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from sklearn.cluster import KMeans
from sklearn.metrics import davies_bouldin_score

# Fit K-Means
kmeans = KMeans(n_clusters=4, random_state=42)
customer_profile['Cluster'] = kmeans.fit_predict(scaled_features)

# Calculate Davies-Bouldin Index
db_index = davies_bouldin_score(scaled_features, customer_profile['Cluster'])
print(f"Davies-Bouldin Index: {db_index}")

```

→ Davies-Bouldin Index: 0.7102764046737506

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from sklearn.decomposition import PCA

# Reduce dimensions for visualization
pca = PCA(n_components=2)
reduced_features = pca.fit_transform(scaled_features)

plt.figure(figsize=(8, 6))
sns.scatterplot(x=reduced_features[:, 0], y=reduced_features[:, 1], hue=customer_profile['Cluster'], palette='viridis')
plt.title("Customer Segmentation Clusters")
plt.xlabel("PCA Component 1")
plt.ylabel("PCA Component 2")
plt.show()

```

