeling and estimation of the degrees of freedom.

Author(s)

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References

1. Marin and Cepeda-Cuervo ( ). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


rJ2

*random number from the Jeffrey’s distribution*

**Description**

generates random numbers from the Jeffrey’s distribution

**Usage**

```r
rJ2(n, matriz, min, max)
```

**Arguments**

- `n`: a number that indicates the number of random values that will be generated from the Jeffrey’s distribution.
- `matriz`: a matrix generated by the function `tabla` of the `bayesiantreg` package.
- `min`: a number indicating the minimum number that can be generated from the Jeffrey’s distribution.
- `max`: a number indicating the maximum number that can be generated from the Jeffrey’s distribution.

**Details**

generates random numbers from the Jeffrey’s distribution

**Value**

- `grados`: the random number

**Author(s)**

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---

**summary.Bayesiantreg**

*summary of the Bayesian t regression*

**Description**

Summarized the Bayesian Bayesian t Regression: joint mean and variance modeling and estimation of the degrees of freedom

**Usage**

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

Arguments

object  an object of class Bayesiantreg
...   not used.

Value

call  Call
coefficients  Coefficients.
AIC  AIC of the model.
BIC  BIC of the model.
DIC  BIC of the model.
PseudoDeviance  Pseudo deviance criteria of the model as is proposed by Marin and Cepeda (1).

Author(s)

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References

1. Marin and Cepeda-Cuervo (1). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished

tabla  

probabilities and numbers from the Jeffrey’s distribution

description

generates a table with diferente probabilities and associated numbers from the Jeffrey’s distribution

Usage

tabla(min, max, p)

Arguments

min  a number indicatein the minimum number that can be generated from the Jeffrey’s distribution.
max  a number indicatein the maximum number that can be generated from the Jeffrey’s distribution.
p  a number indicating the parameter value for the Jeffrey’s prior an the Jeffrey’s proposal.
Details

generates a table with diferente probabilities and associated numbers from the Jeffrey’s distribution

Value

matriz a matrix with the generated probabilities and associated numbers from the Jeffrey’s distribution

Author(s)

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Description

Calculate the loglikelihood for the t model

Usage

vero(y, mu, sigma2, grados)

Arguments

y object of class matrix, with the dependent variables.
mu object of class matrix, with the mean of the model.
sigma2 object of class matrix, with the variance of the model.
grados a vector with the degrees of freedom of the model.

Details

Calculate the loglikelihood for the t model as proposed by Marin and Cepeda (\_).

Value

1 a value with the loglikelihood for the t model

Author(s)

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References

1. Marin and Cepeda-Cuervo (,). A Bayesian regression model for the non-standardized t distribution with location, scale and degrees of freedom parameters. Unpublished


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