Decision Tree for Iris FLower Multi-class Classification

Import libs

In [1]:
```
import numpy as np
import pandas as pd
```

Load Data

In [2]:
```
from sklearn.datasets import load_iris
```

In [3]:
```
iris = load_iris()
```

In [4]:
```
iris.keys()
```

Out[4]:
```
dict_keys(['data', 'target', 'target_names', 'DESCR', 'feature_names', 'filen
ame'])
```

In [5]:
```
iris.target_names
```

Out[5]:
```
array(['setosa', 'versicolor', 'virginica'], dtype='<U10')
```

In [6]:
```
iris.target.shape
```

Out[6]:
```
(150,)
```

In [7]:
```
iris.data.shape
```

Out[7]:
```
(150, 4)
```

In [8]:
```
uniq, count = np.unique(iris.target, return_counts=True)
print(uniq,count)
```

```
[0 1 2] [50 50 50]
```

Make data ready

In [9]:
```
X = iris.data
y = iris.target
```

```
In [10]: X.shape
```

```
Out[10]: (150, 4)
```

Decision Tree Model

```
In [11]: from sklearn.model_selection import train_test_split
         X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.40, rand
         om_state=42)
```

```
In [12]: from sklearn.tree import DecisionTreeClassifier
```

```
In [13]: dtree = DecisionTreeClassifier()
         dtree.fit(X_train, y_train)
```

```
Out[13]: DecisionTreeClassifier(class_weight=None, criterion='gini', max_depth=None,
                     max_features=None, max_leaf_nodes=None,
                     min_impurity_decrease=0.0, min_impurity_split=None,
                     min_samples_leaf=1, min_samples_split=2,
                     min_weight_fraction_leaf=0.0, presort=False, random_state=None,
                     splitter='best')
```

Prediction

```
In [14]: pred = dtree.predict(X_test)
```

```
In [ ]:
```

Evaluation

```
In [15]: from sklearn.metrics import confusion_matrix, classification_report
         from sklearn.metrics import accuracy_score
```

In [16]:

```
print(classification_report(y_test, pred))
print('ConfusionMatrix:\n',confusion_matrix(y_test, pred))
print('\nAcuracy: {0:.2f}\n' .format(accuracy_score(y_test, pred)))
```

```
              precision    recall  f1-score   support

           0       1.00      1.00      1.00        23
           1       0.95      0.95      0.95        19
           2       0.94      0.94      0.94        18

   micro avg       0.97      0.97      0.97        60
   macro avg       0.96      0.96      0.96        60
weighted avg       0.97      0.97      0.97        60

ConfusionMatrix:
 [[23  0  0]
 [ 0 18  1]
 [ 0  1 17]]

Acuracy: 0.97
```