Package 'DLASSO'

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Type Package

Title Implementation of Adaptive or Non-Adaptive Differentiable Lasso
    and SCAD Penalties in Linear Models

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Description An implementation of the differentiable lasso (dlasso) and SCAD (dSCAD) using itera-
    tive ridge algorithm. This package allows selecting the tuning parame-
    ter by AIC, BIC, GIC and GIC.

Depends R (>= 2.0)

License GPL (>= 2)

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NeedsCompilation no

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Imports MASS

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R topics documented:

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coef.dlasso   *Extract coefficients from a fitted dlasso model*

Description

While dlasso() produces the entire path of solutions, coef.dlasso extracts a particular point along the path corresponded to the minimum AIC, BIC, GIC or GCV.

Usage

```
## S3 method for class 'dlasso'
coef(object , ...)
```

Arguments

object   dlasso object.

...   Not working.

Value

A matrix of extracted coefficients.

Author(s)

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See Also

[dlasso](),[plot.dlasso]()

Examples

```
example(dlasso)
```

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dlasso   *An implementation of dlasso using iterative ridge algorithm*

Description

This function allows implementing differentiable lasso (dlasso) for arbitrary values of λ and s.

Usage

```
dlasso (x,
        y,
        s  =  1              ,
        intercept = FALSE  ,
        c  = 1               ,
        adp = TRUE           ,
        lambda = NULL        ,
        split  = 50          ,
        maxIter = 500        ,
        adj = 1.1            ,
        lowlambda = 10^-3    ,
        digit = 5            ,
        cauchy = FALSE       ,
        force = 'auto'       ,
        trace = FALSE)
```

Arguments

x	Matrix of predictors
y	Response vector
s	A single or a vector of precision value, s, given adp=FALSE. Default is 1. See "adp" parameter.
intercept	Logical flag. If TRUE, an intercept is included in the model, otherwise no intercept is included. Default is FALSE.
c	Choose between dlasso (c=1) and dSCAD (c=-1). Default is dlasso. See futher "force" parameter.
adp	Logical flag. TRUE to use adaptive adjustment for s. If TRUE then the function ignores the initial s.
lambda	Optional values for the tuning parameter. A single value or a sequence of values. Useful for manually searching over user defined set of tuning values. Set to any negative value to activate the automatic setting for $\lambda.max$ and $\lambda.min$.
split	The number of splits between $\lambda.min$ and $\lambda.max$.
maxIter	The maximum iterations for the algorithm. Default is 500.
adj	Positive value. This value adjusts the upper value for the penalty term, $adj * \lambda.max$.
lowlambda	The lower limit for the tuning parameter. Default is 10^-3.
digit	The maximum number of digits before setting an estimation to zero. The default is 5 digits.
cauchy	Logical flag. Set to TRUE to use Cauchy CDF instead of Gaussian one in the penalty function. The default is Gaussian.
force	Logical flag. Set to TRUE to let only a decrease in absolute estimation of the parameters. Default is 'auto' that is only applied if sqrt(n)>2*log(p) for n the number of observations and p the number of parameters.
trace	Logical flag. If TRUE, output contains some information about the steps. Default is FALSE.

Value

A "dlasso" object of the form of a matrix (λ | s | AICc | GIC | BIC | GCV | estimations).

Author(s)

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See Also

coef.dlasso,plot.dlasso

Examples

```
# dLASSO
r = 5
zr= 95
n = 50
b = c(1:r,rep(0,zr))
x = matrix(rnorm((r+zr)*n),ncol=r+zr)
y = x %*% b +rnorm(n)
dLasso = dlasso(x=x,y=y,adp=TRUE)
plot(dLasso,label=.1,cex=.80,all = 1)
coef(dLasso)
# dSCAD
dscad = dlasso(x=x,y=y,c=-1,adj=50)
plot(dscad,label=.1,cex=.80,all = 1)
coef(dscad)
```

---

plot.dlasso   *Plot method for dlasso objects*

Description

Produce a plot from a dlasso fit.

Usage

```
## S3 method for class 'dlasso'
plot(x, label=FALSE , cex.lab=1 , all=TRUE ,...)
```

Arguments

x	dlasso object
label	Show covariate labels on the right hand side of the plot.
cex.lab	See "cex.lab" in "par" function.

all	Logical flag. If TRUE shows all plots including AIC, GIC, BIC, CGV and complete coefficient path. Otherwise the output is a single plot for coefficient path. Default is TRUE.
...	Additional arguments for generic plot.

Author(s)

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See Also

dlasso,coef.dlasso

Examples

```
example(dlasso)
```

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