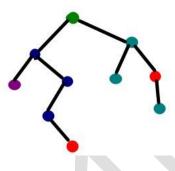
<u>EX.NO</u>: 09 <u>DATE</u>:

IMPLEMENTATION OF DECISION TREE CLASSIFICATION TECHNIQUES

<u>Decision Tree</u> is one of the most powerful and popular algorithm. Decision-tree algorithm falls under the category of supervised learning algorithms. It works for both continuous as well as categorical output variables.



AIM:

To implement a decision tree classification technique for gender classification using python.

EXPLANATION:

- Import tree from sklearn.
- Call the function DecisionTreeClassifier() from tree
- Assign values for X and Y.
- Call the function predict for Predicting on the basis of given random values for each given feature.
- Display the output.

CODE:

```
↑ ↓ ♦ 🖘
import numpy as np
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split
from sklearn.tree import DecisionTreeClassifier
from sklearn.metrics import accuracy_score, classification_report, confusion_matrix
import matplotlib.pyplot as plt
from sklearn import tree
data = load_iris()
X = data.data
y = data.target
X = X[y != 2]
y = y[y != 2]
\textbf{X\_train, X\_test, y\_train, y\_test = train\_test\_split(X, y, test\_size=0.2, random\_state=42)}
model = DecisionTreeClassifier(criterion='gini', max_depth=3, random_state=42)
model.fit(X_train, y_train)
y_pred = model.predict(X_test)
accuracy = accuracy_score(y_test, y_pred)
print(f"Accuracy: {accuracy:.2f}")
print("\nClassification Report:")
print(classification_report(y_test, y_pred, target_names=['Setosa', 'Versicolor']))
print("\nConfusion Matrix:")
print(confusion_matrix(y_test, y_pred))
plt.figure(figsize=(10,8))
tree.plot_tree(model, filled=True, feature_names=data.feature_names, class_names=['Setosa', 'Versicolor'], rounded=True)
plt.show()
```

OUTPUT:

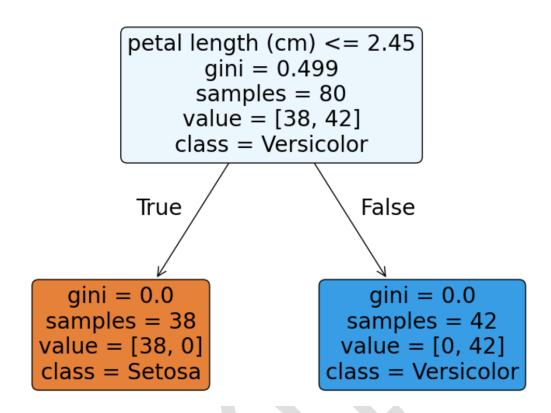
Accuracy: 1.00

Classification Report:

		precision	recall	f1-score	support
Set	tosa	1.00	1.00	1.00	12
Versicolor		1.00	1.00	1.00	8
accur	racy			1.00	20
macro	avg	1.00	1.00	1.00	20
weighted	avg	1.00	1.00	1.00	20

```
Confusion Matrix:
```

```
[[12 0]
[0 8]]
```



RESULT:

Thus, the Decision Tree Classification program has been implemented successfully.