decision-tree-fl

April 25, 2025

[2]:
```
import numpy as np
import matplotlib.pyplot as plt
from sklearn.datasets import load_breast_cancer
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score
from sklearn import tree
```

[3]:
```
data = load_breast_cancer()
X = data.data
y = data.target
```

[4]:
```
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,␣
 ↪random_state=42)
clf = DecisionTreeClassifier(random_state=42)
clf.fit(X_train, y_train)
y_pred = clf.predict(X_test)
```

[5]:
```
accuracy = accuracy_score(y_test, y_pred)
print(f"Model Accuracy: {accuracy * 100:.2f}%")
new_sample = np.array([X_test[0]])
prediction = clf.predict(new_sample)
```

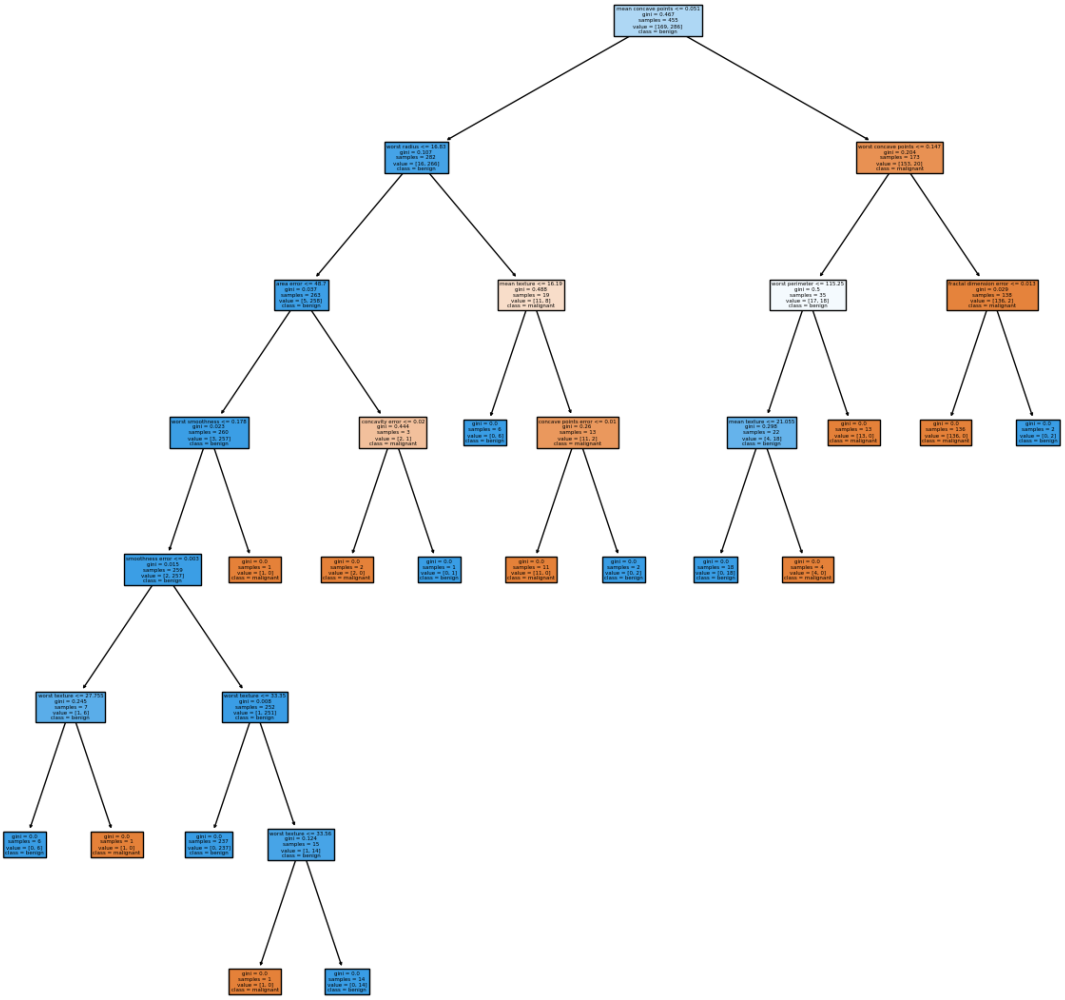
```
Model Accuracy: 94.74%
```

[6]:
```
prediction_class = "Benign" if prediction == 1 else "Malignant"
print(f"Predicted Class for the new sample: {prediction_class}")
```

```
Predicted Class for the new sample: Benign
```

[7]:
```
plt.figure(figsize=(15,15))
tree.plot_tree(clf, filled=True, feature_names=data.feature_names,␣
 ↪class_names=data.target_names)
plt.title("Decision Tree - Breast Cancer Dataset")
plt.show()
```

Decision Tree - Breast Cancer Dataset



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