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##https://www.geeksforgeeks.org/random-forest-classifier-using-scikit-learn/
import pandas as pd
import numpy as np
iris=pd.read_csv("iris.csv")
print(iris.target_names)
print(iris.feature_names)
# dividing the datasets into two parts i.e. training datasets and test datasets
X, y = datasets.load_iris( return_X_y = True)

# Splitting arrays or matrices into random train and test subsets
from sklearn.model_selection import train_test_split
# i.e. 70 % training dataset and 30 % test datasets
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size = 0.30)

# importing random forest classifier from assemble module
from sklearn.ensemble import RandomForestClassifier
import pandas as pd
# creating dataframe of IRIS dataset
data = pd.DataFrame({'sepallength': iris.data[:, 0], 'sepalwidth': iris.data[:, 1],
                    'petallength': iris.data[:, 2], 'petalwidth': iris.data[:, 3],
                    'species': iris.target})
# printing the top 5 datasets in iris dataset
print(data.head())
# creating a RF classifier
clf = RandomForestClassifier(n_estimators = 100)

# Training the model on the training dataset
# fit function is used to train the model using the training sets as parameters
clf.fit(X_train, y_train)

# performing predictions on the test dataset
y_pred = clf.predict(X_test)

# metrics are used to find accuracy or error
from sklearn import metrics
print()

# using metrics module for accuracy calculation
print("ACCURACY OF THE MODEL: ", metrics.accuracy_score(y_test, y_pred))
# predicting which type of flower it is.
clf.predict([[3, 3, 2, 2]])
# importing random forest classifier from assemble module
from sklearn.ensemble import RandomForestClassifier

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# Create a Random forest Classifier
clf = RandomForestClassifier(n_estimators = 100)

# Train the model using the training sets
clf.fit(X_train, y_train)
# using the feature importance variable
import pandas as pd
feature_imp = pd.Series(clf.feature_importances_, index =
iris.feature_names).sort_values(ascending = False)
feature_imp
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