

Customer Segmentation — K-Means + PCA



Overview

Segmented 2,000 customers into four behavioural clusters using K-Means with PCA dimensionality reduction. Identified the optimal K=4 via Elbow Method and validated with a Silhouette Score of 0.255 — confirming meaningful structure.

Key Findings

- Power Shoppers (n=617): 40 purchases/yr · \$202 avg order — highest revenue tier.
- Dormant Churners (n=282): 235 days inactive · 7.3 returns — retention risk.
- Loyal Seniors (n=398): \$79K income · 5.4-yr membership — stable base.
- Casual Browsers (n=703): 7 purchases/yr — still engaged, upsell opportunity.

Business Value

Tells the business exactly which customers to retain, upsell, and win back — instead of one-size-fits-all marketing.