**Experiment No.: 1**

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**Aim**

 Decision trees

**Program**

import matplotlib.pyplot as plt

from sklearn.tree import DecisionTreeClassifier

from sklearn.model\_selection import train\_test\_split

from sklearn.metrics import accuracy\_score

import pandas as pd

import numpy as np

from sklearn import tree

from sklearn.datasets import load\_iris

data = load\_iris()

df = pd.DataFrame(data.data, columns=data.feature\_names)

df['target'] = data.target

X\_train, X\_test, Y\_train, Y\_test = train\_test\_split(df[data.feature\_names], df['target'], random\_state=0)

# Step 1: Import the model you want to use

# This was already imported earlier in the notebook so commenting out

# from sklearn.tree import DecisionTreeClassifier

# Step 2: Make an instance of the Model

clf = DecisionTreeClassifier(max\_depth=2,

random\_state=0)

# Step 3: Train the model on the data

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

# Step 4: Predict labels of unseen (test) data

# Not doing this step in the tutorial

clf.predict(X\_test)

# tree.plot\_tree(clf);

fn = ['sepal length (cm)', 'sepal width (cm)', 'petal length (cm)', 'petal width (cm)']

cn = ['setosa', 'versicolor', 'virginica']

# fig, axes = plt.subplots(nrows=1, ncols=1, figsize=(4, 4), dpi=300)

tree.plot\_tree(clf,

feature\_names=fn,

class\_names=cn,

filled=True

)

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

print("Train data accuracy:",accuracy\_score(y\_true = Y\_train, y\_pred=clf.predict(X\_train)))

print("Test data accuracy:",accuracy\_score(y\_true = Y\_test, y\_pred=y\_pred))

plt.show()

**Out put**

