Customer Segmentation Analysis Report

1. Introduction This report presents a detailed analysis of customer segmentation based on data extracted from an **Airline Loyalty Program**. The goal of this project is to categorize customers into meaningful groups using **K-Means clustering**, which enables businesses to tailor marketing strategies, improve customer retention, and optimize service offerings.

2. Dataset Overview The dataset consists of various customer attributes, including:

- **Customer Lifetime Value (CLV)**
- **Salary**
- **Loyalty Card Type**
- **Marital Status**

The dataset was analyzed to uncover key patterns and insights that help in segmenting customers effectively.

3. Data Preprocessing & Cleaning

- Identified and handled **missing values**.
- Detected and treated **outliers**, especially in the salary distribution.
- Encoded categorical variables to facilitate numerical analysis.
- Standardized numerical features for clustering.

4. Exploratory Data Analysis (EDA) Key insights from the dataset were derived using **data visualizations**:

- **Gender and Marital Status Distribution**: Helped identify customer demographics.
- **Loyalty Card Type Analysis**: Showed customer preferences for loyalty programs.
- **Salary Distribution**: Identified income patterns and outliers.
- **Correlation Heatmap**: Analyzed relationships between different variables.

5. Clustering Methodology

- **Feature Selection**: Chose **CLV** and **Salary** for clustering.
- **Standardization**: Scaled numerical values using **StandardScaler**.
- **Elbow Method**: Determined the optimal number of clusters (**K=3**).

- **K-Means Clustering**: Implemented the algorithm to segment customers.

6. Results & Customer Segments The analysis grouped customers into three clusters:

- **Cluster 0 (Low CLV & Salary)**: Budget-conscious customers with lower spending.
- **Cluster 1 (Mid-range CLV & Salary)**: Regular customers with moderate spending habits.
- **Cluster 2 (High CLV & Salary)**: Premium customers with high spending potential.

7. Business Implications & Recommendations

- **Cluster 0**: Introduce discounts and cost-effective loyalty programs to attract and retain customers.
- **Cluster 1**: Engage through personalized offers and loyalty rewards to encourage repeat purchases.
- **Cluster 2**: Provide exclusive services, VIP benefits, and premium customer support to maximize retention.

8. Conclusion & Future Work Customer segmentation plays a crucial role in business decision-making. This analysis provides valuable insights into customer behaviors and helps companies strategize targeted marketing. Future work could involve:

- Incorporating **purchase behavior** for deeper segmentation.
- Applying **predictive models** for customer churn analysis.
- Using **advanced clustering techniques** like Hierarchical or DBSCAN for further refinement.

Prepared by: Sano Bangaly
GitHub: Bangaly-DS
LinkedIn: Sano Bangaly