

CREDIT CARD CUSTOMER SEGMENTATION

Project Description

Credit Card Customer Segmentation using BIRCH

Performed customer segmentation on the data using multiple clustering algorithm like KMeans, Agglomerative,BIRCH, DBSCAN, Meanshift, Spectral clustering,Affinity Propogation,. Conducted exploratory data analysis including missing value treatment, skewness analysis, correlation analysis, and feature scaling. I performed feature selection on the original features.I standardized all numeric features using RobustScaler to ensure that features with large scales like credit limit and balance did not dominate distance-based clustering. Identified optimal clustering algorithm using Silhouette scores.Trained the model using BIRCH 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 RobustScalar

Clustering Model

BIRCH Clustering

1.Choose optimal K using:

- Silhouette score

2.Cluster Interpretation & Naming

3. Cluster Profiling

Segment Interpretation

Cluster	Cluster Name	Business Insight
Cluster 0	Low spenders	Low Balance, Low purchase volume, Low payment, and Low credit limit.
Cluster 1	Premium High-Value Customers	High balance, Very high purchase, very high payments, very high credit limit.
Cluster 2	Cash Advance—Dependent Customers	High cash advance usage, higher balances, Low Purchase.

- ❖ **Cluster 0** Low Engagement Customers – occasional users with minimal transactions.
- ❖ **Cluster 1:** High spender Premium User with high purchase amounts and installment payments.
- ❖ **Cluster 2:** Cash Advance Dependent Customers – regular users with balanced usage.

Business Action:

This project supports data-driven decision making.

Cluster 0

Upsell entry-level offers, cashback incentives

Cluster 1

- ❖ Retention & loyalty programs
- ❖ Personalized relationship management

Cluster 2

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