Package 'pros'

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Title Penalized Regression on Steroids

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

Depends R (>= 3.5.1)

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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 = 10, alpha = c(1, 0, 0, 0, 0, 0),
  lambdas = c(), step_size, algorithm = "proximal_gradient_cd",
  max_iter = 10000, tolerance = 10^(-8), random_seed = 0)
```

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
step_size	step size
algorithm	the optimization algorithm • proximal_gradient_cd (proximal gradient coordinate descent) • subgradient_cd (subgradient coordinate algorithm)
max_iter	maximum iterations. This also tunes the step size.
tolerance	tolerance
random_seed	random seed

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), lambda, step_size,
  algorithm = "proximal_gradient_cd", max_iter = 10000,
  tolerance = 10^(-8), random_seed = 0)
```

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
step_size	step size
algorithm	the optimization algorithm • proximal_gradient_cd (proximal gradient coordinate descent) • subgradient_cd (subgradient coordinate algorithm)
max_iter	maximum iterations. This also tunes the step size.
tolerance	tolerance
random_seed	random seed

Value

A class pros

Examples

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

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