

Package ‘CensRegMod’

February 19, 2015

Type Package

Title Fits Normal and Student-t Censored Regression Model

Version 1.0

Date 2015-01-24

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Description Fits univariate censored linear regression model under Normal or Student-t distribution

Depends R (>= 3.1.2)

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License GPL (>= 3.0)

NeedsCompilation no

Repository CRAN

Date/Publication 2015-01-24 23:54:30

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em.cens	<i>Fits Univariate Censored Linear Regression Model With Normal or Student-t Errors</i>
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Description

Returns EM estimates for right censored regression model (under Normal or Student-t distribution) and calculates some diagnostic measures for detecting influential observations

Usage

```
em.cens(cc, x, y, nu="NULL", dist="Normal", diagnostic="FALSE", typediag="NULL")
```

Arguments

cc	Vector of censoring indicators. For each observation: 0 if non-censored, 1 if censored
x	Design matrix
y	Vector with the response variable
nu	Initial value for the degree of freedom in case of Student-t model (greater than 2)
dist	Distribution to be used for the errors. "Normal", for normal or "T" for Student-t
diagnostic	TRUE or FALSE. Indicates if any diagnostic measure should or not be computed
typediag	If diagnostic=TRUE, typediag indicates which diagnostic measure should be computed. If typediag=1, computes generalized Cook distance (GD) and its decomposition into the generalized Cook distance for the parameter subsets: betas (GDbeta) and sigma2 (GDsigma2). For local influence with case-weight perturbation, set typediag=2. For local influence with scale perturbation, set typediag=3

Details

Despite of this function has been built to deal with right censored response variables, one can easily adapt it to work with left censored responses: set -y and -x to obtain the left censored model fit and any diagnostic measure for it. The specification of the initial value for nu must be made carefully: if the data have many outliers, then you must choose a small value for nu (greater but near to 2), otherwise you can choose a greater value

Value

beta	EM estimatives for regression coefficients
sigma2	EM estimative for the error variance
nu	EM estimative for degree of freedom. Only returned when type="T"
logver	Value of the log-likelihood under the fitted model
SE	Standard error for EM estimators
measure	Vector with the diagnostic measure chosen in typediag. Only returned when diagnostic=TRUE
AIC	AIC model selection criteria
BIC	BIC model selection criteria
EDC	EDC model selection criteria

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References

Monique B. Massuia, Celso R. Cabral, Larissa A. Matos, Victor H. Lachos. "Influence Diagnostics for Student-t Censored Linear Regression Models"

Examples

```
##see examples in \code{\link{wage.rates}}
```

wage.rates	<i>Wage Rates of 753 Women</i>
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Description

Wage rates of 753 married white women with left censoring

Usage

```
data(wage.rates)
```

Format

A data frame with 753 observed wage rates of married white women in 1975. Some wage rates are set equal to zero, this means that those wives did not work in 1975, therefore, these observations are considered left censored at zero

Source

Mroz, T.A. 1987. "The sensitivity of an empirical model of married women's hours of work to economic and statistical assumptions". Full data set is available at

Examples

```
##Load the data
data(wage.rates)

##Setting y, x and cc
y <- wage.rates$wage
x <- cbind(1,wage.rates$age,wage.rates$educ,wage.rates$kidslt6,wage.rates$kidsge6)
cc<- (wage.rates$inlf==0)+0
p <- ncol(x)
n <- nrow(x)

## Fits a left censored Normal model and calculates Generalized Cook Distance
Normal <- em.cens(cc,-x,-y,dist="Normal",diagnostic=TRUE,typediag=1)

#Graphics the diagnostic measures
GD <- Normal$measure$GD
plot(GD,main="Generalized Cook Distance")
abline(h=2*(p+1)/n,col="red",lty=2)
```

```
GDbeta <- Normal$measure$GDbeta
plot(GDbeta, main="Generalized Cook Distance - Influence in Beta")
abline(h=2*p/n,col="red",lty=2)

GDsigma2 <- Normal$measure$GDsigma2
plot(GDsigma2,main="Generalized Cook Distance - Influence in Sigma2")
abline(h=2/n,col="red",lty=2)

## Fits a left censored Student-t model, does not calculate any diagnostic measures
T <- em.cens(cc,-x,-y,nu=5,dist="T")
```

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