sklearn.model_selection.cross_val_score

`sklearn.model_selection.`**`cross_val_score`**(*estimator*, *X*, *y=None*, ***, *groups=None*, *scoring=None*, *cv=None*, *n_jobs=None*, *verbose=0*, *fit_params=None*, *pre_dispatch='2*n_jobs'*, *error_score=nan*) [source]

Evaluate a score by cross-validation.

Read more in the User Guide.

Parameters:

estimator : ***estimator object implementing 'fit'***
The object to use to fit the data.

X : ***array-like of shape (n_samples, n_features)***
The data to fit. Can be for example a list, or an array.

y : ***array-like of shape (n_samples,) or (n_samples, n_outputs), default=None***
The target variable to try to predict in the case of supervised learning.

groups : ***array-like of shape (n_samples,), default=None***
Group labels for the samples used while splitting the dataset into train/test set. Only used in conjunction with a "Group" cv instance (e.g., `GroupKFold`).

scoring : ***str or callable, default=None***
A str (see model evaluation documentation) or a scorer callable object / function with signature `scorer(estimator, X, y)` which should return only a single value.

Similar to `cross_validate` but only a single metric is permitted.

If `None`, the estimator's default scorer (if available) is used.

cv : ***int, cross-validation generator or an iterable, default=None***
Determines the cross-validation splitting strategy. Possible inputs for cv are:

- `None`, to use the default 5-fold cross validation,
- int, to specify the number of folds in a `(Stratified)KFold`,
- CV splitter,
- An iterable that generates (train, test) splits as arrays of indices.

For `int`/`None` inputs, if the estimator is a classifier and `y` is either binary or multiclass, `StratifiedKFold` is used. In all other cases, `KFold` is used. These splitters are instantiated with `shuffle=False` so the splits will be the same across calls.

Refer User Guide for the various cross-validation strategies that can be used here.

Changed in version 0.22: `cv` default value if `None` changed from 3-fold to 5-fold.

n_jobs : ***int, default=None***
Number of jobs to run in parallel. Training the estimator and computing the score are parallelized over the cross-validation splits. `None` means 1 unless in a `joblib.parallel_backend` context. `-1` means using all processors. See Glossary for more details.

verbose : ***int, default=0***
The verbosity level.

fit_params : ***dict, default=None***

Parameters to pass to the fit method of the estimator.

pre_dispatch : *int or str, default='2*n_jobs'*

Controls the number of jobs that get dispatched during parallel execution. Reducing this number can be useful to avoid an explosion of memory consumption when more jobs get dispatched than CPUs can process. This parameter can be:

- `None`, in which case all the jobs are immediately created and spawned. Use this for lightweight and fast-running jobs, to avoid delays due to on-demand spawning of the jobs
- An int, giving the exact number of total jobs that are spawned
- A str, giving an expression as a function of n_jobs, as in '2*n_jobs'

error_score : *'raise' or numeric, default=np.nan*

Value to assign to the score if an error occurs in estimator fitting. If set to 'raise', the error is raised. If a numeric value is given, FitFailedWarning is raised.

New in version 0.20.

Returns:

scores : *ndarray of float of shape=(len(list(cv)),)*

Array of scores of the estimator for each run of the cross validation.

See also:

`cross_validate`

To run cross-validation on multiple metrics and also to return train scores, fit times and score times.

`cross_val_predict`

Get predictions from each split of cross-validation for diagnostic purposes.

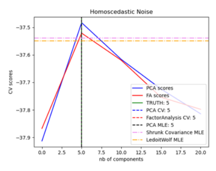
`sklearn.metrics.make_scorer`

Make a scorer from a performance metric or loss function.

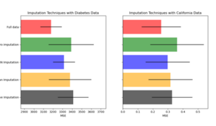
Examples

```
>>> from sklearn import datasets, linear_model
>>> from sklearn.model_selection import cross_val_score
>>> diabetes = datasets.load_diabetes()
>>> X = diabetes.data[:150]
>>> y = diabetes.target[:150]
>>> lasso = linear_model.Lasso()
>>> print(cross_val_score(lasso, X, y, cv=3))
[0.3315057  0.08022103 0.03531816]
```

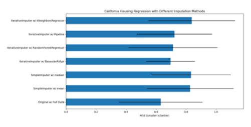
Examples using `sklearn.model_selection.cross_val_score`



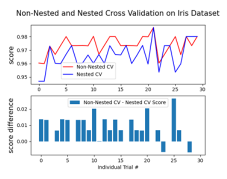
Model selection with Probabilistic PCA and Factor Analysis (FA)



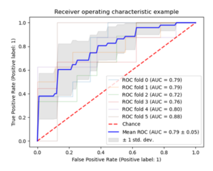
Imputing missing values before building an estimator



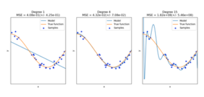
Imputing missing values with variants of IterativeImputer



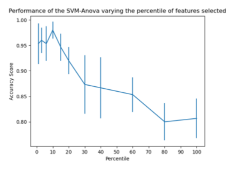
Nested versus non-nested cross-validation



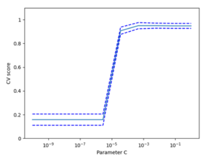
Receiver Operating Characteristic (ROC) with cross validation



[Underfitting vs. Overfitting](#)



[SVM-Anova: SVM with univariate feature selection](#)



[Cross-validation on Digits Dataset Exercise](#)

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