import pandas as pd

from sklearn.preprocessing import StandardScaler

from sklearn.cluster import KMeans

import matplotlib.pyplot as plt

data = {

    'Recency': [10, 200, 50, 30, 400, 5, 300, 100],

    'Frequency': [100, 10, 40, 60, 5, 150, 7, 30],

    'Monetary': [5000, 200, 1500, 3000, 100, 7000, 120, 900]

}

df = pd.DataFrame(data)

scaler = StandardScaler()

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

wcss = []

for k in range(1, 6):

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

    kmeans.fit(X\_scaled)

    wcss.append(kmeans.inertia\_)

plt.plot(range(1, 6), wcss, marker='o')

plt.xlabel("Number of clusters")

plt.ylabel("WCSS")

plt.title("Elbow Method")

plt.show()

kmeans = KMeans(n\_clusters=3, random\_state=42)

df['Cluster'] = kmeans.fit\_predict(X\_scaled)

print("\n📊 Customer Segments:")

print(df)

OUTPUT:

Customer Segments:

Recency Frequency Monetary Cluster

0 10 100 5000 1

1 200 10 200 2

2 50 40 1500 0

3 30 60 3000 0

4 400 5 100 2

5 5 150 7000 1

6 300 7 120 2

7 100 30 900 0

