**Data Analysis Report**

Airline Loyalty Program Project

**Executive Summary**

This report analyzes the performance of the customer loyalty program using data from the “Customer Flight Activity” and “Customer Loyalty History” tables. Key insights include:

* 2018 overall monthly average of flights booked per member - 5.48
* 2018 total flights booked – 1,100,121
* Customer distribution by region - Significant concentrations in Ontario (32%), British Columbia (26%), and Quebec (19.7%)
* Promotional Period Impact – After the promotional period (Feb – April 2018), a substantial increase in total flights booked was observed, suggesting a positive response to promotional enrollments.
* Points Redemption Behavior – Despite substantial points accumulation, members redeemed, on average, $32 with a total redemption of $540,167 across the board, prompting further exploration into factors influencing redemption behavior.

**1. Introduction**

The purpose of this data analysis is to gain insights into the customer loyalty program’s performance based on two key tables: “Customer Flight Activity” and “Customer Loyalty History.” The analysis aims to understand customer behavior, identify trends, and inform strategic decisions to enhance the program’s effectiveness.

2. Data Collection

2.1 Tables Used

* + Customer Flight Activity
  + Customer Loyalty History

2.2 Data Sources

* + Maven Analytics “Airline Loyalty Program” sample dataset

2.3 Data Preparation

* + Concatenated all “Month” and “Year” columns into singular date columns in YYYY-MM-DD format using Microsoft Excel for streamlined importation into pgAdmin.
  + Formatted all columns for proper importation into pgAdmin.
  + Addressed negative values in the ‘Salary’ column of the “Customer Loyalty History” table.
    - Due to lack of contextual clarity and an inability to consult with stakeholders about the data, I assumed all negative values were potential data entry errors and adjusted them to positive values.
    - Average salary increased from $79,245.61 to $79,359.34 after corrections, increasing by $113.70, a fairly minor change given the dataset size.
  + Created tables in PgAdmin for each corresponding spreadsheet with the appropriate column names and addressed importation errors.
    - Edited the CSV files in Notepad++ to efficiently remove extra trailing commas resulting from the deletion of columns in the original spreadsheets.
    - Altered column data types in PgAdmin to ensure accurate VARCHAR limits.

3. Exploratory Data Analysis

3.1 SQL Demographic Analysis

* Utilized SQL queries to extract and analyze the distribution of members by province, city, marital status and education, and income.

3.2 Tableau Visualizations

* Monthly Flight Bookings – Created a bar graph illustrating monthly flight bookings along with a line chart showing monthly % differences, using a dual-axis visualization.
* Member Activity – Created a bar graph showcasing member activity over the months
* Enrollment Information – Developed a dashboard depicting new enrollments, cancellations, and net member gains per month as well as comparing promotional vs. standard enrollments and their impact on other aspects.
* Loyalty Points and Redemption – Developed a dashboard illustrating both the total and the average accumulation and redemption of points over the years.

4. Detailed Analysis and Results

4.1 Demographic Analysis

* + - Provinces
      * The majority of loyalty program members reside in **Ontario** (32%), **British Columbia** (26%), and **Quebec** (19.7%).
    - Cities
      * The highest percentage of loyalty program members reside in **Toronto** (20%), followed by **Vancouver** (15%) and **Montreal** (12%).
    - Marital Status and Education
      * The majority of loyalty program members are **married** **with Bachelor’s degrees** (42.5%).
      * **Married** loyalty members are **more likely to travel with companions** (51.6%), followed by **single members** (24%) and **divorced members** (13.4%).
    - Income
      * The majority of loyalty program members have salaries between **$50k and $75k** (34.2%) and **between $75k and $100k** (25.9%).

4.2 Flight Booking Patterns

* A total of 1,100,121 flights were booked in 2018, with a monthly average of 5.48 flights per member.
* Notable spikes in flight bookings occurred in July, June, August, and December.
* Solo flights consistently outnumbered accompanied flights, which only made up about 20% of total bookings.

4.3 Loyalty Points

* The Star loyalty card members led in flight bookings, thus they also led in loyalty point accumulation.
* Despite high point accumulation, each card tier redeemed only 24-25% of total points.
* Members accumulated an average of 1632 points in 2018, totaling 27,322,479 points, while the redemption amount was 399 on average per member, totaling 6,674,449 points redeemed.

4.4 Member Activity and Enrollment

* Member activity increased as the year progressed – January 2018 had 8,658 active members and 8,130 inactive members while December 2018 had 9,764 active members and 7,014 inactive members.
* A third of the total enrollments for 2018 were from the promotional enrollment period from February to April 2018, bringing in 856 new enrollments, with March and April recording the highest number of enrollments of the year.
* The average monthly net member gain was 224.3 per month in 2018, compared to 146.4 in 2017, with enrollment figures suggesting a heightened loyalty program interest throughout the year, even after the promotion period.

5. Discussion

5.1 Program Effectiveness

* The increase in enrollments and heightened member activity suggests a positive response to the loyalty program.
* The concentrated flight bookings during specific months provide an opportunity for targeted promotions or incentives to further increase member activity.

5.2 Loyalty Points Dynamics

* Despite members accumulating a high amount of points, the low redemption rate raises questions about the perceived worth of redemption options.
* Understanding member preferences and adjusting the redemption options could optimize the loyalty points structure for increased participation and points redemption.

6. Conclusion

In conclusion, this analysis sheds light on strengths and areas of improvement in the customer loyalty program. By delving into details like member demographics, flight booking trends, and the accumulation and redemption of loyalty points, it provides a foundation for informed, data-driven decision-making. Enhancing the program’s effectiveness requires strategic adjustments to better match customer preferences.

7. Recommendations

7.1 Marketing Strategies

* Tailor marketing efforts to focus heavily on regional concentrations in Ontario, British Columbia, and Quebec.
* Implement targeted promotions during peak months to boost engagement.

7.2 Loyalty Program Enhancement

* Review and adjust the loyalty points structure to increase the perceived value of redemption rewards, whether through changing conversion rates, adding more enticing redemption options, or adjusting other aspects.
* Introduce personalized incentives to encourage members to book flights with companions and increase member engagement.

8. Appendix

8.1 Technical References

* For the SQL code used to derive statistics, please reference the [GitHub repository](https://github.com/rachelle-norman/airline-loyalty-program-project/blob/main/sql-code.md) for this project.
* For the Tableau dashboards related to this project, please reference the [Tableau Public website](https://public.tableau.com/app/profile/rachelle.norman/viz/AirlineLoyaltyProgramProject/FlightLoyaltyProgramAComprehensiveLook?publish=yes).