Mall Customer Segmentation Analysis

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Understanding --
-Customer---
---Behavior---

• Introduction

Objective

Welcome to the Mall Customer Segmentation Analysis presentation. In this analysis, we delve into understanding the diverse behaviors and preferences of mall customers to help the mall improve its marketing and service strategies.

Why Customer Segmentation?

In the competitive retail landscape, understanding your customers' distinct needs is essential. Customer segmentation allows us to group similar customers together, providing tailored experiences and boosting customer satisfaction.

Dataset

We have leveraged the "Mall_Customers.csv" dataset, which contains valuable information about customers' demographics and spending patterns.

What to Expect

Over the course of this presentation, we will walk you through our data analysis journey, from initial data exploration to segmentation results and actionable insights.
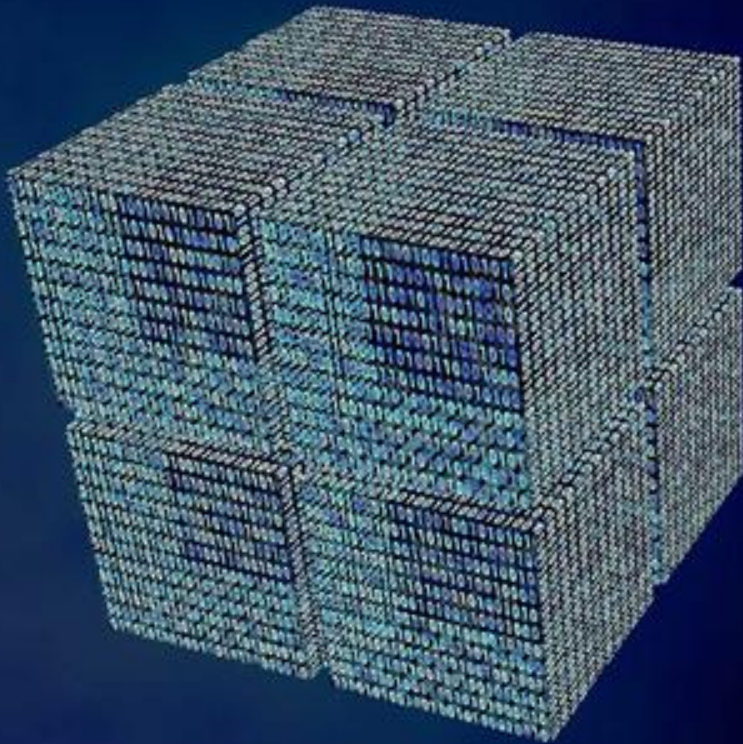
Dataset Overview

Data Source: The dataset used for this analysis is "Mall_Customers.csv," containing customer information collected from a mall.

Data Columns:

CustomerID: A unique identifier for each customer.

Genre: The customer's gender (Male or Female).

Age: The age of the customer.

Annual Income (k$): The annual income of the customer in thousands of dollars.

Spending Score (1-100): A score assigned based on the customer's spending behavior, ranging from 1 to 100.

Data Size: The dataset consists of [number of rows] rows and [number of columns] columns.

Data Quality: We have conducted data cleaning and preprocessing to handle missing values, outliers, and ensure data quality.

Data Exploration: Our analysis includes various data exploration techniques to gain insights into customer

Exploratory Data Analysis (EDA)

EDA Overview: Exploratory Data Analysis is a critical step to gain a deeper understanding of the dataset.

Key Insights:

  Gender Distribution: We analyzed the distribution of customers by gender to identify if there is any gender bias in the dataset.

  Age Distribution: We explored the age distribution to understand the age groups of customers.

  Income Distribution: Examining the distribution of annual income helped us identify income segments.

  Spending Score Distribution: We studied the distribution of spending scores to gauge customer spending behavior.

Visualizations: Our EDA process involved creating insightful visualizations like histograms, bar charts, and scatter plots to represent data patterns.

Correlation Analysis: We performed correlation analysis to understand the relationships between variables.

Data Quality: During EDA, we addressed missing values, outliers, and any anomalies in the dataset.

Findings: EDA revealed valuable insights that informed our subsequent segmentation analysis.

Customer Segmentation Methods

Customer Segmentation: The process of dividing customers into distinct groups based on specific characteristics for targeted marketing and personalized strategies.

Methods Used:

    Demographic Segmentation: Segments customers by demographic factors like age, gender, income, and occupation.

    Behavioral Segmentation: Segments customers by their purchasing behavior, brand loyalty, and spending patterns.

    Psychographic Segmentation: Groups customers by their lifestyle, values, and interests.

    Clustering Algorithms: Utilized clustering techniques such as K-Means, DBSCAN, and hierarchical clustering to group customers with similar attributes.

    Machine Learning Models: Employed machine learning models for predictive segmentation based on features like age, income, and spending score.

    RFM Analysis: Analyzed Recency, Frequency, and Monetary (RFM) metrics to classify customers into different categories.

    Geographic Segmentation: Considered the geographic location of customers to identify regional preferences and trends.

Benefits of Segmentation: Effective customer segmentation helps in:

    Tailoring marketing strategies.

    Enhancing customer experience.
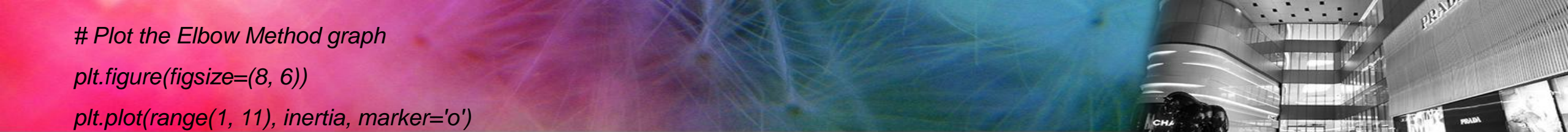
    Optimizing product recommendations.

    Maximizing revenue and customer retention.

Segmentation Approach: The segmentation method chosen for this analysis is detailed in subsequent slides.

CODE IN USE

```python
import pandas as pd

import matplotlib.pyplot as plt

from sklearn.cluster import KMeans

from sklearn.preprocessing import StandardScaler

# Load the data

data = pd.read_csv('Mall_Customers.csv')

# Select features for clustering (Age, Annual Income, Spending Score)

X = data[['Age', 'Annual Income (k$)', 'Spending Score (1-100)']]

# Standardize the features

scaler = StandardScaler()

X_scaled = scaler.fit_transform(X)

# Determine the optimal number of clusters using the Elbow Method

inertia = []

for k in range(1, 11):

    kmeans = KMeans(n_clusters=k, random_state=42)

    kmeans.fit(X_scaled)

    inertia.append(kmeans.inertia_)
```

```python
# Plot the Elbow Method graph
plt.figure(figsize=(8, 6))
plt.plot(range(1, 11), inertia, marker='o')
plt.title('Elbow Method')
plt.xlabel('Number of Clusters')
plt.ylabel('Inertia')
plt.show()
# Based on the graph, let's choose the number of clusters as 5
num_clusters = 5
# Perform K-Means clustering
kmeans = KMeans(n_clusters=num_clusters, random_state=42)
data['Cluster'] = kmeans.fit_predict(X_scaled)
# Visualize the clusters
plt.figure(figsize=(10, 6))
plt.scatter(data['Annual Income (k$)'], data['Spending Score (1-100)'], c=data['Cluster'], cmap='rainbow')
plt.xlabel('Annual Income (k$)')
plt.ylabel('Spending Score (1-100)')
plt.title('Customer Segmentation')
plt.show()
# Display the clustered data
print(data.head())
```

Acknowledgments

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Educational Platforms: Special thanks to online learning platforms, tutorials, and courses that equipped us with the necessary skills to complete this project

https://github.com/Sahil-Kumar0/Mall_Customers.git

THANK YOU

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