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import numpy as np

import pandas as pd

from sklearn\_extra.cluster import KMedoids

from sklearn.preprocessing import StandardScaler

import matplotlib.pyplot as plt

# Load the dataset

data = pd.read\_csv("customer\_spending\_scattered\_data.csv")

# Select the relevant features (Spending on Food and Spending on Clothing)

X = data[['Spending on Food', 'Spending on Clothing']]

# Optionally, standardize the data

scaler = StandardScaler()

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

# Define number of clusters

n\_clusters = 3

# Implement K-Medoids clustering

kmedoids = KMedoids(n\_clusters=n\_clusters, random\_state=42)

kmedoids.fit(X\_scaled)

# Get cluster labels and medoids

labels = kmedoids.labels\_

medoid\_indices = kmedoids.medoid\_indices\_

medoids = X\_scaled[medoid\_indices] # Get actual medoid values from scaled data

# Output results

print("Cluster labels:", labels)

print("Medoid indices:", medoid\_indices)

print("Medoid values:", medoids)

# Visualize clusters with grid lines

plt.figure(figsize=(8, 6))

plt.scatter(X\_scaled[:, 0], X\_scaled[:, 1], c=labels, cmap='viridis', marker='o')

plt.scatter(medoids[:, 0], medoids[:, 1], c='red', marker='X', s=200) # Medoids

plt.title('K-Medoids Clustering with Gridlines')

plt.xlabel('Spending on Food (Standardized)')

plt.ylabel('Spending on Clothing (Standardized)')

plt.grid(True) # Add gridlines

plt.legend(['Data Points', 'Medoids'])

plt.show()

