# TAMIZHAN SKILLS

## PROJECT:

Customer Segmentation Using K-Means

## PROBLEM STATEMENT:

Businesses need to target different customers differently based on behavior.

## OBJECTIVE:

Cluster customers into groups using unsupervised learning.

## REQUIREMENTS:

- Use K-Means clustering on data (age, income, frequency, spending)
- Preprocess data using scaling
- Visualize clusters using 2D or 3D scatter plots

# Key Insights from Customer Segmentation Code

## ➢ Customer Grouping (Segmentation)

- The K-Means algorithm divides customers into *distinct clusters* based on behaviour and demographics.
- Each customer is assigned a *cluster label*(e.g Cluster0,Cluster 1, etc), representing their group.

## ➢ Cluster Profiles(Customer types)

df_clean.groupby('cluster')[['age', 'income', 'purchase_frequency', 'spending_score', 'avg_purchase_value']].mean()

This tells:

Cluster 0 = Young, frequent shoppers, but small spending
Cluster 1 = Older, high income, shop rarely but spend big
Cluster 2 = Mid-age, medium frequency and spending — ideal customers

We can identify *budget shoppers, Premium buyers, Occasional visitors,etc.*

## ➢ Behavioral Patterns

Using purchase_frequency, spending_score, and avg_purchase_value, we can:

- Find **loyal but low-value customers**
- Spot **big spenders** who shop less often
- Discover **young customers who buy often** but spend little

## ➢ Marketing Strategy per Cluster

Once you know what each cluster represents, we can tailor your marketing:

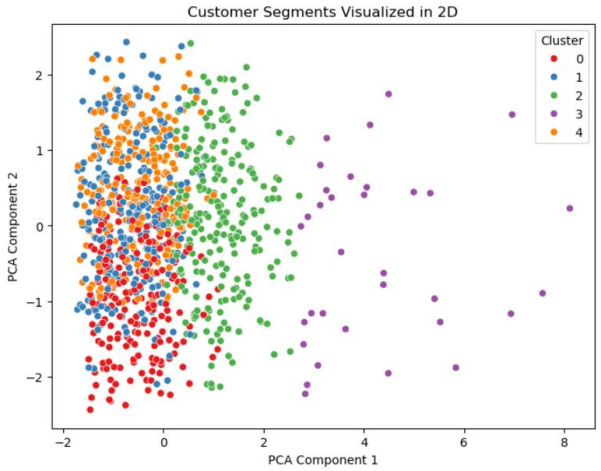
| Cluster Type | Marketing Strategy |
|---|---|
| High income, low frequency | Loyalty offers, big purchase incentives |
| Low income, high frequency | Bundle deals, discounts on essentials |
| High frequency & high spend | VIP programs, early access to new products |
| Low spenders | Target with budget items or flash sales |

## ➢ Operational & Strategic Insights

- **Inventory**: Stock more of what high-value clusters prefer
- **Retention**: Focus on retaining your best clusters
- **Acquisition**: Look for new customers that match your best cluster profiles

## ➢ Visual Insights

- The 2D *PCA Scatter plot* helps you *see how well the clusters are separated*
- We can visually:
  - ✓ Tight vs scattered clusters (strong vs weak patterns)
  - ✓ Overlapping segments (possibly needs more/different features)




## SUMMARY

This project lets you **move from general marketing to personalized targeting** by:

- Understanding **who your customers are**
- Designing **specific offers for each group**
- Making **data-driven decisions** on customer engagement