Presentation Title:

Customer Segmentation

Presentation Outline

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1. Title

Title: Customer Segmentation with Machine Learning
Subtitle: Unlocking Insights to Drive Targeted Marketing
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Date: 10-8-2025

2. Project Objective

- Segment customers based on purchasing behavior

- Identify distinct groups for personalized marketing

- Improve customer retention and lifetime value

3. Dataset Overview

- Source: Mall Customer Dataset

- Key features:

    - Age, Annual Income, Spending Score

- ~200–1000 customer records

4. Data Exploration

- df.info()

- df.shape

- df.nunique()

- df.dtypes

- df.columns

- df.describe()

- Age ditstribution - Younger customers tend to have higher spending scores

- Income doesn't always correlate with spending

  Visual: Scatter plot of Annual Income vs Spending Score

   Box plot of Annual Income

5. Data Cleaning

- Handled missing values

- Checked for duplicates

- Encode categorical variables using Label Encoder

- Scaled features using Standard Scaler

- Removed outliers using IQR or Z-score

- Selected relevant features for clustering

  Visual: Boxplots plots of selected features

Descriptive Statistics

  . Mean

  . Standard Deviation

 Visual: Visualize with correlation Matrix

6. Choosing the Clustering Algorithm

- Algorithm: K-Means Clustering

- Why K-Means?

- o Simple and efficient

- o Works well with numerical data

7. Finding Optimal Number of Clusters

- Optimal K = 3

- Silhouette_Score

8. Visualizing Clustering Results

- Cluster 0: Young, low spending, Moderate Spender Customer

- Cluster 1: High income, high spending Customers

- Cluster 2: Older, moderate income, low spender Customers

  Visual: Scatter plot with color-coded segments

9. Business Impact

- Personalized campaigns increased engagement

- Better allocation of marketing budget

- Higher conversion rates and customer satisfaction

  Visual: Bar chart showing campaign performance by segment

11. Group by segment to analyze behavior

  .   Segment Summary by Age, Annual Income, and Spending Score

12. Segment Profiles

Segment Description and Market Strategy

We analyzed customer data based on Age, Annual Income, and Spending Score. The results reveal three distinct customer segments, each with unique behaviors and marketing needs.

👥 Segment 0: Young, Low-Income, Moderate Spenders

•   Summary: : This group is mostly younger customers with lower income levels. Their spending score is slightly above average, meaning they do spend—but cautiously.

•   Insightful Interpretation: They may be students or early-career professionals who are budget-conscious but still responsive to good deals.

•   Recommendation: Offer affordable products, loyalty rewards,Use social media campaigns and student discounts to boost engagement, also to build long-term relationships .

💸 Segment 1: High-Income, High-Spending Customers

•   Summary: These are affluent customers who spend generously. They're younger than average and highly engaged.

•   Insightful Interpretation: This is your premium segment—likely professionals or trend-conscious shoppers who value quality and experience.

•   Recommendation: Target them with exclusive offers, premium products, and personalized experiences services. They're ideal for upselling and VIP programs.

👵 Segment 2: Older, Moderate-Income, Low Spenders

• Summary: This group is older, with average income, but they tend to spend less than others

• Insightful Interpretation: They may be retirees or conservative shoppers who prioritize value and reliability over trends

. Recommendation: Focus on trust-building, Introduce value bundles discounts, and informative content or loyalty perks to increase basket size,. Avoid aggressive sales tactics—these customers respond better to clarity and consistency.

12. Q&A

Let's discuss your questions, feedback, or ideas for next steps.
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