

Models training and selection

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```
# PATH TO CUSTOM MODULES
import sys

sys.path.append("../src")

# IMPORT LIBRARIES
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

# MODELS
from sklearn.neighbors import KNeighborsClassifier
from sklearn.naive_bayes import GaussianNB
from sklearn.svm import SVC
from sklearn.ensemble import RandomForestClassifier
```

```

from xgboost import XGBClassifier
from sklearn.linear_model import LogisticRegression
from sklearn.ensemble import AdaBoostClassifier

from sklearn.model_selection import GridSearchCV
from sklearn.model_selection import cross_val_score
from sklearn.metrics import (
    roc_curve,
    auc,
    roc_auc_score,
    confusion_matrix,
    classification_report,
    accuracy_score,
    precision_score,
    recall_score,
    f1_score,
    precision_recall_curve,
    average_precision_score,
)

import glob
import os

# IMPORT CUSTOM MODULES
import utils.loadDataUtils as ldu
import utils.modelsUtils as mu

# DIRECTORIES
input_path = "../data/processed/"

training_path = input_path + "train_data/"
test_path = input_path + "test_data/"

results_path = "../models/results/"
figures_path = "../../Memoria/figures/"

# FILES
results_file = "results_table.csv"

```

```

# GET TRAINING AND TEST CSV FILES
training_csv_files = ldu.get_csv_files(training_path)
test_csv_files = ldu.get_csv_files(test_path)

# GET DATASET NAMES FROM CSV FILES
dataset_names = ldu.get_dataset_names(training_csv_files)

# LOAD TRAINING AND TEST DATA
datasets = ldu.load_training_test_datasets(
    datasets_names=dataset_names, training_path=training_path, test_path=test_path
)

```

1 CALCULATE MODELS FOR EACH DATASET

1.1 GLOBAL VARIABLES

```

parameters_grids = list()
model_names = list()

```

1.1.1 KNN PARAMETERS GRID

```

k_range = range(1, 101, 10)
distance_range = ["euclidean", "minkowski", "manhattan", "chebyshev", "jaccard"]
k_weight_range = ["uniform", "distance"]
parameters_grid_knn = dict(
    n_neighbors=k_range, metric=distance_range, weights=k_weight_range
)
model_name = "k-NN"

parameters_grids.append(parameters_grid_knn)
model_names.append(model_name)

```

1.1.2 NAIIVE BAYES PARAMETERS GRID

```
nb_var_smoothing = np.logspace(0, -9, num=100)
parameters_grid_naive_bayes = dict(
    var_smoothing=nb_var_smoothing,
)
model_name = "Naive_Bayes"

parameters_grids.append(parameters_grid_naive_bayes)
model_names.append(model_name)
```

1.1.3 SVM PARAMETERS GRID

```
parameters_grid_svm = {
    "kernel": ["linear", "poly", "rbf", "sigmoid"],
    "C": [0.1, 1, 10, 100, 1000],
    "gamma": [1, 0.1, 0.01, 0.001, 0.0001],
}
model_name = "SVM"

parameters_grids.append(parameters_grid_svm)
model_names.append(model_name)
```

1.1.4 RANDOM FOREST PARAMETERS GRID

```
parameters_grid_random_forest = {
    "n_estimators": [10, 50, 100],
    "max_depth": [5, 10, 50],
    "min_samples_split": [5, 10, 20],
    "min_samples_leaf": [5, 10, 50],
    "max_features": ["sqrt", "log2"],
}
model_name = "Random_Forest"

parameters_grids.append(parameters_grid_random_forest)
model_names.append(model_name)
```

1.1.5 XGBOOST PARAMETERS GRID

```
xgboost_n_estimators = [1, 10, 50, 100]
xgboost_max_depth = [3, 5, 10]
xgboost_learning_rate = [0.01, 0.1]
xgboost_gamma = [0, 0.1, 0.4]
xgboost_colsample_bytree = [0.3]
xgboost_subsample = [0.3]
xgboost_reg_alpha = [0, 0.1]
xgboost_reg_lambda = [0.1]

parameters_grid_xgboost = {
    "n_estimators": [10, 50, 100],
    "max_depth": [5, 10, 50],
    "min_samples_split": [5, 10, 20],
    "min_samples_leaf": [5, 10, 50],
    "max_features": ["sqrt", "log2"],
}
model_name = "XGBoost"

parameters_grids.append(parameters_grid_xgboost)
model_names.append(model_name)

parameters_grid_logistic_regression = {
    "penalty": ["l1", "l2", "elasticnet", "none"],
    "C": [0.1, 1, 10, 100, 1000],
    "solver": ["newton-cg", "lbfgs", "liblinear", "sag", "saga"],
    "max_iter": [100, 1000, 2500, 5000],
}
model_name = "Logistic_Regression"

parameters_grids.append(parameters_grid_logistic_regression)
model_names.append(model_name)

parameters_grid_ada_boost = {
    "n_estimators": [10, 50, 100],
    "learning_rate": [0.01, 0.1, 1],
    "algorithm": ["SAMME", "SAMME.R"],
}
model_name = "Ada_Boost"
```

```
parameters_grids.append(parameters_grid_ada_boost)
model_names.append(model_name)
```

1.2 INSTANTIATE MODELS

```
models = list()

knn_model = KNeighborsClassifier()
models.append(knn_model)

naive_bayes_model = GaussianNB()
models.append(naive_bayes_model)

svm_model = SVC()
models.append(svm_model)

random_forest_model = RandomForestClassifier()
models.append(random_forest_model)

xgboost_model = XGBClassifier()
models.append(xgboost_model)

logistic_regression_model = LogisticRegression()
models.append(logistic_regression_model)

ada_boost_model = AdaBoostClassifier()
models.append(ada_boost_model)
```

1.3 BUILD KNN MODELS

```
models_results = dict()

for i in range(len(models)):
    model = models[i]
    parameters_grid = parameters_grids[i]
    model_name = model_names[i]
```

```

model_results = mu.calculate_models(
    model=model,
    parameters_grid=parameters_grid,
    datasets=datasets,
    model_name=model_name,
)

results = model_results[0]
roc_curves = model_results[1]

# OPEN FILE
file = open(results_path + results_file, "a")
# REMOVE ROWS IN TABLE_RESULTS.CSV THAT STARTS WITH k-NN
table_results = pd.read_csv(results_path + results_file)
table_results = table_results[
    ~table_results["model_name"].str.startswith(model_name)
]
table_results.to_csv(results_path + results_file, index=False)
# WRITE RESULTS
results.to_csv(file, header=False, index=False)
# CLOSE FILE
file.close()

models_results[model_name] = roc_curves

```

Fitting 5 folds for each of 100 candidates, totalling 500 fits

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Fitting 5 folds for each of 162 candidates, totalling 810 fits

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[00:32:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Fitting 5 folds for each of 162 candidates, totalling 810 fits

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Fitting 5 folds for each of 162 candidates, totalling 810 fits

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Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-

[00:33:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:32:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Fitting 5 folds for each of 162 candidates, totalling 810 fits

[00:33:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:12] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:46] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Fitting 5 folds for each of 162 candidates, totalling 810 fits

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:45] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:46] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:47] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:47] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:55] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:53] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:06] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:48] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:54] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:54] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:53] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:56] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:01] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:10] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:13] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:14] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:15] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:16] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:33:26] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:27] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:27] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:28] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:28] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:28] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:54] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:57] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:03] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:04] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:13] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:14] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:08] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:12] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:15] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:34:21] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
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[00:34:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:25] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9

[00:33:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:59] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:02] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:05] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:12] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:15] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:19] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:22] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:24] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:44] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:44] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:44] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:45] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:46] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:47] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:47] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:50] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:52] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:53] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:55] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:33:58] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:00] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:07] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:09] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:11] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:13] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:14] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:15] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:16] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:18] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:20] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:23] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.

[00:34:27] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.


```
[00:36:15] WARNING: /Users/runner/work/xgboost/xgboost/python-package/build/temp.macosx-10.9-  
Parameters: { "max_features", "min_samples_leaf", "min_samples_split" } are not used.
```

Fitting 5 folds for each of 400 candidates, totalling 2000 fits

Fitting 5 folds for each of 400 candidates, totalling 2000 fits

Fitting 5 folds for each of 400 candidates, totalling 2000 fits

Fitting 5 folds for each of 400 candidates, totalling 2000 fits

Fitting 5 folds for each of 400 candidates, totalling 2000 fits

Fitting 5 folds for each of 18 candidates, totalling 90 fits

Fitting 5 folds for each of 18 candidates, totalling 90 fits

Fitting 5 folds for each of 18 candidates, totalling 90 fits

Fitting 5 folds for each of 18 candidates, totalling 90 fits

Fitting 5 folds for each of 18 candidates, totalling 90 fits

2 RESULTS

```
# PLOT ROC CURVES  
for model in models_results:  
    roc_curves = models_results[model]  
    roc_curve = mu.plot_all_roc_curves(  
        roc_curves=roc_curves, model_name=model, figure_path=figures_path, save=True  
    )
```













