```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.datasets import load_iris
from sklearn.tree import DecisionTreeClassifier, plot_tree
from sklearn.model_selection import train_test_split
from sklearn.metrics import confusion_matrix, classification_report
```

```
# Load the Iris dataset
iris = load_iris()
X = pd.DataFrame(iris.data, columns=iris.feature_names)
y = pd.Series(iris.target)
```

```
# Split into training and testing
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
# Train Decision Tree model
model = DecisionTreeClassifier(criterion="entropy", max_depth=4, random_state=42)
model.fit(X_train, y_train)
```

```
▾                    DecisionTreeClassifier                      i ?
DecisionTreeClassifier(criterion='entropy', max_depth=4, random_state=42)
```

```
# Predictions
y_pred = model.predict(X_test)
```

```
# @title

# Evaluation
print("\nConfusion Matrix:")
print(confusion_matrix(y_test, y_pred))
print("\nClassification Report:")
print(classification_report(y_test, y_pred, target_names=iris.target_names))
```

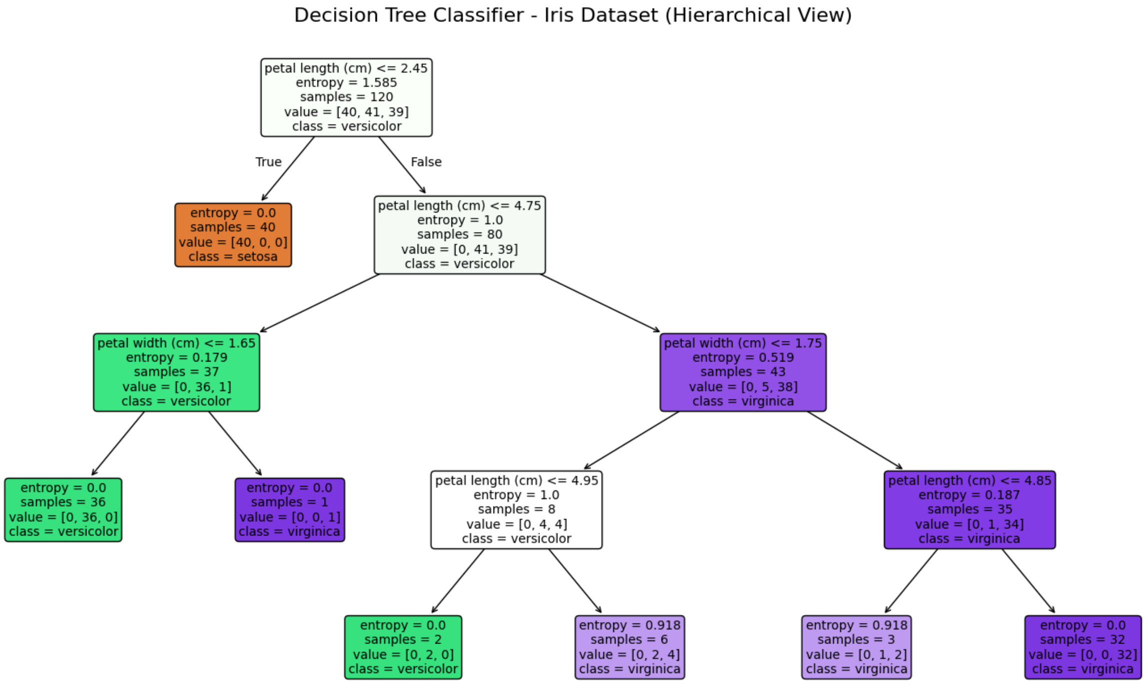
```
Confusion Matrix:
[[10  0  0]
 [ 0  9  0]
 [ 0  0 11]]

Classification Report:
              precision    recall  f1-score   support

      setosa       1.00      1.00      1.00        10
  versicolor       1.00      1.00      1.00         9
   virginica       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
```

```
# === Plot hierarchical Decision Tree ===
plt.figure(figsize=(18,10))
plot_tree(
    model,
    filled=True,
    feature_names=iris.feature_names,
    class_names=iris.target_names,
    rounded=True,
    fontsize=10
)
plt.title("Decision Tree Classifier - Iris Dataset (Hierarchical View)", fontsize=16)
plt.show()
```



Decision Tree Classifier - Iris Dataset (Hierarchical View)