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import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.cluster import KMeans
from sklearn.preprocessing import StandardScaler

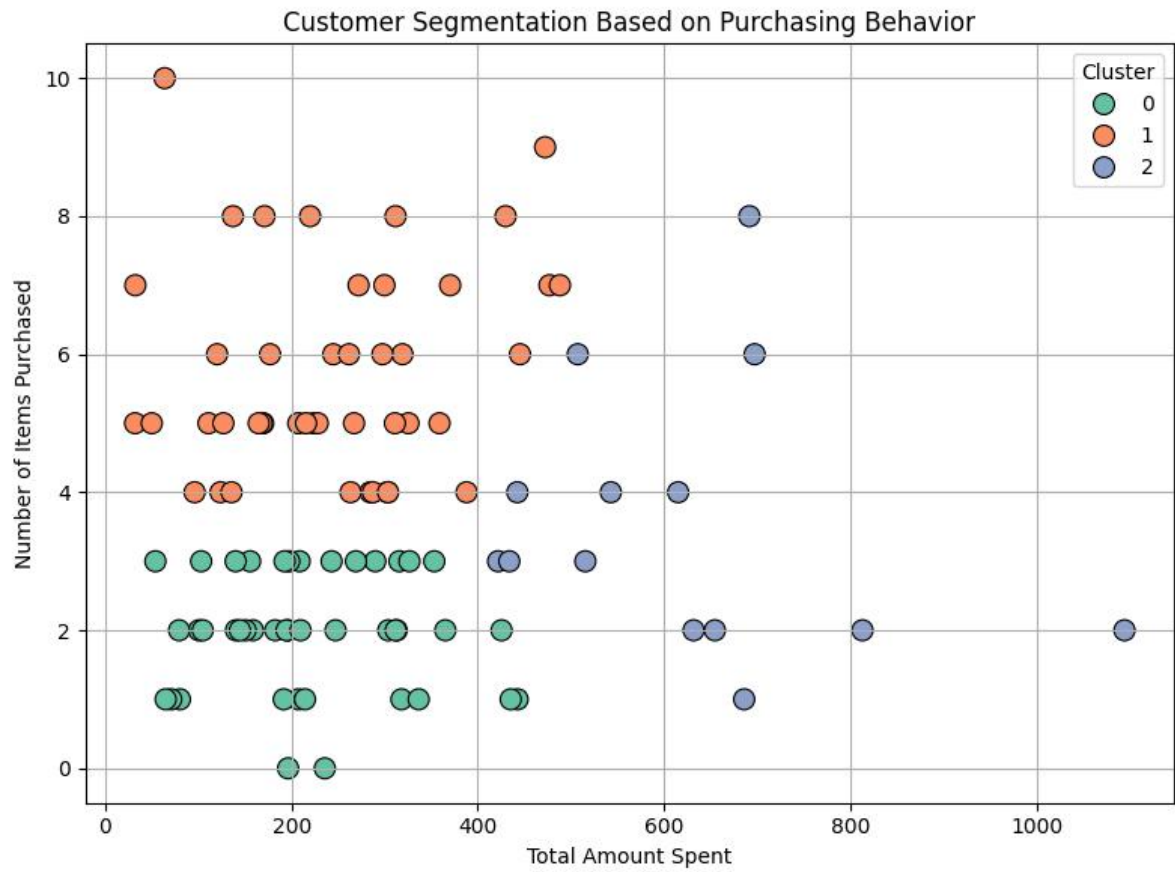
def customer_segmentation_kmeans(csv_file, n_clusters=3):
    try:
        df = pd.read_csv(csv_file)
    except FileNotFoundError:
        print("CSV file not found.")
        return
    except Exception as e:
        print(f"Error loading CSV: {e}")
        return
    if not {'CustomerID', 'TotalAmount', 'NumItems'}.issubset(df.columns):
        print("CSV must include 'CustomerID', 'TotalAmount', and 'NumItems' columns.")
        return
    X = df[['TotalAmount', 'NumItems']]
    scaler = StandardScaler()
    X_scaled = scaler.fit_transform(X)
    kmeans = KMeans(n_clusters=n_clusters, random_state=42)
    df['Cluster'] = kmeans.fit_predict(X_scaled)
    plt.figure(figsize=(8, 6))
    sns.scatterplot(
        x='TotalAmount', y='NumItems', hue='Cluster', data=df,
        palette='Set2', s=100, edgecolor='k'
    )
    plt.title('Customer Segmentation Based on Purchasing Behavior')
    plt.xlabel('Total Amount Spent')
    plt.ylabel('Number of Items Purchased')
    plt.grid(True)
    plt.tight_layout()
    plt.show()

    centers = scaler.inverse_transform(kmeans.cluster_centers_)
    print("\nCluster Centers (Original Scale):")
    for i, center in enumerate(centers):
        print(f"Cluster {i}: TotalAmount = {center[0]:.2f}, NumItems = {center[1]:.2f}")

customer_segmentation_kmeans(r'C:\Users\91637\OneDrive\Desktop\sev\transactions.csv')

```

OUTPUT



Cluster Centers (Original Scale):

Cluster 0: TotalAmount = 220.86, NumItems = 1.98

Cluster 1: TotalAmount = 244.57, NumItems = 5.77

Cluster 2: TotalAmount = 625.04, NumItems = 3.57