

Customer Segmentation Using Clustering

Objective:

You are required to develop a customer segmentation model for a bank's credit card holders. The goal is to segment customers based on their transaction and credit usage patterns, allowing the bank to tailor marketing strategies for each segment more effectively.

Steps:

1. **Data Preprocessing:**
 - Handle missing values.
 - Apply feature scaling and any necessary feature engineering.
2. **Exploratory Data Analysis (EDA):**
 - Conduct thorough EDA, including data visualizations and key insights.
3. **Clustering:**
 - Apply at least two clustering algorithms (e.g., K-Means, DBSCAN).
 - Evaluate the quality of clusters using relevant metrics (e.g., silhouette score).
 - Determine the optimal number of clusters.
4. **Cluster Profiling:**
 - Provide detailed descriptions of each segment.
 - Propose marketing strategies for each segment.
5. **Deliverables:**
 - A Jupyter Notebook or Python script with:
 - Data preprocessing steps
 - EDA
 - Clustering analysis
 - Cluster profiling and marketing recommendations
 - A 5-minute video explaining your approach, reasoning, and key findings.
6. **Optional (Bonus):**
 - Apply Principal Component Analysis (PCA) or other dimensionality reduction techniques before clustering and assess its impact.