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import pandas as pd
import numpy as np
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.preprocessing import StandardScaler
from sklearn.ensemble import RandomForestClassifier
import pickle
from sklearn.pipeline import make_pipeline

df=pd.read_csv("Iris.csv")

obj_list=list(df.select_dtypes(['object']).columns)

for colname in obj_list:
    df[colname]=df[colname].astype('category')

df.drop("Id", axis=1, inplace=True)

X=df.drop("Species", axis=1)
y=df["Species"]

X_train,X_test,y_train,y_test=train_test_split(X,y,test_size=0.25,random_state=42)

rf_params = {"n_estimators" : [10,20,30],
             "min_samples_split" : np.arange(2,10),
             "min_samples_leaf" : np.arange(1,10),
             "max_features" : np.arange(1,5)}

rf_model=RandomForestClassifier()

rf_cv_model=GridSearchCV(rf_model,rf_params,cv=10,n_jobs=-1,verbose=2)

pipe = make_pipeline(StandardScaler(),rf_cv_model)
pipe.fit(X_train, y_train)

pickle.dump(pipe, open("model.pkl", "wb"))

model = pickle.load(open("model.pkl", "rb"))

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