**3. To construct the Decision tree using the training data sets under supervised learning concept.**

import pandas as pd

from sklearn.datasets import load\_iris

from sklearn.tree import DecisionTreeClassifier

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

from sklearn import tree

import matplotlib.pyplot as plt

# Load the Iris dataset

iris = load\_iris()

X = iris.data

y = iris.target

# Splitting 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)

# Initialize the DecisionTreeClassifier with the ID3 criterion (entropy)

clf = DecisionTreeClassifier(criterion='entropy', random\_state=42)

# Fit the model on the training data

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

# Predicting a new sample

# Let's assume a new sample with arbitrary measurements

new\_sample = [[5.1, 3.5, 1.4, 0.2]]

prediction = clf.predict(new\_sample)

print(f"Predicted class for the new sample: {iris.target\_names[prediction[0]]}")

# Plotting the decision tree

plt.figure(figsize=(20, 10))

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

plt.show()