Customer Segmentation Analysis Report

1. Introduction

1.1 Problem Statement

Customer segmentation is crucial for businesses to understand different customer groups and tailor marketing strategies accordingly. The objective of this analysis is to segment customers based on their demographics, spending behavior, and other relevant features using clustering techniques.

1.2 Objectives

- Identify customer segments based on available demographic and behavioral data.
- Understand spending behavior and its relationship with other features such as age, work experience, and family size.
- Provide business insights for personalized marketing strategies.

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2. Dataset Overview

2.1 The dataset was obtained from Kaggle.com

2.2 The dataset consists of various customer attributes, including:

- **Gender**: Male/Female

- **Ever Married**: Yes/No

- **Age**: Numeric

- **Graduated**: Yes/No

- **Profession**: Various professions

- **Work Experience**: Numeric

- **Spending Score**: Low/Medium/High

- **Family Size**: Numeric

- **Var_1**: Categorical variable

- **Segmentation**: Target label (A, B, C, D)

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3. Data Preprocessing

3.1 Handling Missing Values

- Missing values in "Work Experience" and "Family Size" were imputed using median values.

- Categorical variables were encoded into numerical format.

3.2 Feature Selection

The segmentation was based on these Key features:

- **Age vs. Spending Score**

- **Work Experience vs. Spending Score**

- **Family Size vs. Spending Score**

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4. Clustering Analysis (K-Means Algorithm)

- The optimal number of clusters was determined using the **Elbow Method**.

- Clustering was performed using **Age, Work Experience, and Family Size** against Spending Score.

4.1 Interpretation of Clusters

Cluster 0: Customers with low spending scores, often older or with larger families.

Cluster 1: Customers with moderate spending scores, usually mid-aged professionals.

Cluster 2: High-spending young customers, possibly early-career professionals.

Cluster 3: Mixed spending behavior, showing variability in demographics.

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5. Key Insights & Visual Analysis

5.1 Customer Segments (Age vs. Spending Score)

- Young customers (age 20-40) have varied spending behaviors, including high and low spending.

- Older customers (above 60) mostly fall in low spending categories.

- Middle-aged customers show a mixed spending pattern but with lower spending variance.

5.2 Customer Segments (Work Experience vs. Spending Score)

- Customers with **0-2 years of work experience** show diverse spending habits, with some spending highly and others conservatively.

- Customers with **6+ years of work experience** tend to have more stable spending behavior.

- High spenders exist across different work experience levels, suggesting spending is not solely dependent on work experience.

5.3 Customer Segments (Family Size vs. Spending Score)

- Small families (1-3 members) exhibit **high spending scores**.

- Larger families (4-9 members) tend to have **lower spending scores**.

- This indicates that customers with smaller families have more disposable income for spending.

6. Business Recommendations

1. **Target Young Customers with Personalized Offers**

   - Since younger individuals (20-40) exhibit high spending potential, businesses should design **exclusive discounts, loyalty programs, and premium memberships** to encourage repeat purchases.

   - Implement **AI-driven personalized marketing** to recommend products/services based on their spending behavior.

2. **Create Budget-Friendly Bundles for Large Families**

   - Customers with **larger family sizes (4-9 members)** tend to be conservative spenders.

   - Introduce **value packs, bulk purchase discounts, or family subscription plans** to attract and retain this segment.

3. **Develop Specialized Promotions for Low Work Experience Customers**

   - Customers with **0-2 years of work experience** have diverse spending habits.

   - Offer **installment-based payments, student-friendly discounts, or career-starter plans** to encourage spending.

4. **Focus on Financially Stable Middle-Aged Customers**

   - Middle-aged individuals have **steady but varied spending patterns**.

   - Provide **installment-based offers, premium loyalty programs, or credit-based incentives** to increase engagement.

5. **Investigate and Address Outliers for Unique Marketing Opportunities**

   - The **red dots (outliers)** suggest that some customers have unusual spending habits.

   - Use **customer surveys, transactional history analysis, or direct engagement** to understand their needs and design tailored offers.

6. **Implement Behavioral Analytics for Data-Driven Decisions**

   - Businesses should continuously **track and analyze customer spending trends** using **AI and machine learning**.

   - This will help predict **high-value customers, potential churn risks, and seasonal spending habits** for better marketing strategies.

7. Conclusion

This analysis provides valuable insights into customer behavior based on demographic and spending attributes. By using clustering techniques, businesses can optimize their marketing strategies and enhance customer engagement effectively. Further analysis incorporating income data (if available) could improve segmentation accuracy.

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