

CANADA AIRLINE LOYALTY ACTIVITY ANALYSIS

NeuroTECH Academy

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Data Analysis Final Project Report: Methodology, Analysis, and Conclusions

A Comprehensive Examination and Findings

Introduction

This analysis report provides a detailed examination of the methodology employed, the core findings derived through analysis, and the conclusions drawn from the study. The report aims to ensure clarity, rigor, and traceability in all aspects of the research process.

Methodology






Research Design

The research utilized a **descriptive analysis** approach, highlighting qualities (**dimensions**) and quantities (**measures**) in the data to ensure robust and multifaceted insights. This approach was chosen to highlight, describe, and focus on the summary and presentation of the data.

The goal is to present the data in an orderly fashion and answer the question, “What happened?”.

Data Collection

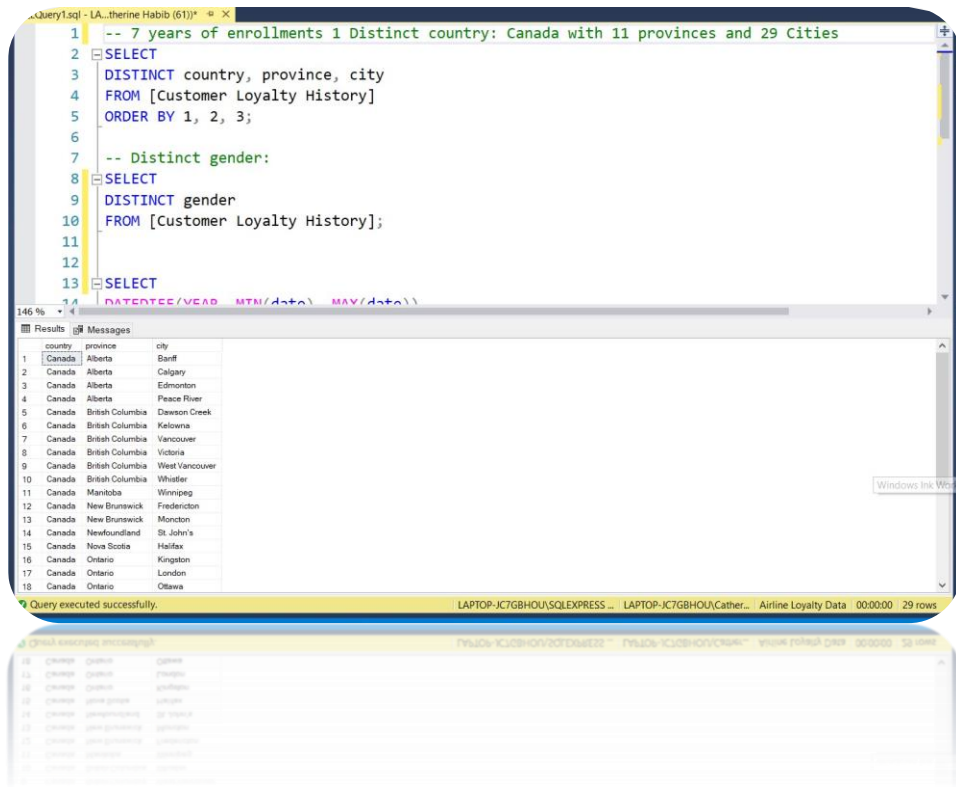
Used the provided dataset: **Airline Loyalty Data**.

 Airline Loyalty Data Dictionary.csv	1,349	577	XLS Worksheet	2/5/2024 1:32 AM	34D1A261
 Calendar.csv	115,117	7,234	XLS Worksheet	2/5/2024 1:32 AM	D3456A4D
 Customer Flight Activity.csv	11,073,106	2,428,249	XLS Worksheet	2/5/2024 1:32 AM	15F22328
 Customer Loyalty History.csv	1,733,749	284,015	XLS Worksheet	2/5/2024 1:32 AM	048AA4E0
 Customer Loyalty History.csv	1,733,749	284,015	XLS Worksheet	2/5/2024 1:32 AM	048AA4E0

Analysis

EDA

Used SQL queries to get distinct values and understand the data.



Example: Distinct data derived from table (Customer Loyalty History)



Data Cleaning and Preparation

Used Excel to clean, remove duplicates and prepare the data for further analysis and visualization.

Formatted data values in the **salary** field in table **Customer Loyalty History** from negative values to actual salary values.

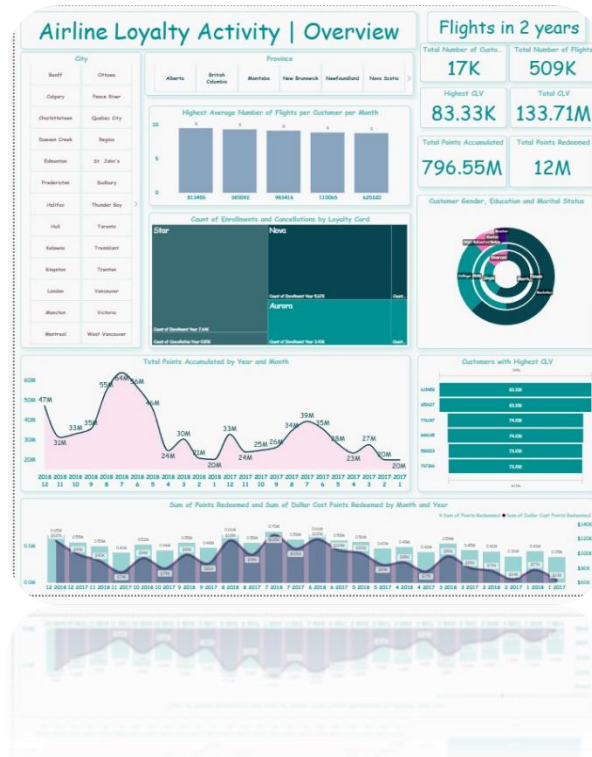
Province	City	Postal Code	Gender	Education	Salary	Marital Status	Loyalty Card	CVV	Enrollment Type	Enrollment Year	Enrollment Month	Cancellation Year	Cancellation Month
Quebec	Montreal	H3T 4M4	Male	High School	48500	Divorced	Star	24227.5	2018	Promotion	2018	3	
British Columbia	Vancouver	V6B 1N3	Female	Bachelor	15407	Married	Aurora	8420	2018	Promotion	2018	3	
British Columbia	Vancouver	V5C 4R6	Female	Bachelor	46803	Single	Star	4787.81	2018	Promotion	2018	3	
British Columbia	Vancouver	V7S 8T5	Male	Bachelor	45902	Married	Star	2402.35	2018	Promotion	2018	3	
British Columbia	West Vancouver	V8V 8T3	Female	Bachelor	15525	Single	Star	2893.74	2018	Promotion	2018	3	
British Columbia	Dawson Creek	X1A 0P1	Male	Bachelor	41234	Married	Star	7357.37	2018	Promotion	2018	3	
Newfoundland and Labrador	St. John's	A1C 6B9	Male	Bachelor	15003	Married	Star	5863.17	2018	Promotion	2018	4	
Newfoundland and Labrador	St. John's	A1C 6B9	Male	Bachelor	17324	Married	Star	40423.8	2018	Promotion	2018	3	
Ontario	Toronto	M1T 1B7	Female	Bachelor	15446	Married	Aurora	5002.24	2018	Promotion	2018	2	
Ontario	Southbury	M1V 1S6	Female	Bachelor	31011	Married	Star	2888.85	2018	Promotion	2018	2	
Ontario	Toronto	M2T 6G3	Male	Bachelor	48003	Married	Star	2130.68	2018	Promotion	2018	2	
Ontario	Freemont	K1V 4B2	Female	Bachelor	14079	Married	Star	12913.5	2018	Promotion	2018	2	
Ontario	Toronto	M1R 4C3	Female	Bachelor	3001	Married	Star	8513.75	2018	Promotion	2018	4	
Quebec	Montreal	H3T 1B8	Male	Bachelor	48479	Married	Star	4786.88	2018	Promotion	2018	4	2018
Quebec	Trenton	M1V 1S6	Female	Bachelor	26322	Single	Aurora	18710.84	2018	Promotion	2018	4	2018
Quebec	Hall	H1T 3E5	Female	Bachelor	47130	Married	Star	6365.25	2018	Promotion	2018	3	
Quebec	Quebec City	G1R 3L5	Male	Bachelor	38603	Married	Star	6446.71	2018	Promotion	2018	3	
Quebec	Quebec City	G1R 3L5	Female	Bachelor	18332	Divorced	Star	5358.76	2018	Promotion	2018	2	
Saskatchewan	Regina	S4S 3C5	Male	Bachelor	46303	Married	Star	11380.75	2018	Promotion	2018	4	
Yukon	Whitehorse	X1A 0P1	Male	Bachelor	10218.66	2018	Promotion	2018	4				

Removed 1,922 duplicates from table **Customer Flight Activity**.

Flight Number	Year	Month	Total Flights	Distance	Points Accumulated	Points Redeemed	Dollar Cost Points Redeemed
100590	2018	6	12	15276	22914	0	0
100590	2018	7	12	9168	13752	0	0
100590	2018	5	4	6504	9756	0	0
100590	2018	10	0	0	0	512	92
100590	2018	2	0	0	0	0	0
100590	2018	4	0	0	0	0	0
100590	2018	3	0	0	0	0	0
100590	2018	8	0	0	0	0	0
100590	2018	9	0	0	0	0	0
100590	2018	11	0	0	0	0	0
100590	2018	12	0	0	0	0	0
102376	2018	6	24	21216	0	0	0
102376	2018	12	15	16500	24750	556	100
102376	2018	7	12	25080	37620	0	0
102376	2018	8	12	6360	9540	0	0
102376	2018	9	6	7452	11178	0	0
102376	2018	5	4	2972	4458	0	0
102376	2018	2	0	0	0	0	0
102376	2018	3	0	0	0	0	0
102376	2018	4	0	0	0	0	0
102376	2018	10	0	0	0	0	0
102376	2018	11	0	0	0	0	0
102788	2018	7	20	24640	36960	0	0
102788	2018	5	16	27648	41472	0	0
102788	2018	8	16	28992	43488	0	0
102788	2018	12	15	28125	42187.5	0	0
102788	2018	9	6	8634	12951	0	0

Key Analytical Insights

Used Power BI to further clean the data, perform advanced data analysis and generate meaningful visualizations (charts identifying trends, patterns, and correlations within the dataset).



Questions that can be answered from this research:

1. What is the total number of customers?
2. What is the total number of flights?
3. What is the highest CLV?
4. Which customers have the highest CLV?
5. What is the average number of flights per customer?
6. Which customers have the highest average of flights per month?
7. Which customers have the highest average of flights per month per city?
8. Which customers have the highest average of flights per month per province?
9. What is the count and percentage of the customers per gender?
10. What is the count and percentage of the customers per education?
11. What is the count and percentage of the customers per marital status?
12. What is the total number of the accumulated points?
13. Which month has the highest accumulated points?
14. Which month has the least accumulated points?
15. Which year has the highest accumulated points?
16. What is the total number of redeemed points?
17. What is the value in dollars for the redeemed points per month?
18. What is the number of enrollments per loyalty card?
19. What is the number of cancelations per loyalty card?

Conclusions

Key Findings

- The airline of this dataset provides services to customers coming from only **1** Country which is **Canada** from **11** different Provinces and **29** different Cities in **Canada**.
- The dataset contains approximately **17K** customers enrolled in the airline services (exactly **16,737** customers).
- Most customers are **female** gender.
50.25% are **Female**.
49.75% are **Male**.
- There are **5** different degrees: The Majority have a **Bachelor's** degree.
62.59% have a **Bachelor's** degree.
25.32% have a **College** degree.
4.67% have a **High School** degree or **Below**.
4.39% have a **Doctor** degree.
3.04% have a **Master's** degree.
- There are **3** categories: The Majority are **Married**
58.16% are **Married**.
26.79% are **Single**.
15.04% are **Divorced**.
- There are **2** types of enrollments: **Standard** and **2018Promotion**.
- There are **3** types of Loyalty Cards: The Majority have a **Star** Card
7,637 are enrolled in a **Star** Card, **901** of which were cancelled.
5,671 are enrolled in a **Nova** Card, **717** of which were cancelled.
3,429 are enrolled in an **Aurora** Card, **449** of which were cancelled.
All enrollments were between **2012** and **2018**
&
All cancellations were between **2013** and **2018**.

- The Total of all CLVs measures approximately **133.71M**.
- Customers with the highest CLVs: **615459** and **652627**.
- All flights in this dataset were only in **2** years **2017** and **2018**.
- The dataset contains approximately **509K** recorded flights (exactly **508,808** flights).
- The total number of flights per customer ranges from **0** to **28** flights per month.
- The average number of flights per customer ranges from **0** to **9** flights per month.
- Most travelling customers: **813455** and **385092**.
- The Highest Numbers of Points Accumulated were in July of each of both years **2017** and **2018** with approximately **39M** and **64M**, respectively.
2018 has the higher numbers of accumulated points.
- The total of the points accumulated in both years is approximately **796.55M**.
- The total of the points redeemed in both years is approximately **12M**.
- The highest value of dollar cost points redeemed in **July 2018** with value **125,280\$**.