Package 'sealasso'

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Title Standard Error Adjusted Adaptive Lasso

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Depends R (>= 2.9.1), lars

Description Standard error adjusted adaptive lasso (SEA-lasso) is a version of the adaptive lasso, which incorporates OLS standard error to the L1 penalty weight. This method is intended for variable selection under linear regression settings (n > p). This new weight assignment strategy is especially useful when the collinearity of the design matrix is a concern.

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NeedsCompilation no

Repository CRAN

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sealasso *Standard Error Adjusted Adaptive Lasso*

Description

This provides the solution path of some variants of the adaptive lasso (e.g. SEA-lasso, NSEA-lasso, OLS-adaptive lasso), and the corresponding optimal model selected by BIC criterion.

Usage

```
sealasso(x, y, method = c("nsealasso", "sealasso", "olsalasso", "lasso"))
```

Arguments

x   The model matrix.

y   The response.

method   One of "nsealasso", "sealasso", "olsalasso" and "lasso", which represent NSEA-lasso, SEA-lasso, OLS-adaptive lasso and the lasso, respectively. The default is "nsealasso".

Details

SEA-lasso and NSEA-lasso (Qian and Yang, 2010) are two versions of the adaptive lasso. They may be used for variable selection, especially in cases where condition index of the scaled model matrix is large (e.g. > 10) and collinearity is a concern. This function provides condition index, solution path and the suggested optimal model based on BIC. The estimated coefficients are also given for transition points of the path.

Value

method   The method used.
condition.index
                Condition index of the scaled model matrix.

path   Solution path and corresponding BIC values at transition points.

beta   The estimated coefficients at transition points of solution path.

optim.beta   The estimated coefficients of the optimal model based on BIC criterion.

References

Qian, W. and Yang, Y. (2010) "Model Selection via Standard Error Adjusted Adaptive Lasso." Technical Report, University of Minnesota.

Examples

```
# use the diabetes dataset from "lars" package
data(diabetes)
x <- diabetes$x
y <- diabetes$y
sealasso(x, y)

# with quadratic terms
x2 <- cbind(diabetes$x1,diabetes$x2)
object <- sealasso(x2, y, "sealasso")
object$condition.index
object$optim.beta
```

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summary.sealasso   *Summary method for sealasso objects*

Description

This provides the method used, condition index and the optimal model selected by BIC.

Usage

```
## S3 method for class 'sealasso'
summary(object, ...)
```

Arguments

object   a sealasso object

...   other arguments to be passed to `summary`

Details

A summary is provided for a sealasso object. To provide a more succinct output, only the method used, condition index and the selected optimal model are printed out.

Value

method   The method used. One of NSEA-lasso, SEA-lasso, OLS-adaptive lasso and Lasso.

condition.index

       Condition index of the scaled model matrix.

optim.beta   The estimated coefficients of the optimal model based on BIC criterion.

References

Qian, W. and Yang, Y. (2010) "Model Selection via Standard Error Adjusted Adaptive Lasso." Technical Report, University of Minnesota.

See Also

sealasso

Examples

```
# use the diabetes dataset from "lars" package
data(diabetes)
y <- diabetes$y
# with quadratic terms
x2 <- cbind(diabetes$x1,diabetes$x2)
object <- sealasso(x2, y, "sealasso")
summary(object)
```

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