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

columns = ['sepal length','sepal width','petal length','petal width','Species']
data = pd.read_csv('/content/iris flower .csv',index_col =0)
data

data.describe()

sns.pairplot(data, hue ='Species')

data = data.values
X = data[:,0:4]
Y = data[:,4]

Y_Data = np.array([np.average(X[:, i][Y==j].astype('float32')) for i in range
(X.shape[1])
for j in (np.unique(Y))])
Y_Data_resaped = Y_Data.reshape (4, 3)
Y_Data_resaped = np.swapaxes(Y_Data_resaped, 0, 1)
X_axis = np.arange(len (columns)-1)
width = 0.25

plt.bar(X_axis, Y_Data_resaped [0], width, label = 'Setosa')
plt.bar(X_axis+width,Y_Data_resaped[1],width,label='Versicolour')
plt.bar(X_axis+width*2, Y_Data_resaped[2],width,label = 'Virginica')
plt.xticks(X_axis, columns[:4])
plt.xlabel("features")
plt.ylabel("Value in cm.")
plt.legend(bbox_to_anchor=(1.3,1))
plt.show()

from sklearn.model_selection import train_test_split
X_train, X_test, y_train, y_test = train_test_split(X,Y,test_size= 0.2)

from sklearn.svm import SVC
svn = SVC()
svn.fit(X_train, y_train)

predictions = svn.predict(X_test)

from sklearn.metrics import accuracy_score
accuracy = accuracy_score(y_test, predictions)
print("Accuracy:",accuracy*100)

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from sklearn.metrics import classification_report
print(classification_report(y_test, predictions))
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X_new = np.array([[3 ,2 ,1 ,0.2],[ 4.9,2.2,3.8,1.1],[ 5.3,2.5,4.6,1.9]])
prediction = svm.predict(X_new)
print(" Prediction of Species: {}".format(prediction ))
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