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sklearn.linear_model.LinearRegression

class `sklearn.linear_model.LinearRegression`(*fit_intercept=True*, *normalize=False*, *copy_X=True*, *n_jobs=1*) [source]

Ordinary least squares Linear Regression.

Parameters: **fit_intercept** : boolean, optional, default True

whether to calculate the intercept for this model. If set to False, no intercept will be used in calculations (e.g. data is expected to be already centered).

normalize : boolean, optional, default False

This parameter is ignored when `fit_intercept` is set to False. If True, the regressors X will be normalized before regression by subtracting the mean and dividing by the l2-norm. If you wish to standardize, please use `sklearn.preprocessing.StandardScaler` before calling `fit` on an estimator with `normalize=False`.

copy_X : boolean, optional, default True

If True, X will be copied; else, it may be overwritten.

n_jobs : int, optional, default 1

The number of jobs to use for the computation. If -1 all CPUs are used. This will only provide speedup for n_targets > 1 and sufficient large problems.

Attributes:

coef_ : array, shape (n_features,) or (n_targets, n_features)

Estimated coefficients for the linear regression problem. If multiple targets are passed during the fit (y 2D), this is a 2D array of shape (n_targets, n_features), while if only one target is passed, this is a 1D array of length n_features.

intercept_ : array

Independent term in the linear model.

Notes

From the implementation point of view, this is just plain Ordinary Least Squares (scipy.linalg.lstsq) wrapped as a predictor object.

Methods

`fit`(X, y[, sample_weight])	Fit linear model.
`get_params`([deep])	Get parameters for this estimator.
`predict`(X)	Predict using the linear model
`score`(X, y[, sample_weight])	Returns the coefficient of determination R^2 of the prediction.
`set_params`(**params)	Set the parameters of this estimator.

`__init__`(*fit_intercept=True*, *normalize=False*, *copy_X=True*, *n_jobs=1*) [source]

`fit`(*X*, *y*, *sample_weight=None*) [source]

Fit linear model.

Parameters: **X** : numpy array or sparse matrix of shape

[n_samples,n_features]

Training data

y : numpy array of shape [n_samples, n_targets]

Target values. Will be cast to X's dtype if necessary

sample_weight : numpy array of shape [n_samples]

Individual weights for each sample

New in version 0.17: parameter *sample_weight* support to LinearRegression.

Returns:	**self** : returns an instance of self.

`get_params(deep=True)` [source]

Get parameters for this estimator.

Parameters:	**deep** : boolean, optional If True, will return the parameters for this estimator and contained subobjects that are estimators.
Returns:	**params** : mapping of string to any Parameter names mapped to their values.

«

`predict(X)` [source]

Predict using the linear model

Parameters:	**X** : {array-like, sparse matrix}, shape = (n_samples, n_features)

Samples.

Returns:	**C** : array, shape = (n_samples,) Returns predicted values.

score(*X, y, sample_weight=None*) [source]

Returns the coefficient of determination R^2 of the prediction.

The coefficient R^2 is defined as (1 - u/v), where u is the residual sum of squares ((y_true - y_pred) ** 2).sum() and v is the total sum of squares ((y_true - y_true.mean()) ** 2).sum(). The best possible score is 1.0 and it can be negative (because the model can be arbitrarily worse). A constant model that always predicts the expected value of y, disregarding the input features, would get a R^2 score of 0.0.

Parameters:	**X** : array-like, shape = (n_samples, n_features) Test samples. **y** : array-like, shape = (n_samples) or (n_samples, n_outputs) True values for X. **sample_weight** : array-like, shape = [n_samples], optional Sample weights.
Returns:	**score** : float R^2 of self.predict(X) wrt. y.

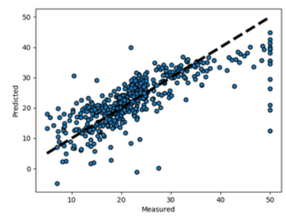
set_params(***params*) [source]

Set the parameters of this estimator.

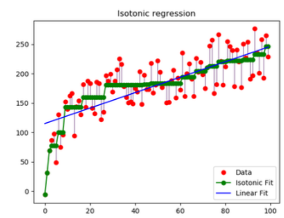
The method works on simple estimators as well as on nested objects (such as pipelines). The latter have parameters of the form <component>__<parameter> so that it's possible to update each component of a nested object.

Returns:	**self** :

Examples using `sklearn.linear_model.LinearRegression`

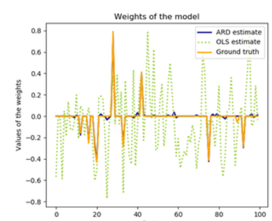


Plotting Cross-Validated Predictions

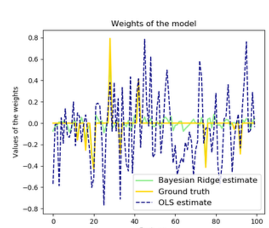


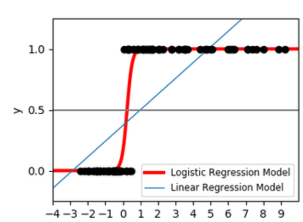
Isotonic Regression

Face completion with a multi-output estimators



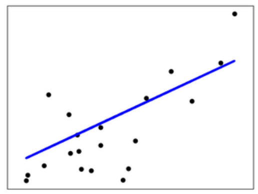
Automatic Relevance Determination Regression (ARD)



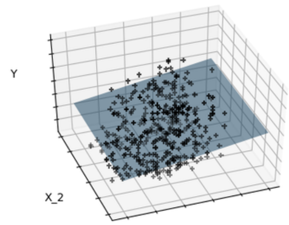


Bayesian Ridge Regression

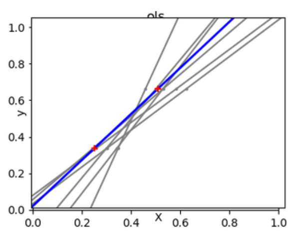
Logistic function



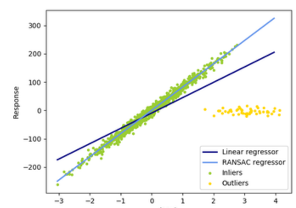
Linear Regression Example



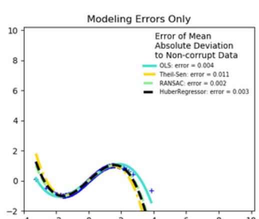
Sparsity Example: Fitting only features 1 and 2



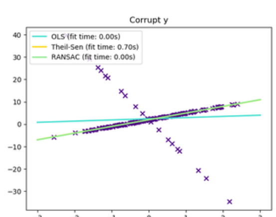
Ordinary Least Squares and Ridge Regression Variance



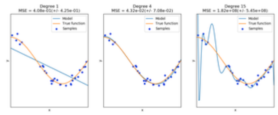
Robust linear model estimation using RANSAC



Robust linear estimator fitting



Theil-Sen Regression



Underfitting vs. Overfitting