AGGLOMERATIVE HIERARCHICAL CLUSTERING(4)

import matplotlib.pyplot as plt

from sklearn.datasets import load\_iris

from sklearn.cluster import AgglomerativeClustering

from sklearn.preprocessing import StandardScaler

from scipy.cluster.hierarchy import dendrogram, linkage

# Load the Iris dataset

iris = load\_iris()

X = iris.data # Features

# Standardize the features

scaler = StandardScaler()

X\_scaled = scaler.fit\_transform(X)

# Apply Agglomerative Clustering

agg\_clustering = AgglomerativeClustering(n\_clusters=3)

agg\_labels = agg\_clustering.fit\_predict(X\_scaled)

# Plot the dendrogram

linked = linkage(X\_scaled, method='ward')

plt.figure(figsize=(10, 7))

dendrogram(linked, orientation='top', distance\_sort='descending', show\_leaf\_counts=True)

plt.title('Dendrogram for Agglomerative Clustering')

plt.xlabel('Samples')

plt.ylabel('Distance')

plt.show()

# Plot the clusters (using 2D projection for visualization)

plt.figure(figsize=(10, 7))

plt.scatter(X\_scaled[:, 0], X\_scaled[:, 1], c=agg\_labels, cmap='rainbow')

plt.title('Agglomerative Clustering on Standardized Iris Dataset')

plt.xlabel('Standardized Feature 1 (Sepal Length)')

plt.ylabel('Standardized Feature 2 (Sepal Width)')

plt.colorbar(label='Cluster Label')

plt.show()