**Executive Summary – Airline Customer Segmentation for Loyalty Strategy**

**Business Objective**

The goal of this project is to optimize airline loyalty programs by identifying distinct customer segments using behavioral data. By analyzing flight frequency, spending, recency, and engagement, we aim to uncover actionable customer groups for targeted retention, reward, and reactivation strategies.

**Approach & Methodology**

We used a structured data science pipeline involving:

* **Feature Engineering** based on the LRFMC model (Loyalty, Recency, Frequency, Monetary, Customer value).
* **Dimensionality Reduction** using Principal Component Analysis (PCA) to simplify multivariate relationships.
* **Clustering** with KMeans, optimized via Silhouette Score analysis (k=6).
* **Visualization** through scatter plots, pairplots, and radar charts to profile segment behaviors.

**Key Insights**

* **Six distinct customer segments** emerged, each reflecting unique patterns of travel frequency, monetary value, and loyalty.
* High-value clusters showed strong recency and frequency, making them ideal for premium loyalty offers.
* Dormant or low-engagement customers revealed opportunities for re-engagement campaigns.
* Price-sensitive flyers formed a separate group, indicating potential for discount-driven strategies.

**Top Predictive Features**

* **Frequency** (total number of flights)
* **Monetary** (total spend across loyalty years)
* **Recency** (days since last flight)
* **Loyalty Duration** (tenure in loyalty program)
* **Points** (engagement in loyalty activities)

**Recommendations**

* **Personalize marketing** for each segment: VIP perks for high-value clusters, discounts for price-sensitive users, re-engagement for dormant flyers.
* **Focus resources** on Clusters 1 and 5 (most profitable and loyal customers).
* **Launch win-back campaigns** for low-frequency, low-recency members (e.g., Cluster 3).
* **Design tiered loyalty programs** based on behavioral clusters rather than generic thresholds.

**Ethical Considerations**

* Ensure **transparency and fairness** in segmentation criteria.
* Avoid **biases** from demographic or socio-economic data.
* Use segmentation responsibly to **enhance customer experience**, not exploit purchasing behavior.