Mall Customers Clustering Project

1. Introduction

This project applies Machine Learning techniques to segment mall customers based on their shopping behavior and spending patterns. The clustering helps businesses understand customer groups and develop better marketing strategies.

2. Problem Statement

Businesses often struggle to target the right customers with suitable products and offers. By clustering customers based on attributes like annual income and spending score, malls can identify high-value customers and optimize marketing campaigns.

3. Objectives

- Segment mall customers into distinct groups using clustering techniques. - Visualize customer clusters for better interpretation. - Provide insights for targeted marketing and business growth.

4. Dataset

The dataset used is the Mall Customer Segmentation Data from Kaggle. It contains the following features: - CustomerID: Unique ID of each customer - Gender: Male/Female - Age: Age of the customer - Annual Income (k$): Income of the customer in thousands - Spending Score (1–100): Score assigned based on customer behavior and spending nature.

5. Methodology

Steps followed in the project: 1. Data loading and exploration. 2. Data preprocessing and visualization. 3. Applying K-Means clustering algorithm. 4. Finding optimal number of clusters using Elbow Method. 5. Visualizing customer clusters with scatter plots.

6. Results

The K-Means algorithm successfully segmented customers into distinct clusters. Visualizations demonstrated groups based on income and spending scores, helping identify high-spending and low-spending customers.

7. Conclusion

Customer clustering enables malls to create data-driven strategies. By identifying high-value customers, businesses can focus on retention and personalized offers, while also catering to budget-conscious customers.

8. Future Work

- Apply advanced clustering algorithms such as DBSCAN or Hierarchical Clustering. - Include additional features like shopping frequency and product preferences. - Develop a recommendation system for personalized offers.