Project Report: Airline Customer Segmentation

1. Introduction

Airline customer segmentation is crucial for understanding customer behavior and enhancing business strategies.
This project applies clustering techniques to categorize airline customers based on their travel and spending patterns.

2. Dataset Overview

- The dataset includes customer information such as flight frequency, distance traveled, loyalty status, and spending patterns.
- Key attributes: Customer ID, Age, Flight Miles, Loyalty Points, Spending Score, etc.

3. Data Preprocessing

- Handling missing values and outliers.
- Scaling numerical features for better clustering performance.
- Feature selection and dimensionality reduction using PCA.

4. Clustering Approach

- K-Means Clustering is used to segment customers into different groups.
- The Elbow Method determines the optimal number of clusters.
- Principal Component Analysis (PCA) is used for visualization.

5. Results & Insights

- Distinct customer groups identified: Frequent Travelers, Business Travelers, Budget Travelers, Luxury Travelers.
- Behavioral patterns and spending habits analyzed for each segment.
- Potential marketing strategies tailored to different segments.

6. Conclusion & Business Impact

- Segmentation enables airlines to optimize loyalty programs, personalized marketing, and customer engagement.
- Future enhancements may include advanced clustering techniques like DBSCAN or hierarchical clustering.

7. Technologies Used

- Python (Pandas, NumPy, Matplotlib, Seaborn, Scikit-Learn)
- Jupyter Notebook for analysis