**Presentation Title:**

**Customer Segmentation**

**Presentation Outline**

**1. Title**

**Title**: Customer Segmentation with Machine Learning  
**Subtitle**: Unlocking Insights to Drive Targeted Marketing  
**Presented by**: Faleye Doyin Opeyemi  
**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?
  + Simple and efficient
  + 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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