Q2&Q5

August 13, 2025

0.1 Decision Tree Classifeier

[8]:
```
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.metrics import confusion_matrix, ConfusionMatrixDisplay
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)
```

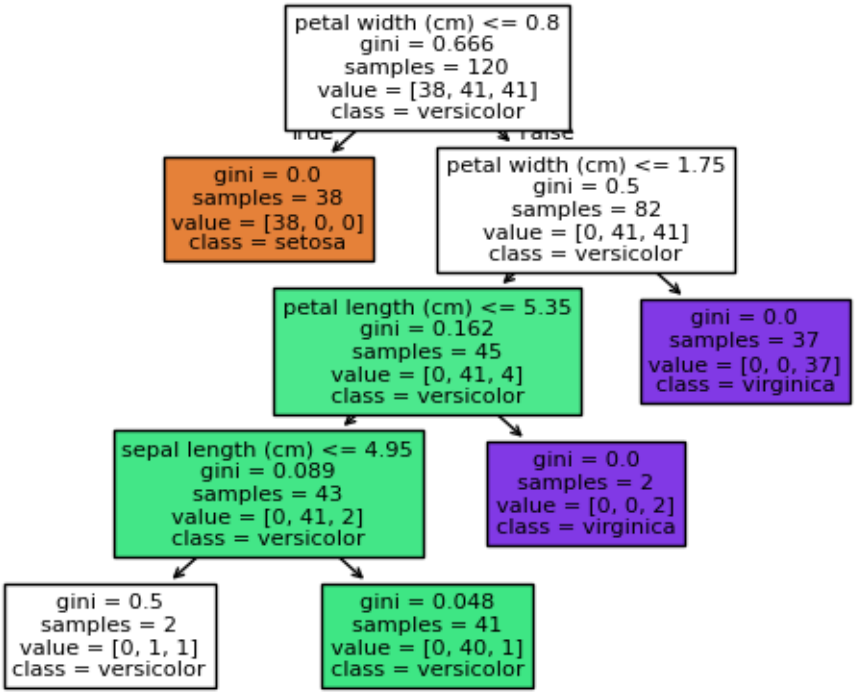
[4]:
```
classifier= DecisionTreeClassifier(criterion='gini',max_depth=4,␣
 ↪random_state=30)
classifier.fit(X_train, y_train)
```

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

[5]:
```
accuracy= classifier.score(X_train, y_train)
print(f'Accuracy:{accuracy:.2f}')
```

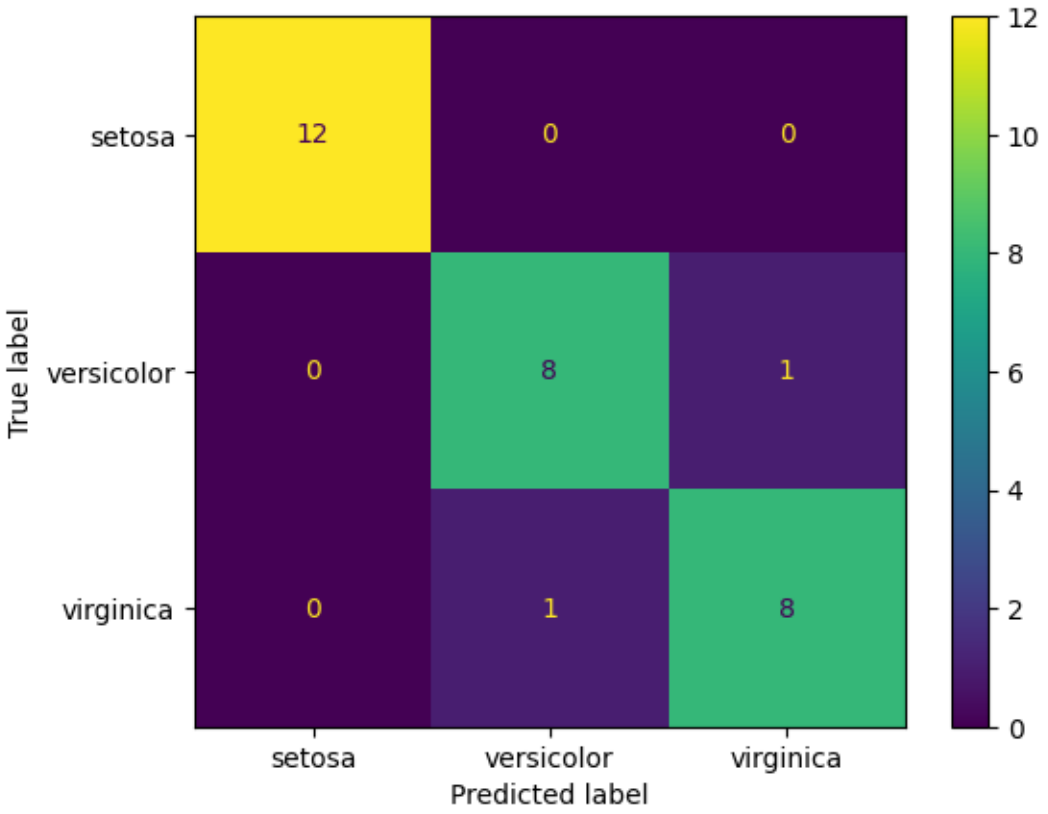
```
Accuracy:0.98
```

[6]:
```
plot_tree(classifier, feature_names=iris.feature_names, class_names=iris.
 ↪target_names,filled=True)
plt.show()
```



[7]:
```
y_pred= classifier.predict(X_test)
```

[13]:
```
cm= confusion_matrix(y_test, y_pred, labels= classifier.classes_)
disp= ConfusionMatrixDisplay(confusion_matrix=cm, display_labels= iris.
 ↪target_names)
disp.plot()
plt.show()
```


setosa
versicolor
virginica
True label
12
0
0
0
8
1
0
1
8
setosa
versicolor
virginica
Predicted label
12
10
8
6
4
2
0

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