Package 'pros'

December 4, 2018

Title Penalized Regression on Steroids

Version 0.1

Author Austin David Brown <brow5079@umn.edu>

Maintainer Austin David Brown <brow5079@umn.edu>

Description This is a project for STAT8053 at the University of Minnesota.

Depends R (>= 3.5.1)

License Licensed under the Apache-2 (https://www.apache.org/licenses/LICENSE-2.0) license.

Encoding UTF-8

LazyData true

RoxygenNote 6.1.1

R topics documented:

---

cv.pros	*Cross-validation*

Description

The K-fold cross-validation function.

Usage

```
cv.pros(X, y, K_fold = 5, alpha = c(1, 0, 0, 0, 0, 0, 0),
  lambdas = seq(10^(-7), 1, 0.1), algorithm = "proximal_gradient_cd",
  max_iter = 10000, tolerance = 10^(-3))
```

Arguments

X	the matrix of the data
y	the vector of response values
alpha	the convex combination of length 7 corresponding to the penalties:

- l1 penalty
- l2 penalty
- l4 penalty
- l6 penalty
- l8 penalty
- l10 penalty

lambdas	A vector of dual penalization values to be evaluated
algorithm	the optimization algorithm

- proximal_gradient_cd
- subgradient_cd

max_iter	maximum iterations. This also tunes the step size.
tolerance	tolerance

Value

A class cv_pros

Examples

```
cv = cv.pros(X_train, y_train)
pred = predict(cv, X_test)
```

---

predict.cv_pros	*Cross-validation Prediction*

Description

The cross-validation prediction function.

Usage

```
## S3 method for class 'cv_pros'
predict(cv_prosObj, X_new)
```

Arguments

cv_prosObj	an object of class cv_pros
X_new	the matrix of the data to predict

Value

A vector of prediction values.

Examples

```
cv = cv.pros(X_train, y_train)
pred = predict(cv, X_test)
```

---

predict.pros	*Pros Prediction*

Description

The prediction function.

Usage

```
## S3 method for class 'pros'
predict(prosObj, X)
```

Arguments

prosObj   an object of class pros

X   the matrix of the data to predict

Value

A vector of prediction values.

Examples

```
fit = pros(X_train, y_train, lambda = .1)
pred = predict(fit, X_test)
```

---

pros	*Pros*

Description

The fit function for a specific lambda value.

Usage

```
pros(X, y, alpha = c(1, 0, 0, 0, 0, 0, 0), lambda,
  algorithm = "proximal_gradient_cd", max_iter = 10000,
  tolerance = 10^(-3))
```

Arguments

X	the matrix of the data
y	the vector of response values
alpha	the convex combination of length 7 corresponding to the penalties:

- l1 penalty
- l2 penalty
- l4 penalty
- l6 penalty
- l8 penalty
- l10 penalty

lambda	the dual penalization value
algorithm	the optimization algorithm

- proximal_gradient_cd
- subgradient_cd

max_iter	maximum iterations. This also tunes the step size.
tolerance	tolerance

Value

A class `pros`

Examples

```
fit = pros(X_train, y_train, lambda = .1)
pred = predict(fit, X_test)
```

Index