

E:\iris flower.py

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1 import numpy as np
2 import matplotlib.pyplot as plt
3 import seaborn as sns
4 import pandas as pd
5 columns = ['Sepal length', 'Sepal width', 'Petal length', 'Petal width', 'Class_labels']
6 # Load the data
7 df = pd.read_csv('iris.data', names=columns)
8 df.head()
9 # Some basic statistical analysis about the data
10 df.describe()
11 # Visualize the whole dataset
12 sns.pairplot(df, hue='Class_labels')
13 # Separate features and target
14 data = df.values
15 X = data[:,0:4]
16 Y = data[:,4]
17 # Calculate average of each features for all classes
18 Y_Data = np.array([np.average(X[:, i][Y==j].astype('float32')) for i in range (X.shape[1])
19     for j in (np.unique(Y))])
20 Y_Data_reshaped = Y_Data.reshape(4, 3)
21 Y_Data_reshaped = np.swapaxes(Y_Data_reshaped, 0, 1)
22 X_axis = np.arange(len(columns)-1)
23 width = 0.25
24 # Plot the average
25 plt.bar(X_axis, Y_Data_reshaped[0], width, label = 'Setosa')
26 plt.bar(X_axis+width, Y_Data_reshaped[1], width, label = 'Versicolour')
27 plt.bar(X_axis+width*2, Y_Data_reshaped[2], width, label = 'Virginica')
28 plt.xticks(X_axis, columns[:4])
29 plt.xlabel("Features")
30 plt.ylabel("Value in cm.")
31 plt.legend(bbox_to_anchor=(1.3,1))
32 plt.show()
33 # Split the data to train and test dataset.
34 from sklearn.model_selection import train_test_split
35 X_train, X_test, y_train, y_test = train_test_split(X, Y, test_size=0.2)
36 # Support vector machine algorithm
37 from sklearn.svm import SVC
38 svn = SVC()
39 svn.fit(X_train, y_train)
40
```