Q2

August 11, 2025

0.1 Decision Tree Classifeier

[1]:
```
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
import matplotlib.pyplot as plt
```

[2]:
```
iris= load_iris()

X,y= iris.data, iris.target
```

[3]:
```
X_train, X_test, y_train, y_test= train_test_split(X, y, test_size=0.2,␣
 ↪random_state=30)
```

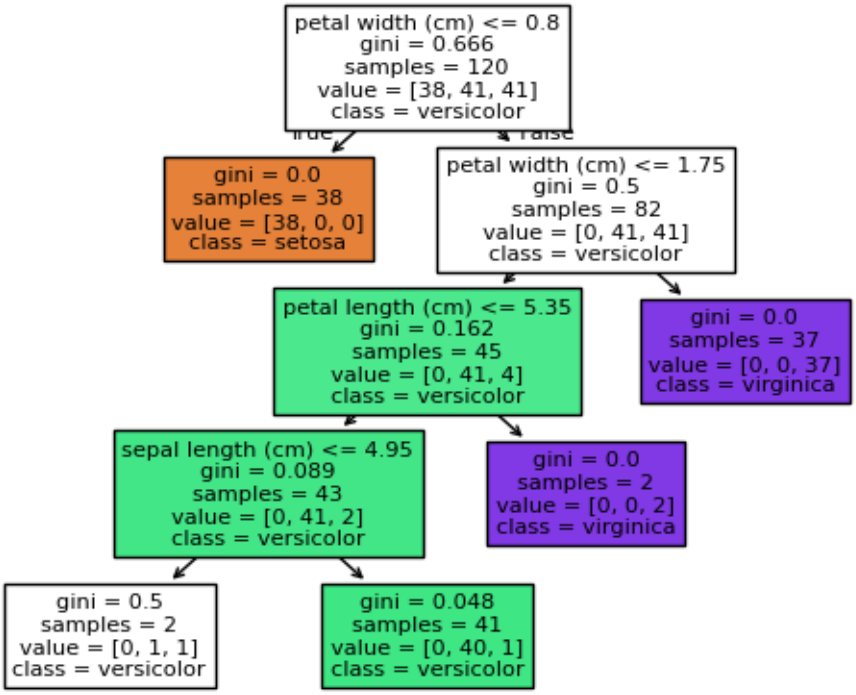
[13]:
```
classifier= DecisionTreeClassifier(criterion='gini',max_depth=4,␣
 ↪random_state=30)
classifier.fit(X_train, y_train)
```

[13]:
```
DecisionTreeClassifier(max_depth=4, random_state=30)
```

[14]:
```
accuracy= classifier.score(X_train, y_train)
print(f'Accuracy:{accuracy:.2f}')
```

```
Accuracy:0.98
```

[15]:
```
plot_tree(classifier, feature_names=iris.feature_names, class_names=iris.
 ↪target_names,filled=True)
plt.show()
```


petal width (cm) <= 0.8
gini = 0.666
samples = 120
value = [38, 41, 41]
class = versicolor
True
False
gini = 0.0
samples = 38
value = [38, 0, 0]
class = setosa
petal width (cm) <= 1.75
gini = 0.5
samples = 82
value = [0, 41, 41]
class = versicolor
petal length (cm) <= 5.35
gini = 0.162
samples = 45
value = [0, 41, 4]
class = versicolor
gini = 0.0
samples = 37
value = [0, 0, 37]
class = virginica
sepal length (cm) <= 4.95
gini = 0.089
samples = 43
value = [0, 41, 2]
class = versicolor
gini = 0.0
samples = 2
value = [0, 0, 2]
class = virginica
gini = 0.5
samples = 2
value = [0, 1, 1]
class = versicolor
gini = 0.048
samples = 41
value = [0, 40, 1]
class = versicolor

[ ]: