import numpy as np

import pandas as pd

import matplotlib.pyplot as plt

from sklearn.tree import DecisionTreeClassifier, plot\_tree

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

from sklearn.metrics import accuracy\_score

from sklearn.datasets import load\_iris

# Load the Iris dataset directly from sklearn

iris = load\_iris()

# Convert to a pandas DataFrame for easier manipulation

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

# Add the target (species) to the DataFrame

data['species'] = iris.target

# Defining the features and target variable

X = data.drop('species', axis=1)

y = data['species']

# Splitting the data 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)

# Creating and training the Decision Tree model

clf = DecisionTreeClassifier()

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

# Making predictions on the test set

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

# Calculating accuracy

accuracy = accuracy\_score(y\_test, y\_pred)

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

# Visualizing the Decision Tree

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

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

plt.title("Decision Tree Visualization")

plt.show()