



UNIVERSIDADE  
CATÓLICA  
PORTUGUESA

BRAGA

# Machine Learning

Session 12 - PL

## Tree-Based Models – Part 2

Degree in Applied Data Science

2024/2025

# Random Forests in Scikit-Learn

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestClassifier.html>

## `sklearn.ensemble.RandomForestClassifier`

```
class sklearn.ensemble.RandomForestClassifier(n_estimators=100, *, criterion='gini', max_depth=None,
min_samples_split=2, min_samples_leaf=1, min_weight_fraction_leaf=0.0, max_features='sqrt', max_leaf_nodes=None,
min_impurity_decrease=0.0, bootstrap=True, oob_score=False, n_jobs=None, random_state=None, verbose=0,
warm_start=False, class_weight=None, ccp_alpha=0.0, max_samples=None, monotonic_cst=None)
```

[\[source\]](#)

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.RandomForestRegressor.html>

## `sklearn.ensemble.RandomForestRegressor`

```
class sklearn.ensemble.RandomForestRegressor(n_estimators=100, *, criterion='squared_error', max_depth=None,
min_samples_split=2, min_samples_leaf=1, min_weight_fraction_leaf=0.0, max_features=1.0, max_leaf_nodes=None,
min_impurity_decrease=0.0, bootstrap=True, oob_score=False, n_jobs=None, random_state=None, verbose=0,
warm_start=False, ccp_alpha=0.0, max_samples=None, monotonic_cst=None)
```

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# Boosting in Scikit-Learn

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.GradientBoostingClassifier.html>

## `sklearn.ensemble.GradientBoostingClassifier`

```
class sklearn.ensemble.GradientBoostingClassifier(* , loss='log_loss', learning_rate=0.1, n_estimators=100, subsample=1.0, criterion='friedman_mse', min_samples_split=2, min_samples_leaf=1, min_weight_fraction_leaf=0.0, max_depth=3, min_impurity_decrease=0.0, init=None, random_state=None, max_features=None, verbose=0, max_leaf_nodes=None, warm_start=False, validation_fraction=0.1, n_iter_no_change=None, tol=0.0001, ccp_alpha=0.0)[source]
```

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.GradientBoostingRegressor.html>

## `sklearn.ensemble.GradientBoostingRegressor`

```
class sklearn.ensemble.GradientBoostingRegressor(* , loss='squared_error', learning_rate=0.1, n_estimators=100, subsample=1.0, criterion='friedman_mse', min_samples_split=2, min_samples_leaf=1, min_weight_fraction_leaf=0.0, max_depth=3, min_impurity_decrease=0.0, init=None, random_state=None, max_features=None, alpha=0.9, verbose=0, max_leaf_nodes=None, warm_start=False, validation_fraction=0.1, n_iter_no_change=None, tol=0.0001, ccp_alpha=0.0)[source]
```

# AdaBoost in Scikit-Learn

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.AdaBoostClassifier.html>

## `sklearn.ensemble.AdaBoostClassifier`

```
class sklearn.ensemble.AdaBoostClassifier(estimator=None, *, n_estimators=50, learning_rate=1.0,  
algorithm='SAMME.R', random_state=None)
```

[\[source\]](#)

- <https://scikit-learn.org/stable/modules/generated/sklearn.ensemble.AdaBoostRegressor.html>

## `sklearn.ensemble.AdaBoostRegressor`

```
class sklearn.ensemble.AdaBoostRegressor(estimator=None, *, n_estimators=50, learning_rate=1.0, loss='linear',  
random_state=None)
```

[\[source\]](#)

# Exercises:

- Notebooks on the github repository:
  - Notebook with examples:
    - `exercises/session12/examples.ipynb`
  - Notebook with exercises:
    - `exercises/session12/exercises.ipynb`