

CREDIT CARD CUSTOMER SEGMENTATION

Project Description

Credit Card Customer Segmentation using KMeans

Performed customer segmentation on the data using KMeans clustering. Conducted exploratory data analysis including missing value treatment, skewness analysis, correlation analysis, and feature standardization. I replaced the missing values with median imputation. I standardized all numeric features using StandardScaler to ensure that variables with large ranges like credit limit and balance did not dominate distance-based clustering. PCA was applied after standardization to avoid scale bias since PCA is variance-based. 90% explained variance was chosen as it preserves most information while reducing dimensionality and noise. Identified optimal clusters using Elbow and Silhouette methods. Trained the model using KMeans clustering. Derived actionable customer segments for marketing and risk analysis.

Project Implementation

1. Data collection- kaggle dataset

2. Data preprocessing

- ❖ Handle missing values
- ❖ Drop Cust_ID
- ❖ Scale data using StandardScaler

Clustering Model

KMeans Clustering

1. Choose optimal K using:

- Elbow method
- Silhouette score

2. Cluster Interpretation & Naming

3. Cluster Profiling

Segment Interpretation

Cluster	Cluster Name	Business Insight
Cluster 0	Low Engagement Customers	Low purchase volume, infrequent transactions, and occasional cash advances.
Cluster 1	Cash Advance Dependent Customers	high cash advance usage, higher balances, and moderate spending behavior..
Cluster 2	Active Digital Shoppers	Low Balance, High one-off purchase, Low cash_advance,
Cluster 3	High spender Premium User	very high purchase amounts, frequent transactions, high credit limits, and strong repayment behavior

- ❖ **Cluster 0** Low Engagement Customers – occasional users with minimal transactions.
- ❖ **Cluster 1:** Cash Advance Dependent Customers – regular users with balanced usage.
- ❖ **Cluster 2:** Active Digital Shoppers – frequent one-off transactions, minimal cash usage.
- ❖ **Cluster 3:** High spender Premium User with high purchase amounts and installment payments.

Business Action:

This project supports data-driven decision making.

Cluster 0

- ❖ Educational campaigns
- ❖ Activate usage with offer,cashback

Cluster 1

- ❖ Promote purchase-based alternatives instead of cash withdrawals
- ❖ Offer reduced cash advance fees with conditions
- ❖ Regular risk alerts

Cluster 2

- ❖ Merchant offers & cashbacks
- ❖ Credit limit enhancement
- ❖ Reward points

Cluster 3

- ❖ Retention & loyalty programs
- ❖ Personalized relationship management