**EXPT NO: 7 A python program to implement Decisiontree DATE: 04.10.2024**

# AIM:

To write a python program to implement a Decisiontree.

# PROCEDURE:

Implementing the decision tree using the Irisdataset involve the following steps:

**Step1:Import Necessary Libraries**

First,import the libraries that are essential for data manipulation,visualization,and model building.

import numpy as np importpandasaspd

from sklearn import datasets

fromsklearn.model\_selectionimporttrain\_test\_split from sklearn.tree import DecisionTreeClassifier

from sklearn import metrics

import matplotlib.pyplot as plt

from sklearn.tree import plot\_tree

**Step2:LoadtheIrisDataset**

TheIrisdatasetcanbeloadedanddisplaythefirstfewrowsofthedataset.

# Load the Iris dataset

iris = datasets.load\_iris()

X = iris.data # Features

y = iris.target #Target variable

**Step3:Split the dataset into training and testingsets**

# Split the dataset into training and testing sets

X\_train,X\_test,y\_train,y\_test=train\_test\_split(X,y,test\_size=0.2, random\_state=42)

**Step4:Create a decision tree classifier**

# Create a Decision Tree classifier

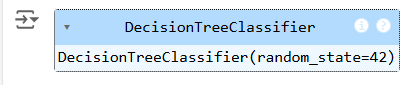
clf= DecisionTreeClassifier(random\_state=42)

**Step5:Train the model:**

# Train the model

clf.fit(X\_train, y\_train)

# OUTPUT:



**Step6:Makethepredictionsandevaluatethemodel**

# Make predictions

y\_pred = clf.predict(X\_test)

# Evaluate the model

accuracy = metrics.accuracy\_score(y\_test, y\_pred) confusion=metrics.confusion\_matrix(y\_test,y\_pred)

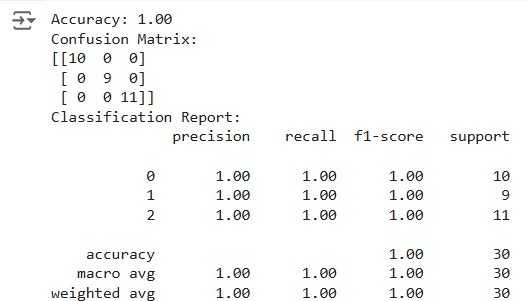
classification\_report = metrics.classification\_report(y\_test, y\_pred)

print(f"Accuracy:{accuracy:.2f}") print("Confusion Matrix:")

print(confusion)

print("ClassificationReport:") print(classification\_report)

# OUTPUT:



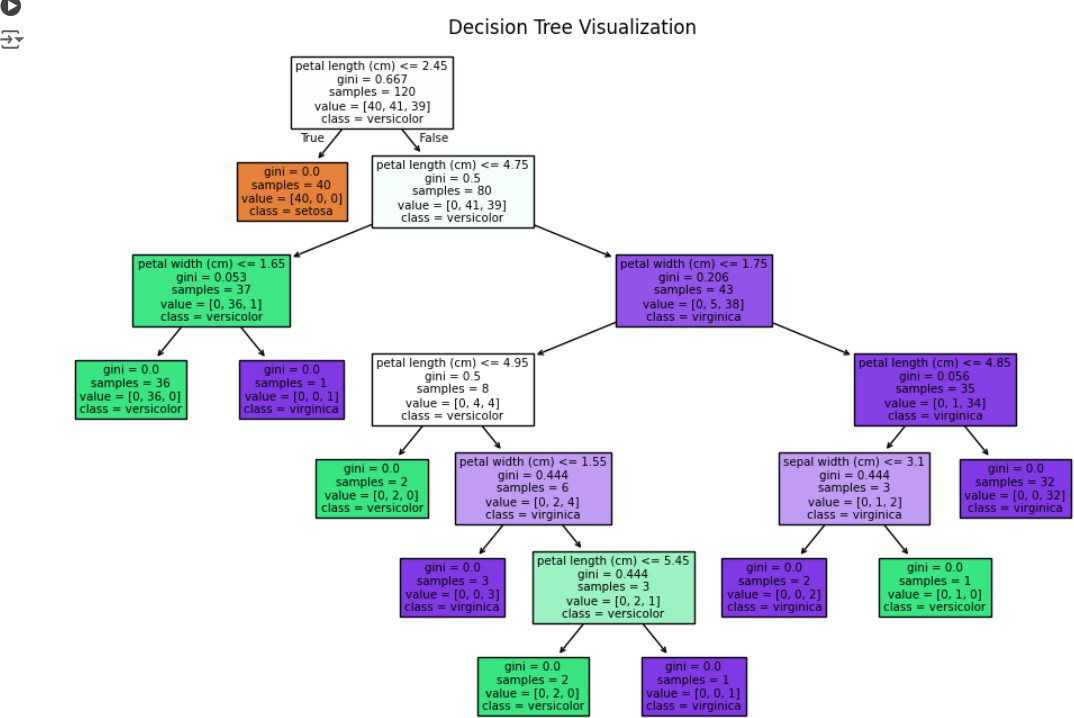
**Step7:Visualizethedecisiontree**

#VisualizetheDecisionTree plt.figure(figsize=(12,8))

plot\_tree(clf,filled=True,feature\_names=iris.feature\_names, class\_names=iris.target\_names)

plt.title("DecisionTreeVisualization") plt.show()

# OUTPUT:



**RESULT:**

**This process helps us to implement the decision tree using a python program.**