import pandas as pd

import numpy as np

import matplotlib.pyplot as plt

from sklearn.cluster import KMeans

from sklearn.preprocessing import StandardScaler

data = {

    "CustomerID": [1, 2, 3, 4, 5, 6, 7, 8, 9, 10],

    "TotalAmountSpent": [500, 1500, 200, 3000, 2500, 800, 1200, 4000, 100, 700],

    "ItemsPurchased": [5, 15, 2, 30, 25, 8, 12, 40, 1, 7]

}

df = pd.DataFrame(data)

X = df[["TotalAmountSpent", "ItemsPurchased"]]

scaler = StandardScaler()

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

kmeans = KMeans(n\_clusters=3, random\_state=42, n\_init=10)

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

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

plt.scatter(df["TotalAmountSpent"], df["ItemsPurchased"],

            c=df["Cluster"], cmap="viridis", s=100, edgecolors="k")

centers = scaler.inverse\_transform(kmeans.cluster\_centers\_)

plt.scatter(centers[:,0], centers[:,1], c="red", s=200, marker="X", label="Centers")

plt.xlabel("Total Amount Spent")

plt.ylabel("Items Purchased")

plt.title("Customer Segmentation using K-Means")

plt.legend()

plt.show()

print("Clustered Data:")

print(df)

OUTPUT:

Clustered Data:

CustomerID TotalAmountSpent ItemsPurchased Cluster

0 1 500 5 1

1 2 1500 15 2

2 3 200 2 1

3 4 3000 30 0

4 5 2500 25 0

5 6 800 8 1

6 7 1200 12 2

7 8 4000 40 0

8 9 100 1 1

9 10 700 7 1

