

# Experiment 7 - Decision Trees

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## 1 Experiment Details

### 1.1 Submitted By

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```
[ ]: from sklearn.datasets import load_iris
from sklearn.tree import DecisionTreeClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score, classification_report, \
    ↪confusion_matrix
from sklearn.tree import plot_tree
import matplotlib.pyplot as plt
```

```
/home/volt/.local/lib/python3.10/site-packages/scipy/__init__.py:146:
UserWarning: A NumPy version >=1.16.5 and <1.23.0 is required for this version
of SciPy (detected version 1.24.3
  warnings.warn(f"A NumPy version >={np_minversion} and <{np_maxversion}")
```

```
[ ]: # Load dataset
iris = load_iris()
X_train, X_test, y_train, y_test = train_test_split(iris.data, iris.target, \
    ↪test_size=0.2, random_state=42)
```

```
[ ]: # Create decision tree classifier
clf = DecisionTreeClassifier(random_state=42)

# Train the classifier on the training data
clf.fit(X_train, y_train)
```

```
[ ]: DecisionTreeClassifier(random_state=42)
```

```
[ ]: # Evaluate the classifier on the testing data
y_pred = clf.predict(X_test)
```

```
[ ]: # Calculate and print accuracy score
print("Accuracy:", accuracy_score(y_test, y_pred))
```

```

# Print classification report
print("Classification Report:")
print(classification_report(y_test, y_pred))

# Print confusion matrix
print("Confusion Matrix:")
print(confusion_matrix(y_test, y_pred))

# Plot decision tree
plt.figure(figsize=(20,10))
plot_tree(clf, filled=True, rounded=True, class_names=iris.target_names,
          feature_names=iris.feature_names)
plt.show()

```

Accuracy: 1.0

Classification Report:

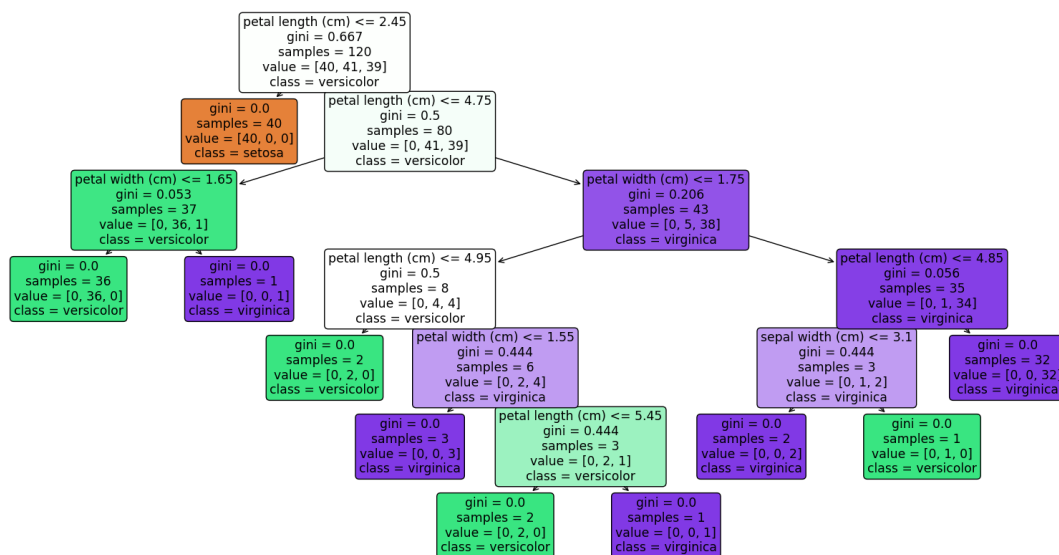
	precision	recall	f1-score	support
0	1.00	1.00	1.00	10
1	1.00	1.00	1.00	9
2	1.00	1.00	1.00	11
accuracy			1.00	30
macro avg	1.00	1.00	1.00	30
weighted avg	1.00	1.00	1.00	30

Confusion Matrix:

```

[[10  0  0]
 [ 0  9  0]
 [ 0  0 11]]

```



[ ]: