import numpy as np

import matplotlib.pyplot as plt

import pandas as pd

from sklearn.cluster import KMeans

from sklearn import datasets

print("All modules imported Successfully")

# Load the Iris dataset

iris = datasets.load\_iris()

X = iris.data  # Features (sepal length, sepal width, petal length, petal width)

target = iris.target  # Target labels

# Determine the number of clusters (K)

n\_clusters = 3

# Create a KMeans instance with the desired number of clusters

kmeans = KMeans(n\_clusters=n\_clusters, random\_state=42)

# Fit the KMeans model to the data

kmeans.fit(X)

# Get the cluster centers and labels

cluster\_centers = kmeans.cluster\_centers\_

cluster\_labels = kmeans.labels\_

# Plot the data points, coloring them by their true class labels

plt.figure(figsize=(10, 6))

for i in range(n\_clusters):

    plt.scatter(X[cluster\_labels == i][:, 0], X[cluster\_labels == i][:, 1], label=f'Cluster {i + 1}')

plt.scatter(cluster\_centers[:, 0], cluster\_centers[:, 1], c='red', marker='x', s=200, label='Cluster Centers')

plt.xlabel("Sepal Length (cm)")

plt.ylabel("Sepal Width (cm)")

plt.title("K-Means Clustering on Iris Dataset")

plt.legend()

plt.show()