Scene Presentation

Team New York

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SCENE™

Executive Summary

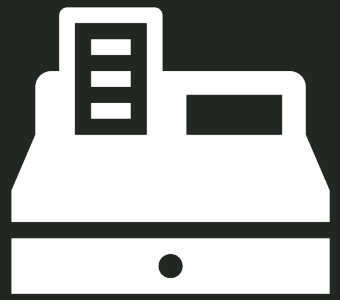
Our Understanding

Based on SCENE and CINEPLEX business questions we focused on

Who are Cineplex/Scene's Current Customer

Average Spend, Frequency, Age, Point Transaction

What Are They Purchasing Today?



Top Purchases, Product Associations, Content Preferences

How Can We Maximize their Value to Cineplex

Post-Covid Plan, Subscription Offering, Bundles, Loyalty Program

Our Recommendations

Reopening
3-6 months

Focus on the Core

1. Gain trust and re-establish customer behaviours
2. Leverage online store and experience to restart revenue stream

New Normal
6-18 months

Create Segment Specific Offerings

3. Offer a Subscription Plan
4. Value-Add Packages built to price points

Future State
18+ Months

Grow Secondary Segments Using Cineplex Ecosystem

6. Increase Engagement of Loyalty Program
7. SCENE Bundling across CINEPLEX Owned facilities (Rec room, Top Golf, Playdium)
8. Partner with more Dining Venues

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Our Process

1

Data Pre-Processing & Feature Engineering

- Primary dataset was created by aggregating the transaction dataset and customer details
- Data cleaned for data types, outliers, missing values, skewedness

2

Feature Selection

- Final feature selection utilized an RFM methodology

Features Included:

- Recency
- # of Cineplex Transactions
- Scene Point Burn Rate
- Average Cineplex Spend

3

Model Selection & Optimization

- Models were optimized, and resultant measures/summary statistics were compared. K-means was selected as our model.

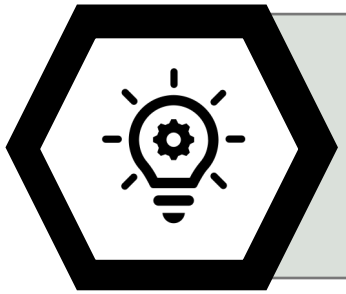
Models Tested

- K-means, DBSCAN and Hierarchical

4

Map Clusters Back to Individual Transactions

- Clusters labels were appended to the existing datasets and mapped back to transactional data



Analyze Cluster Profiles

5

- Descriptive analytics was performed on clusters and association rules for transactions were created.
- Clusters profiles were mapped back to existing Scene customer segments were applicable.

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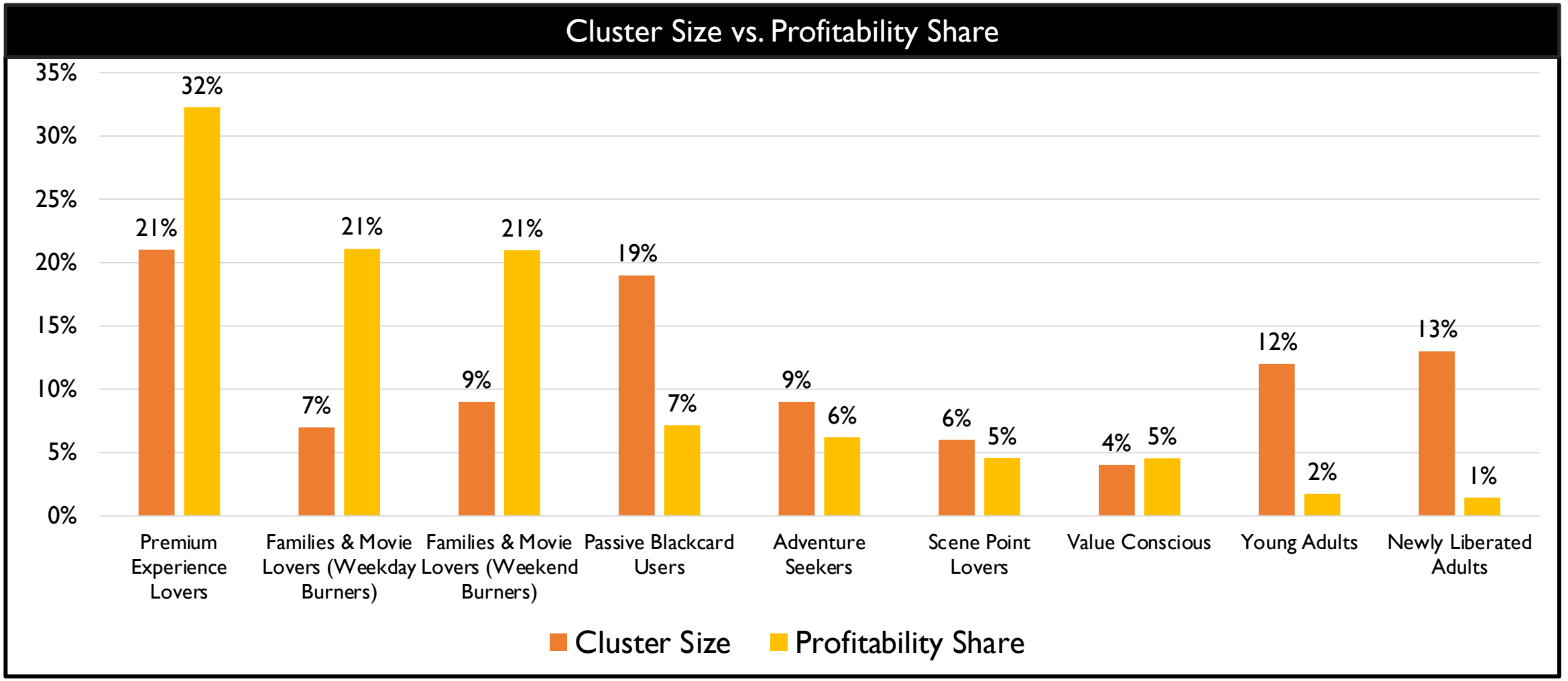
9 Major Clusters With Unique Behaviours Were Identified



A conversion of 100 points = $1 was used to convert SCENE points into dollars. Profitability = (Cineplex Revenue) – (Cost of SCENE Points Burned)

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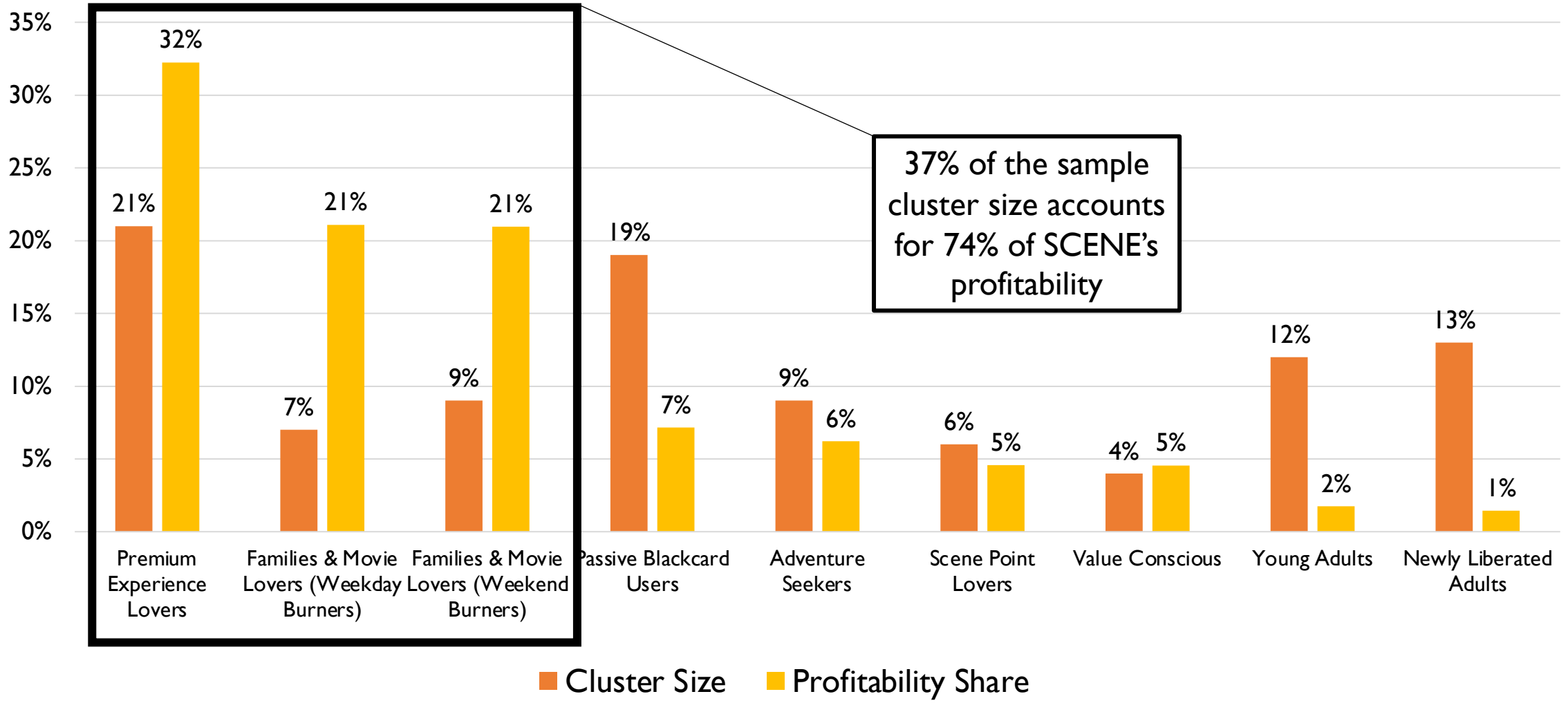
Reopening Phase: Focus on the Core

The Majority of Profits Are Coming From 3 Main Clusters



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Gold Customer – Cinema Lovers

Top Purchases
Premium Tickets & Child Tickets Among Top Purchases

High Frequency
9 – 42 transactions

High Concession
Tendency 50%

High Online
Purchasers

Earners & Redeemers

Family

Movie Lovers

23-44
Age

$527
Total Cineplex Spend Per Person/Year

16%
Size

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Silver Customer – Casual Cinephiles

Top Purchases
Premium Adult Tickets & Cara Among Top Purchases

Medium Frequency
4 – 16 transactions

Medium Concession
Tendency 38%

Low Online
Purchasers

Earners

Premium Experience Lovers

25-47
Age

$304
Total Cineplex Spend Per Person/Year

21%
Size

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How to Maintain the Core

Health First Approach

Designed with these clusters in mind. If their first touchpoint is positive than they will continue to show up

Family Bundles

Encourage profitable behaviours with offerings focused to these groups

Content That Appeals To The Core

Family and "maybe you missed it blockbusters"

Stagger Movie Times

Target families earlier in the evening and younger professional (premium experience go-ers) later in the evening

Look Into Innovative New Experiences

New experiences like drive-in movies in the parking lot of Cineplex that might appeal to these segments and provide additional value.

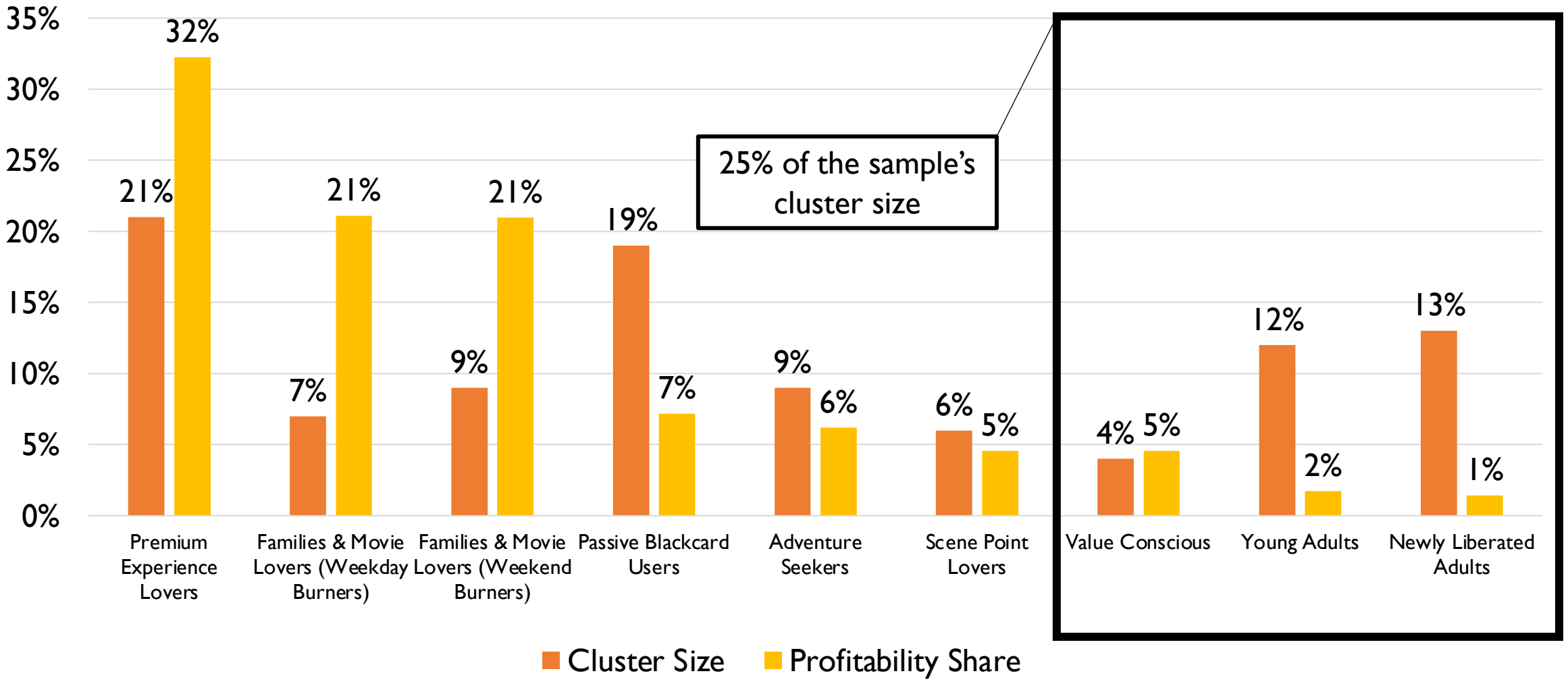
Stay Top of Mind with Online Package Offering

For segments that have high online tendencies (adventure seekers, value conscious and cineplex points lovers)

These groups represent 74% of overall profitability capturing even a portion of their spend would be significant to the business.

New Normal: Create Tailored Offerings to Increase Frequency & Spend

Opportunity to Manage Behaviours of Less Profitable Clusters



A conversion of 100 points = $1 was used to convert SCENE points into dollars. Profitability = (Cineplex Revenue) – (Cost of SCENE Points Burned)

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Low Frequency / Low Spend Clusters

Top Purchases
Walmart
Tim Hortons
Shoppers
McDonalds
Subway

Low Frequency
0 – 3 transactions

Low Concession Tendency

High Online Purchasers

Earners & Redeemers

Young Adults

Newly Liberated

18-24/37-57
Age

$20-22
Total Cineplex Spend Per Person/Year

25%
Size

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Subscription Plan Options

Cinema Lovers

- Higher price point, focused on upselling customers who go to the movies frequently but aren't willing to pay for the VIP tickets
- Spend of what 2-3 movies a month would cost
- Unlimited monthly movies, VIP experiences at discounted cost and exclusive experiences, guaranteed seat selection, early access to new releases

Family

- Encouraging families to increase frequency (and spend)
- Encourage early "movie going" habits
- Spend of what 5 movies per year would cost with 1 adult and 2 kids
- Annual membership, online booking, additional ticket kids/adult discounts, concession discounts, attraction discounts

Low Frequency

- Encouraging frequency of clusters that aren't very profitable during low demand periods
- Spend what 1 ticket would cost / month
- Capitalizing on the market size of these clusters
- Low cost monthly membership, concession discounts, attractions discounts

+

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Subscription Plan Options (Cont'd)

	Cinema Lovers	Family Package (1 adult + 2 kids)	Base Offer
Purpose	Regular revenue from a segment that goes out (but not always to Cineplex. They look for premium & exclusive experiences	Build the "Movie Going" Habit with kids and offer a packaged experience for families that are pressed for things to do	Fill seats that would otherwise be empty and earn revenue from this segment at affordable price point
Subscription Fee/month	$30-35/month (minimum 12 month)	$300/year or $28/month	$10/month (minimum 3-month commit)
Number of movies included	Unlimited	12 /year	1/month
Premium Movie Options	Largest Discount	Medium Discount	No Discount (Pay upgrade cost)
Concession Discount	5% (on top of Scene discount)	5% (on top of Scene discount)	3%
Day/Release Limitations	Limit Friday or Saturday Evening		Limited (only day of showing bookings)
Guaranteed Seat Selection	Yes (online booking only)	Yes (online booking only)	No
Family/Friends Benefit	% off addition Adult tickets	Additional Adults Discount Additional Kid Discount	% off additional tickets (Max of 2)
Event (LBE) Discount	None	% off attractions	% off attractions
Special Access/Perks	Early Access to Booking New Releases & Access to VIP special events	Kids concession bundles Special Kids Programming	
Estimated ROI	A 25% participation rate from the Gold clusters would increase annual revenue contribution by around 2%	A 50% participation rate from the Family and Movie lover clusters would increase annual revenue contribution of by around 2%	Increase the revenue contribution from the Newly Liberated and Young Adult clusters by 1% - 4%

**$based off a $12.99 Adult and $7.99 Child Pricing and would fluctuate depending on your location

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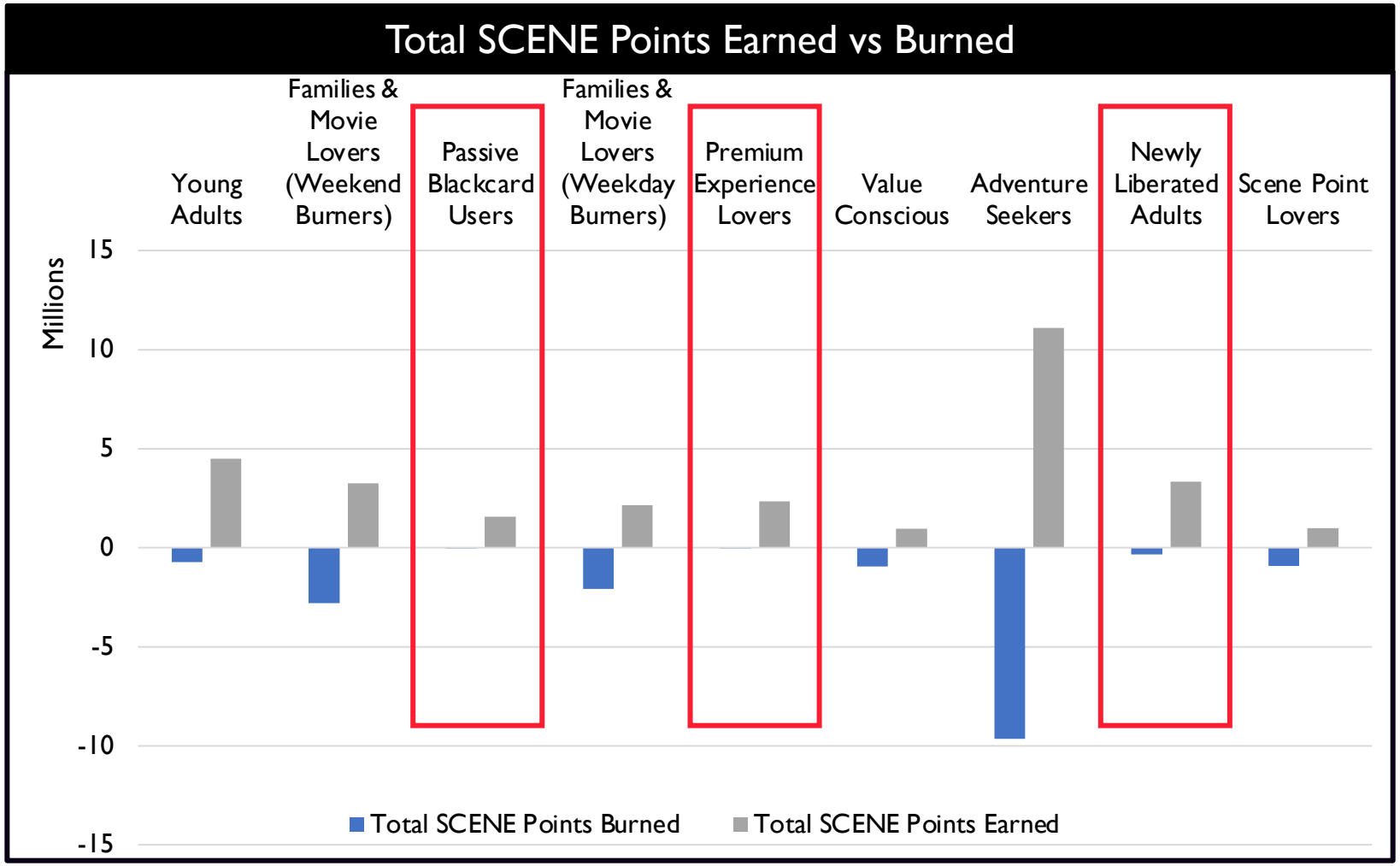
Additional Areas of Opportunity

Not All Cluster are using the Loyalty Program



The 3 clusters (Passive Blackcard Users, Premium Experience Lovers, and Newly Liberated Adults) account for 53% of the sample:

These clusters aren't burning points and possible reasons include:

- Lack of Program Awareness
- Lack of knowledge on how to redeem
- The rewards/points/program doesn't offer them enough value

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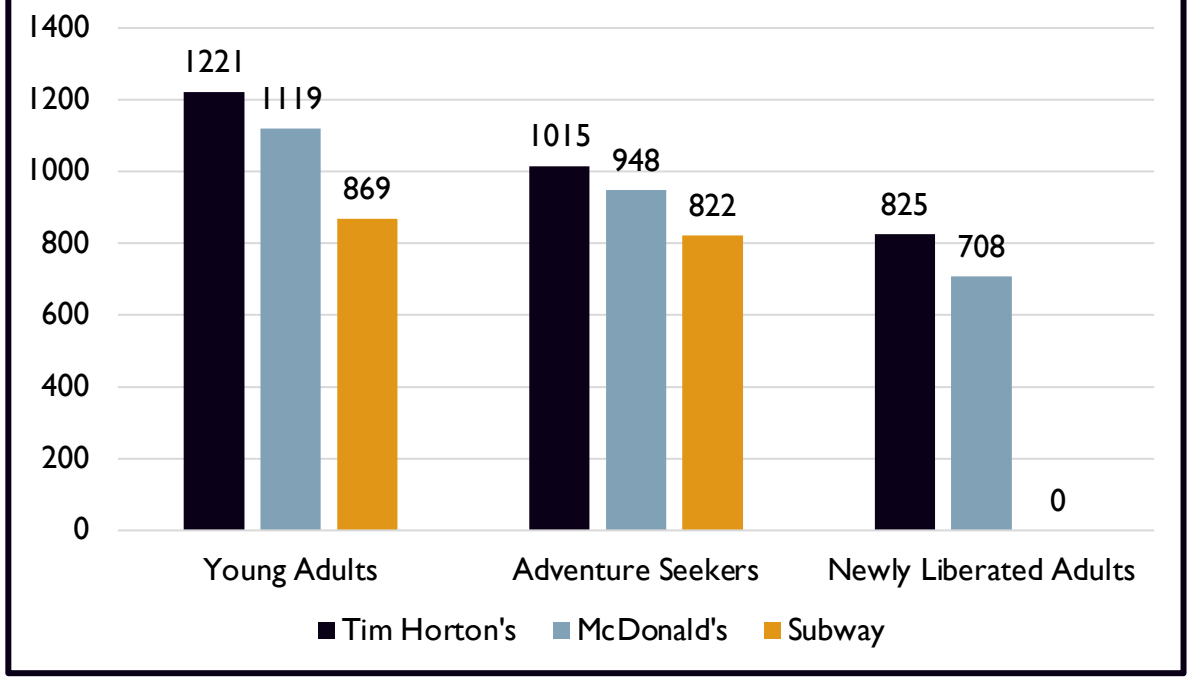
Attribution for Restaurants Was High Among Many of the Clusters

Frequent Item Sets – Top 5



Frequent Item Sets – Top 5

LHS	RHS	Support	Confidence	Lift
{adult tickets}	{mcdonalds}	38%	84%	1.03
{adult tickets}	{subway}	33%	73%	1.03
{adult tickets premium}	{tim horton}	32%	88%	1.00
{adult tickets premium}	{mcdonalds}	31%	86%	1.04

Perhaps a lower price point concession offering would appeal to these clusters and encourage them to increase their concession spend

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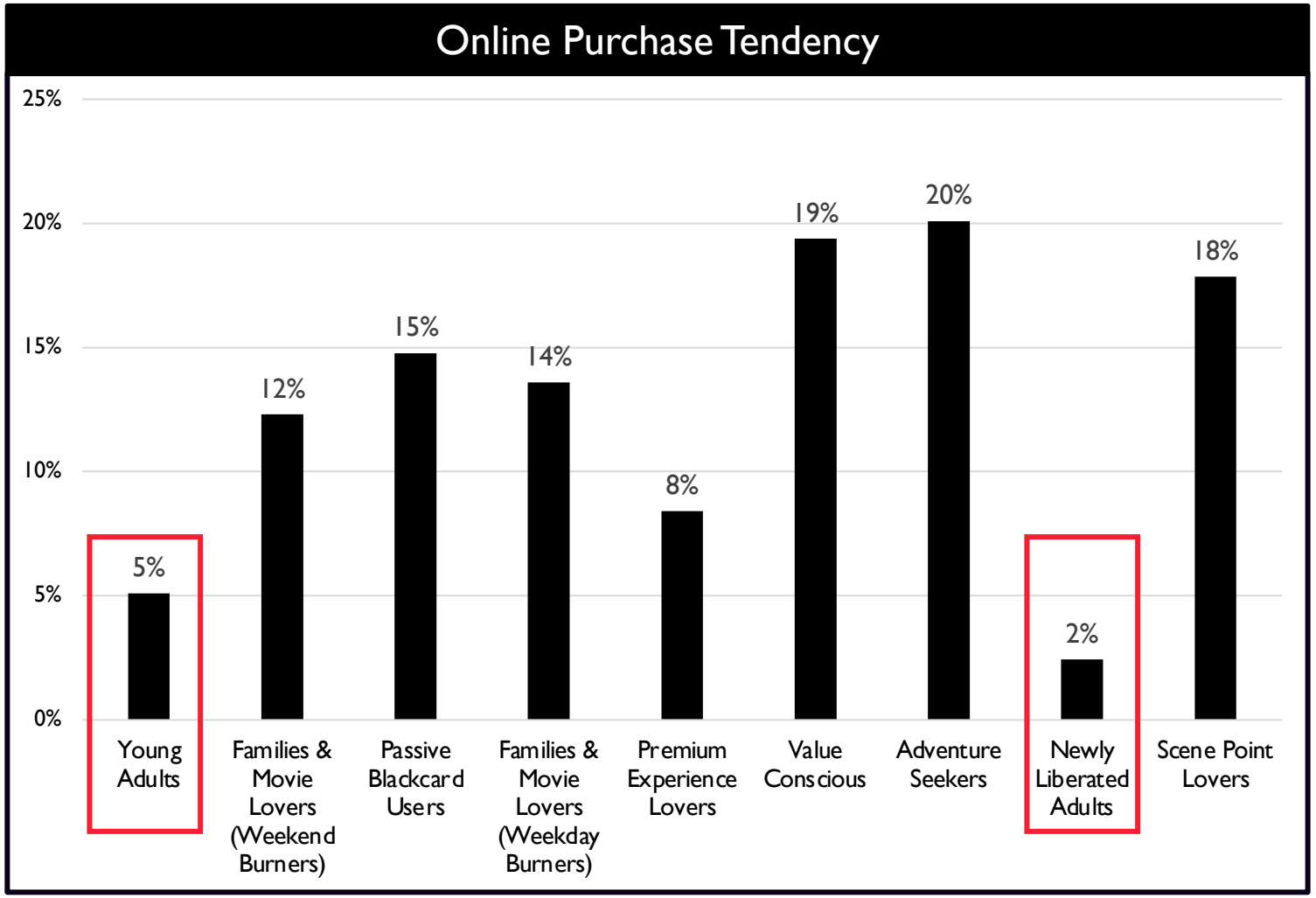
Online Purchase Tendency By Cluster

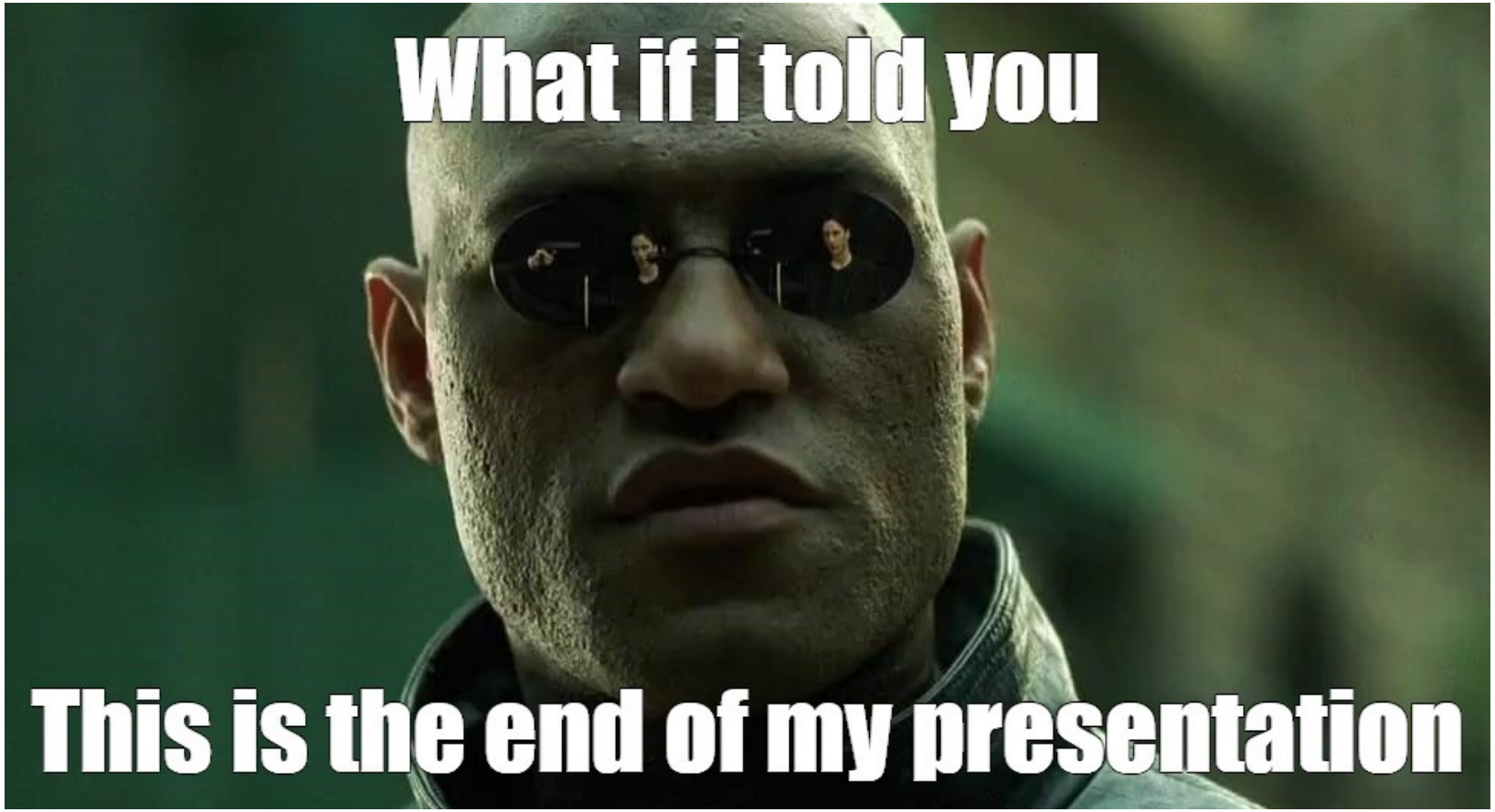


Lowest among the oldest AND the youngest clusters

Possible reasons include:

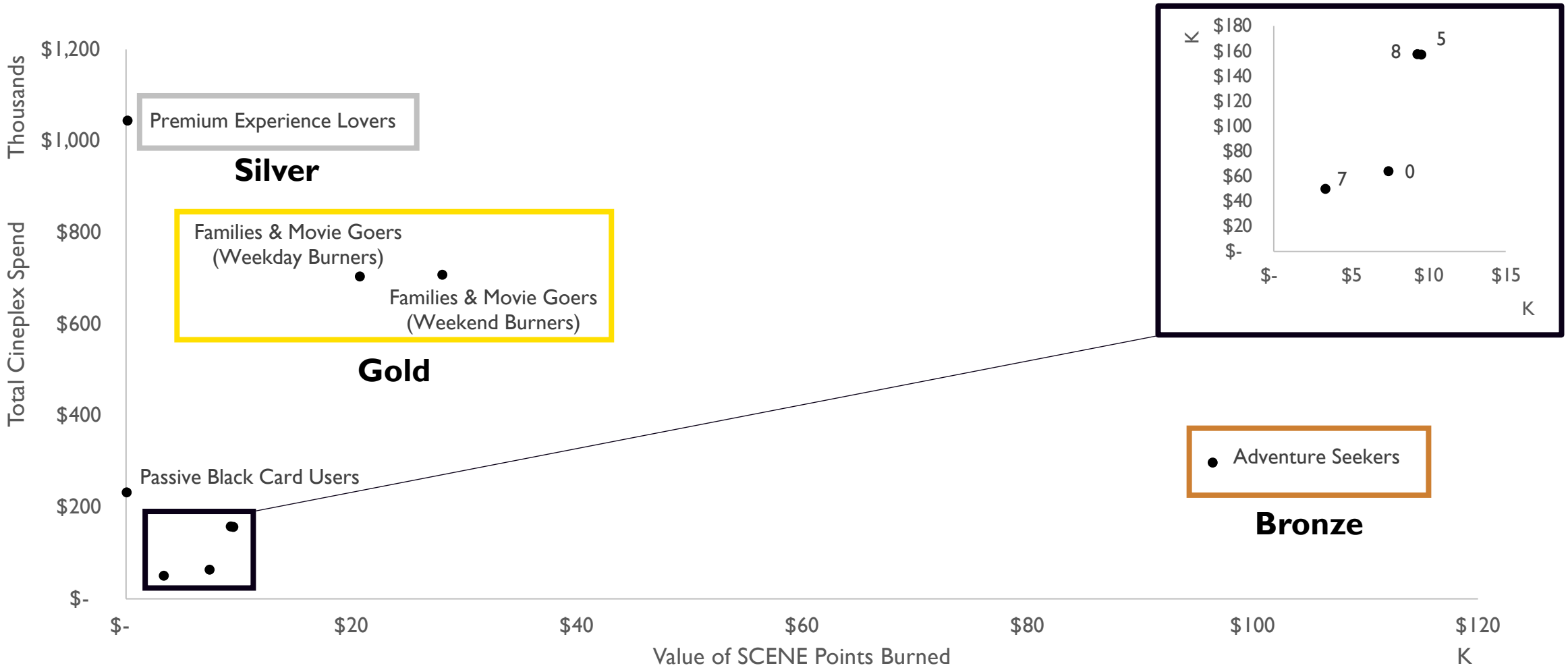
- Overwhelmed by digital options
- Don't know about online purchasing
- Don't see value in current point burning options

Questions?



Cluster Description Appendix

Cineplex has 3 main clusters with unique attributes that help shape them



** A conversion of 100 points = $1 was used to convert SCENE points into dollars. 0: Young Adults, 5: Value Conscious, 7: Newly Liberated Adults, 8: Scene Point Lovers*

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Gold Customer – Cinema Lovers

Top Purchases
Premium Tickets & Child Tickets Among Top Purchases

High Frequency
9 – 42 transactions

High Concession
Tendency 50%

High Online
Purchasers

Earners & Redeemers

Family

Movie Lovers

1 & 3
Cluster

23-(34)-44
Age

16%
Size

Peaks: March, July, December

Traits: Cinema is part of their entertainment habits. They prefer the experience of the big screen. And big screen means big popcorn.

Loyalty: They are avid earners and spenders. But not limited to use points to watch a movie. New account openings declining.

Profitability

42%
Revenue proportion

42%
Yield

$526
Total Cplx Spend/Person/Year

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Silver Customer – Casual Cinephiles

Top Purchases
Premium Adult Tickets & Cara Among Top Purchases

Medium Frequency
4 – 16 transactions

Medium Concession
Tendency 38%

Low Online
Purchasers

Earners

Premium Experience Lovers

4
Cluster

27-(37)-47
Age

21%
Size

Peaks: August

Traits: Professionals who goes out on week-ends but are not set to one venue for entertainment. They prefer variety.

Loyalty: They are high earners in cineplex, but small redeemers. They prefer saving their points for good VIP experience.

Profitability

31%
Revenue proportion

32%
Yield

$305
Total Cplx Spend/Person/Year

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Bronze Customers

Adventure Seekers

9% Size

20-(27)-31 Age

4.1% Yield

9% Revenue Proportion

$25-52 Avg Spend / Transaction

6-22/2yrs Attendance Frequency

Med 31% Concessions

$148 Total Cplx Spend/ Person /Year

Scene Point Lovers

6% Size

24-(36)-46 Age

4.6% Yield

4.6% Revenue Proportion

Unknown Avg Spend / Transaction

5-18/2Yrs Attendance Frequency

None 0% Concessions

$ Unknown Avg Cineplex Spend

Low Frequency Clusters – Low Spend

Newly Liberated

13%	37-(47)-56	1.6%	2%
Size	Age	Yield	Revenue Proportion

$29-66	Once / Yrs	Low 8%	$21
Avg Spend / Transaction	Attendance Frequency	Concessions	Avg Cineplex Spend

Young Adults

12%	18-(21)-24	1.5%	2%
Size	Age	Yield	Revenue Proportion

$17-37	2-4/2yrs	Low 12%	$22
Avg Spend / Transaction	Attendance Frequency	Concessions	Avg Cineplex Spend

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The Extra Segments

Passive BlackCard Users

19% Size

22-(34)-43 Age

0% Yield

<7% Revenue Proportion

Hypothesis : Group of inactive or passive SCENE blackcard owners
Data: Missing Data or Inaccurate collection of Data within Sample

The Value Conscious

4% Size

24-(36)-46 Age

-0.4% Yield

0%

Unknown Avg Spend / Transaction

5-18/2Yrs Attendance Frequency

Medium 44% Concessions

$0 Avg Cineplex Spend

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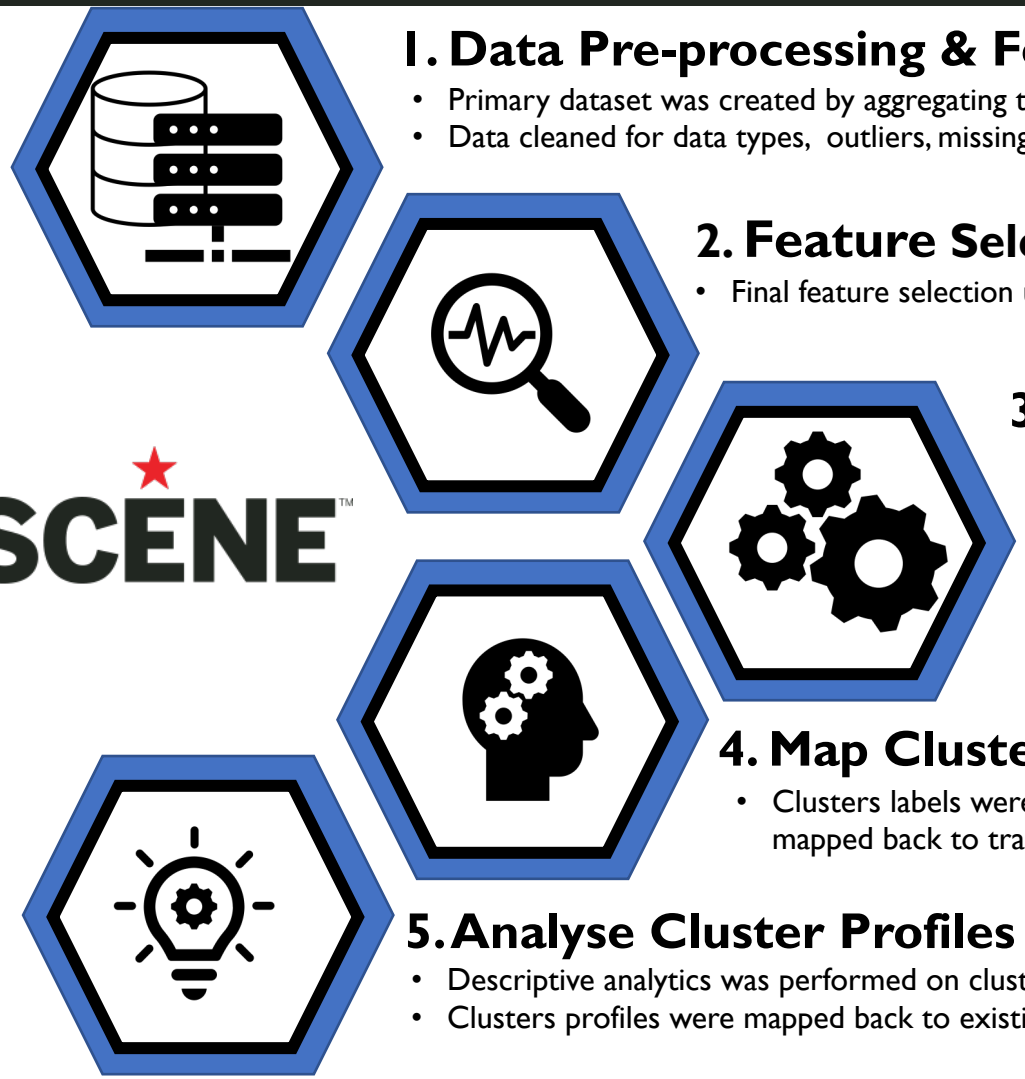
Technical Appendix

What was our process at a high level



1. Data Pre-processing & Feature Engineering

- Primary dataset was created by aggregating the transaction dataset and customer details
- Data cleaned for data types, outliers, missing values, skewedness

2. Feature Selection

- Final feature selection utilized an RFM methodology to summarize customer interaction.

3. Model Selection & Optimization

- K-means, DBSCAN and Hierarchical models were optimized, and resultant measures and summary statistics were analyzed and compared. K-means was selected as our operational model.

4. Map Clusters back to Individual Transactions

- Clusters labels were appended to the existing datasets and mapped back to transactional data

5. Analyse Cluster Profiles

- Descriptive analytics was performed on clusters and association rules for transactions were created.
- Clusters profiles were mapped back to existing Scene customer segments were applicable.

Data Overview, Wrangling and Feature Engineering

Our working dataset consisted of a customer dimension and a transaction aggregate dimension formed primarily from the **SP_CustomerDetail** and **SP_Points** tables.

- The **SP_CustomerDetail** table contained a sample of 18,000 unique customers with demographic summary information such as location (province, city, FSA, etc.), age and gender of each customer. Our initial data exploration identified data quality issues with province and city. These two location features were removed from the final dataset and new feature were created from the FSA code(forward sortation area) using a translation table derived from StatsCan. Two provide better flexibility in modelling with the customer age, we dropped the pre-derived age ranges and calculated a new feature by joining birth date (from **SP_FactEnrollment**) to **SP_CustomerDetail**.
    - Additional customer dimension and tendency flags from **SP_QualityActivity**, **SP_FactAttribute** and **SP_PointTypeStatics** were initially brought into the final dataset for additional context but were removed from the modelling dataset due to data sparsity and disparities with sampled transaction data from the SP_Points table (tendency flags created from the population were not adequately reflected in the data sample).
- The **SP_Points** table is a sample of customer transactions containing 1,196,534 observations with unique identifier, transaction identifiers, date, dollar amount and point counts. Our feature engineering was primary done on the **SP_Points** table, creating 61 new transaction features which were aggregated at the customer level. The resulting aggregate transaction table contained 12,835 observations.

The final working dataset created from joining the aggregate transaction table to the customer dimension table.

Data Cleaning and Pre-Processing

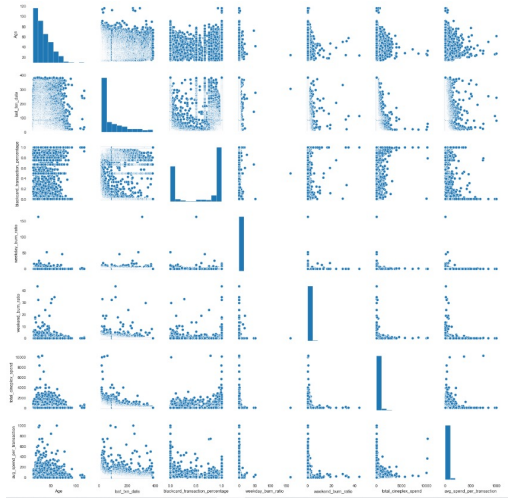


Figure 1: Pairwise plot sample of raw data (select features)

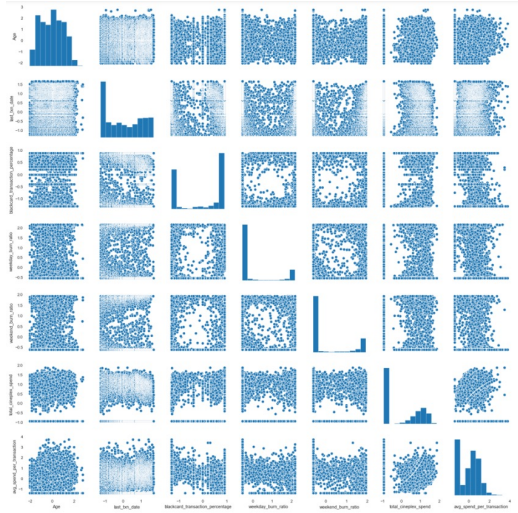


Figure 2: Pairwise plot after Yeo-Johnson Power Transformation

Misalignment Between Customer and Transaction Dimensions

Of the 18,000 unique customers, 5,165 customers had no transaction in the sample transaction data (SP_Points). These customer also had tendency flags such as isQuality and isActive that denoted a transaction frequency threshold that was in contrast the trends observed in the transactions. 5,165 customers customer were dropped to prevent the divergence of our data.

Feature Sparsity in Dataset

The customer flags were categorical variables that were converted into binary variables. In exploring these features, we noticed that they formed an extremely sparse matrix with values predominately 0. These flags were provided by Scene (based on their internal business rules). These tendency flags were dropped from our model as they were too skewed to model against.

Skewedness

The transactional dataset was extremely skewed in the distribution of points in many of the features, for example one case was dollar spend among customers. In our PDA, we identified that some transaction amounts were extreme outliers (could be a symptom of sampling). In order to eliminate these transaction without over sanitizing our dataset, we combined the transaction amount and frequency by calculating an average spend per transaction field and capped the amount to $1,000. To correct the skewedness of the data we used the Yeo-Johnson power transformation since we had both positive and negative values in our dataset.

Relative Units of Measurement and Scale

Our dataset contained a variety of unit measures including transaction counts, dollar values, point balances, ratio, etc. We used standard scaler to standardize the units before modelling.

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Feature Selection

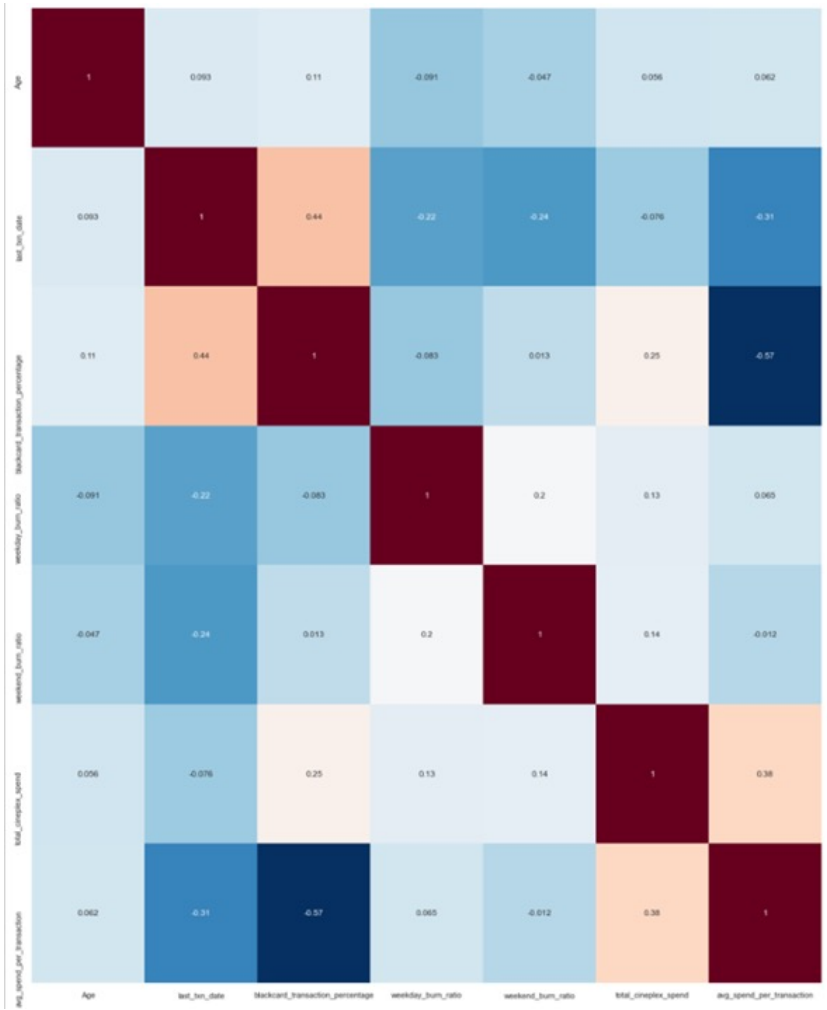

Figure 3: Pairwise Correlation Plot for Selected Features

Our final feature selection methodology was based on the RFM(Recency-Frequency and Monetary) methodology commonly used in market research for identifying customer value.

Recency: The number of days since the customer's last transaction with the Cineplex ecosystem. We used the last transaction date field calculated the number of days since the customer's last cineplex transaction to the end of the calendar year 2017 (based on metadata and documentation provided).

Frequency: The number of black card transactions made by the customer within the one-year sample of transaction data provided represented as a ratio of black card transaction vs non-black card transactions. Frequency was also included in some of the calculation of the monetary features to eliminate the correlation of the features.

Monetary: Various spending features representing dimension of point value and dollar value for each customer. We used weekday points burn ratio, weekend points burn ratio, total cineplex spend, and average spend per transaction.

We checked for correlation between our selected variables using the pairwise correlation plot and selected one out of two features if there is correlation.

Selected Features:

{Age, days since last transaction , black card transaction proportion, weekday and weekend point usage ratios, total cineplex spend, average spend per transaction.}

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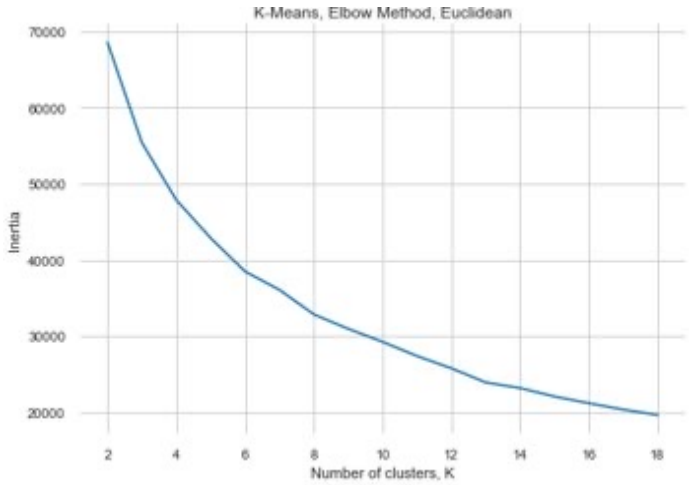
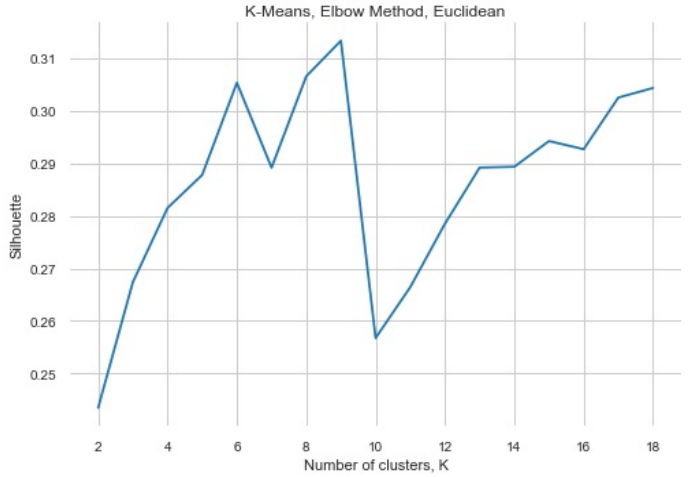
Model Optimization and Output

We tuned the hyperparameters of our K-means model by utilizing the elbow plots for Inertia (WCSS) and silhouette scores to determine the optimum number of cluster for our dataset.

Our optimal K value in the inertia elbow plot was around 9 clusters,, the silhouette elbow plot showed an optimum value with 9 clusters.

This resulted in 9 clusters with an inertia of 30,933 and silhouette score of 0.31. The cluster summary can be found in appendix 1.





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Model Validation

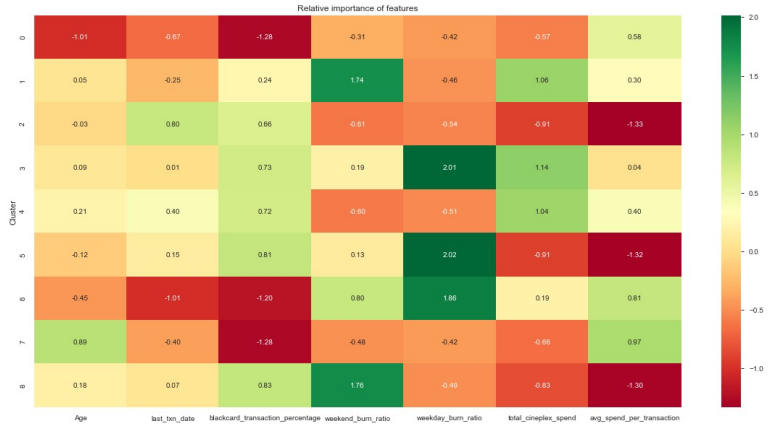

Figure 6: Relative Importance Plot Showing Cross Clusters Variation

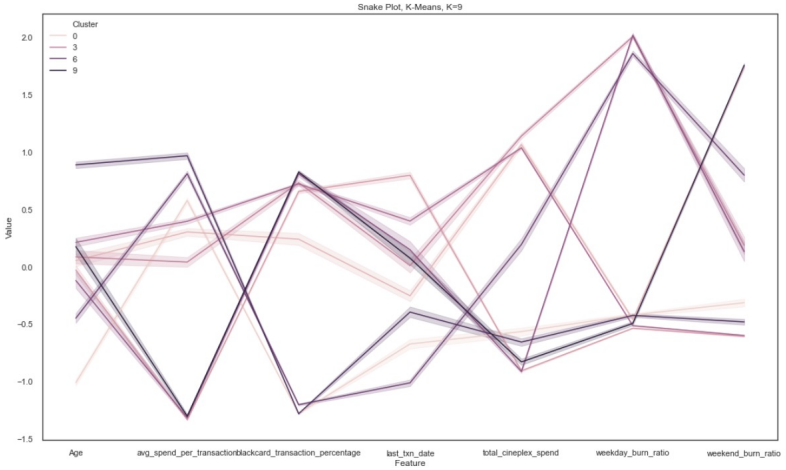

Figure 7: Snake Plot Showing Cluster Heterogeneity

The relative importance plot (appendix 2) shows us the impact of each feature on determining the cluster classification of the customer. We can see that we have a good amount of variation of feature importance across the different clusters.

The snake plot (appendix 3) does illustrate some variation between cluster across our features based on how each the lines diverging from one another as they cross features.

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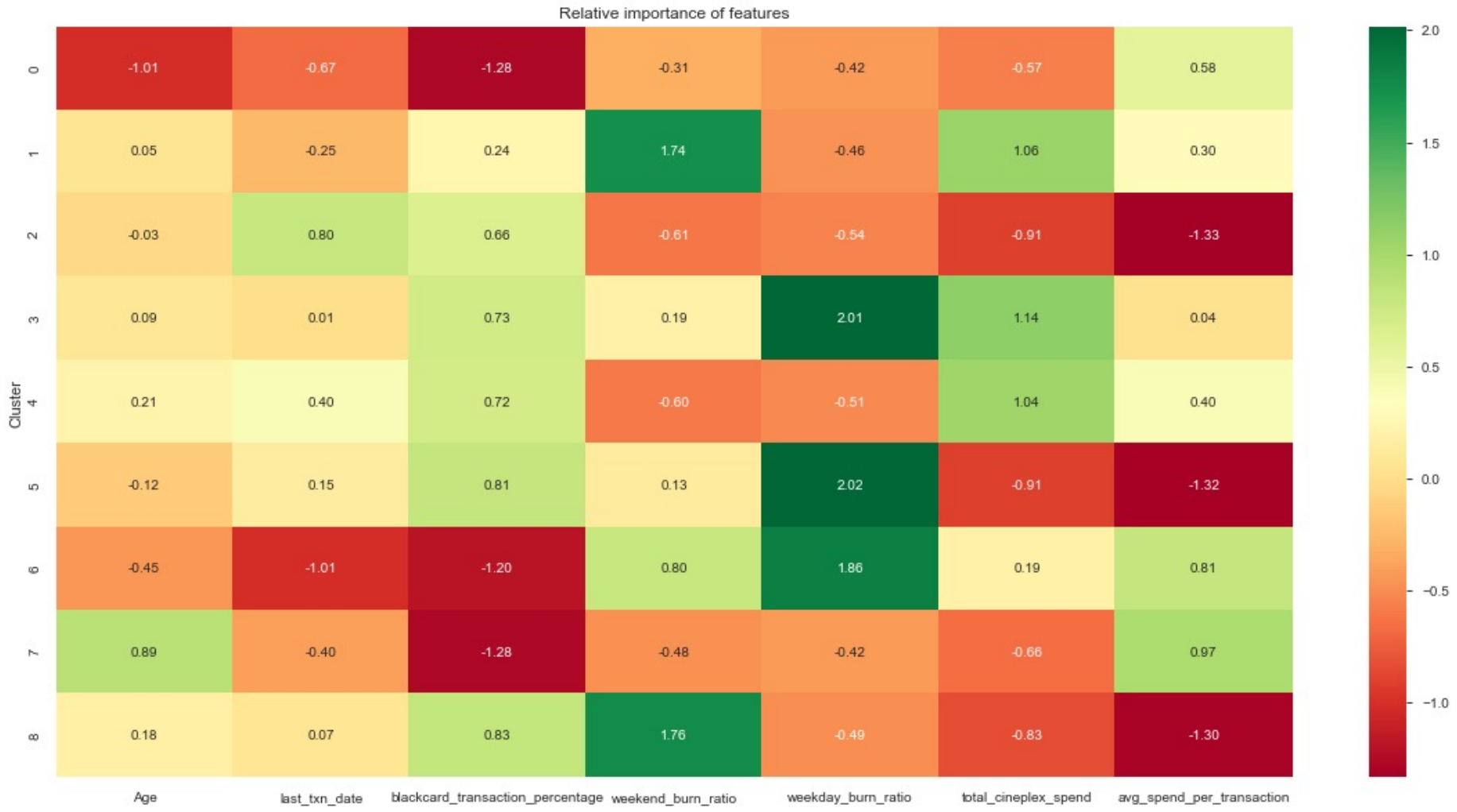
Appendix 1: Relative Importance Plot



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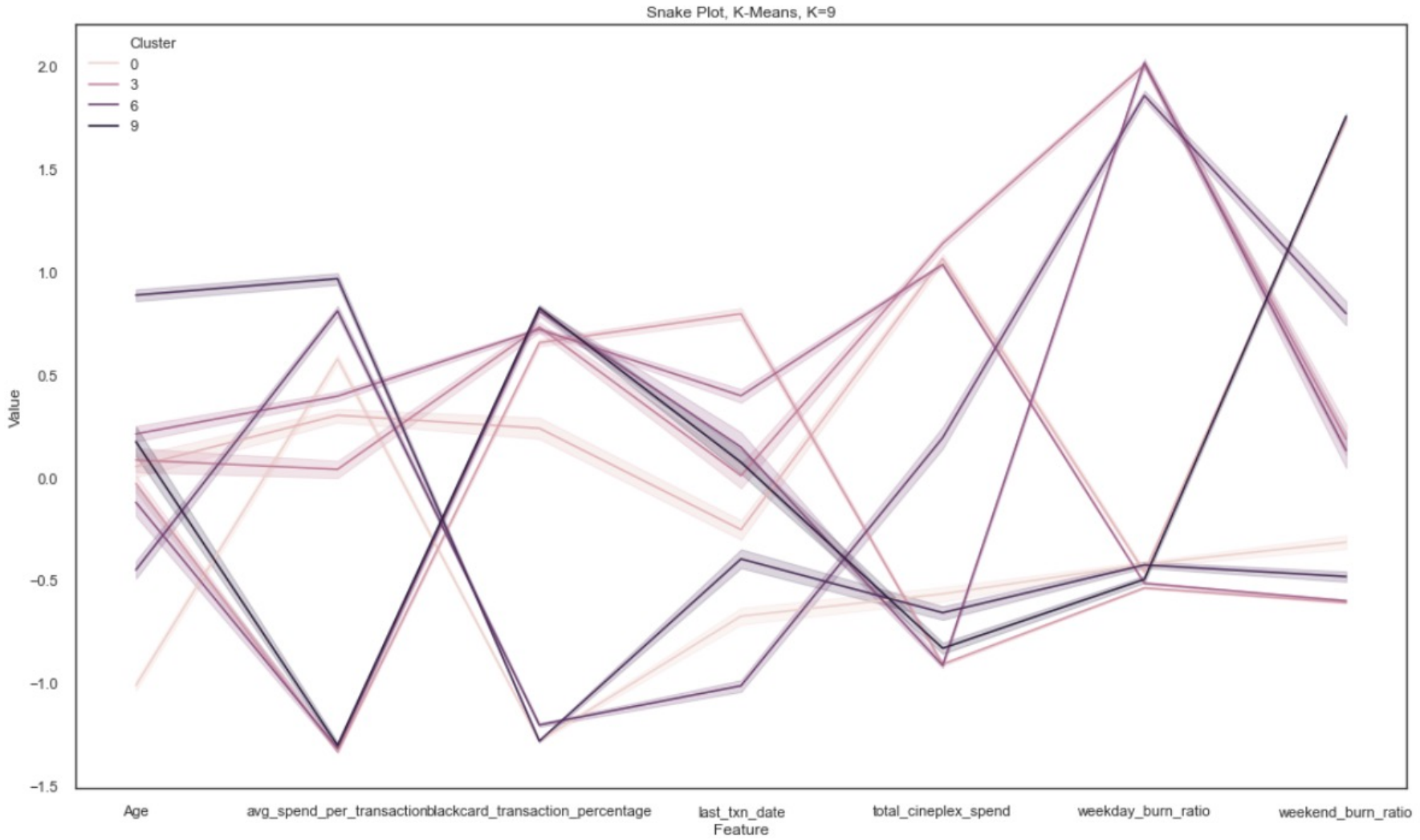
Appendix 2: Snake Plot of Features



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Appendix 3: Means of Clusters

MEANS (Cluster Reference & Size)	Age	Last Transaction Date	Blackcard transaction %	Wkday Burn Ratio	Wkd Burn Ratio	Total Yearly Cineplex Spend	Avg Spend / Transaction	# of Cineplex Transac
Young Adults (Cluster 0, 1591)	20	45	0.02	0.01	0.11	22.29	33.87	2.4
Families & Movie Goers Weekend (Cluster 1,1146)	34	57	0.72	0	1.62	420.91	25.53	30.4
Passive Blackcard Users (Cluster 2, 2424)	34	158	0.91	0	0	0.35	0.11	5.22
Families & Movie Goers Weekday (Cluster 3, 838)	34	74	0.94	1.08	0.28	526.68	18.27	38.2
Premium Experience (Cluster 4, 2739)	37	110	0.94	0	0	304.52	29.34	18.3
Value Conscious (Cluster 5, 547)	32	86	0.97	1.68	0.25	0.34	0.31	17.63
Adventure Seekers (Cluster 6, 1155)	27	25	0.07	0.67	0.42	147.84	45.01	20.54
Newly Liberated (Cluster 7, 1603)	47	63	0.02	0.06	0.09	20.69	62.64	1.34
Scene Point Lovers (Cluster 8, 706)	37	78	0.97	0	7.18	1.82	0.33	13.84

Appendix 4: Cluster Numbers to Segment Names Reference

Cluster 0: Young Adults

Cluster 1: Families & Movie Lovers (Weekend Burners)

Cluster 2: Passive Blackcard Users

Cluster 3: Families & Movie Lovers (Weekday Burners)

Cluster 4: Premium Experience Lovers

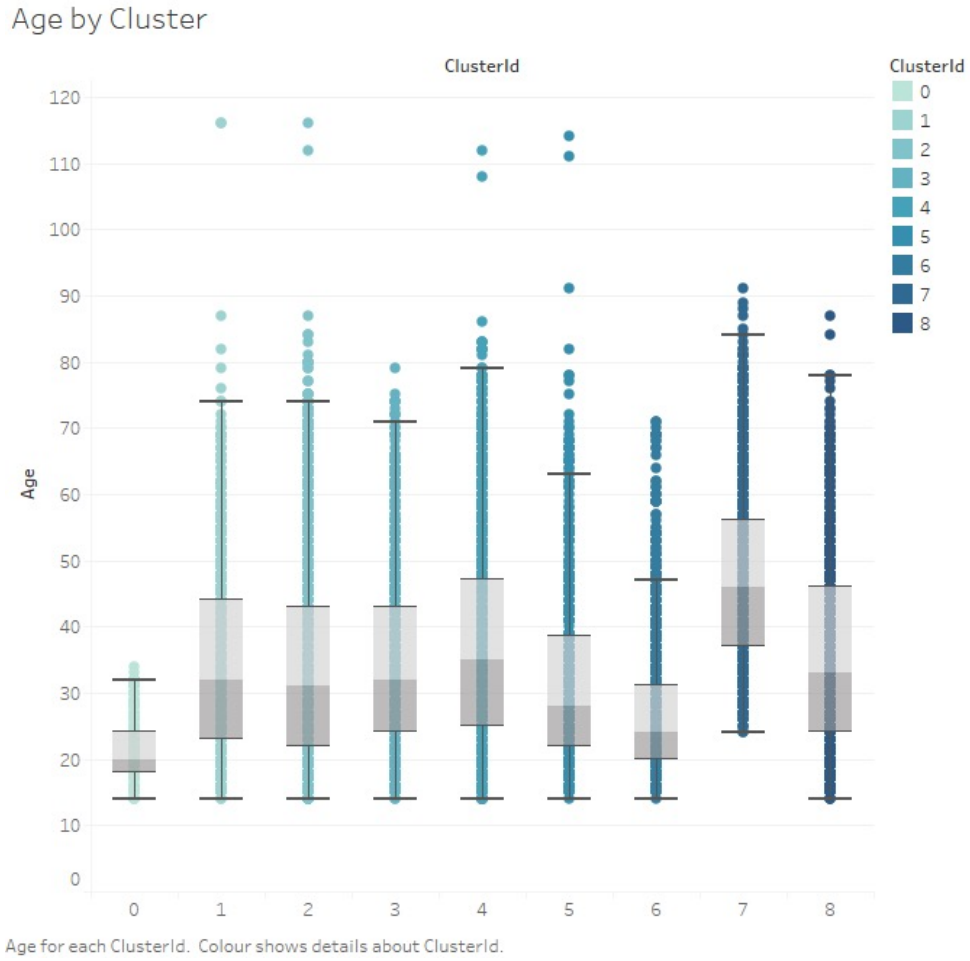
Cluster 5: Value Conscious

Cluster 6: Adventure Seekers

Cluster 7: Newly Liberated Adults

Cluster 8: Scene Point Lovers

Appendix 5: Age by Cluster



Appendix 6: Tendencies of Clusters

Size of Clusters

ClusterId	
Grand Total	12,749
Young Adults	1,591
Families & Movie Lovers (..	1,146
Passive Blackcard Users	2,424
Families & Movie Lovers (..	838
Premium Experience Love..	2,739
Value Conscious	547
Adventure Seekers	1,155
Newly Liberated Adults	1,603
Scene Point Lovers	706

Count of Unique_member_identifier broken down by ClusterId.

Child Tendancy Percentage

ClusterId	
Young Adults	0.57%
Families & Movie Lovers (Wkend Burners)	19.46%
Passive Blackcard Users	9.78%
Families & Movie Lovers (Wkday Burners)	19.81%
Premium Experience Lovers	10.66%
Value Conscious	8.23%
Adventure Seekers	4.24%
Newly Liberated Adults	2.37%
Scene Point Lovers	12.32%

Percentage Child Tende..
0.57% 19.81%

Percentage Child Tendency broken down by ClusterId. Colour shows Percentage Child Tendency. The marks are labelled by Percentage Child Tendency.

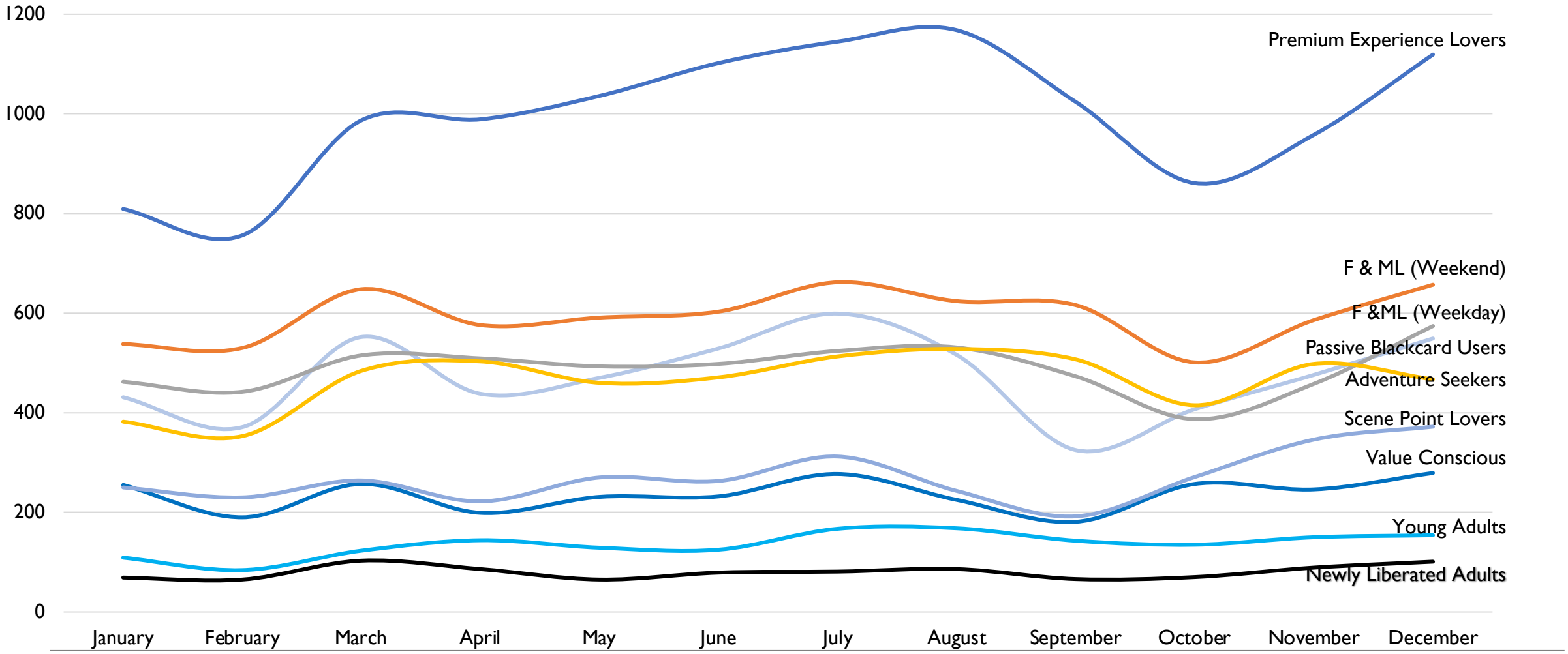
Blackcard usage vs Scotiabank Credit or Debit Card

ClusterId	Avg. isBNS_..	total_tr..	total_bl..	total_n..
Young Adults	1	295,871	3,301	292,570
Families & Movie Lovers (..	0	127,552	34,711	92,841
Passive Blackcard Users	0	13,528	12,645	883
Families & Movie Lovers (..	0	34,191	32,055	2,136
Premium Experience Love..	0	53,849	50,142	3,707
Value Conscious	0	9,992	9,641	351
Adventure Seekers	1	422,798	23,067	399,731
Newly Liberated Adults	1	228,423	1,992	226,431
Scene Point Lovers	0	10,012	9,772	240

Avg. isBNS_VCL, total_transactions, total_blackcard_transactions and total_nonblackcard_transactions broken down by ClusterId.

SCENE

Appendix 7: Attendance by Month



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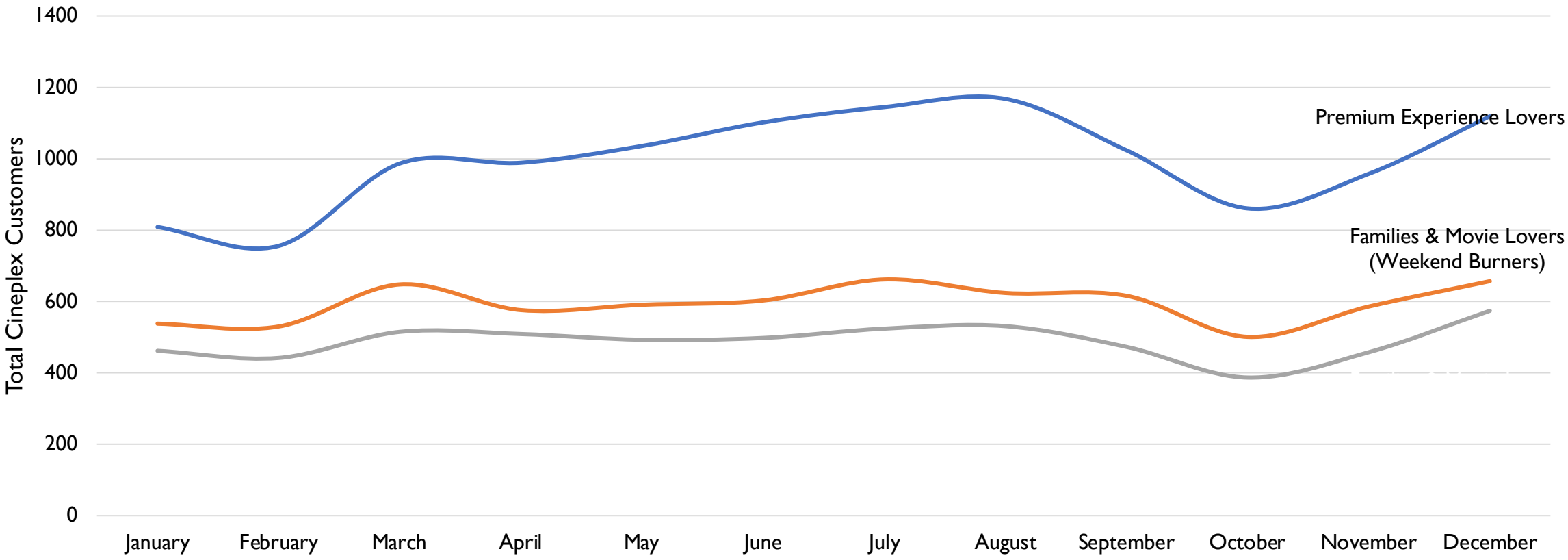
Appendix 8: Gold and Silver Cluster Attendance By Month



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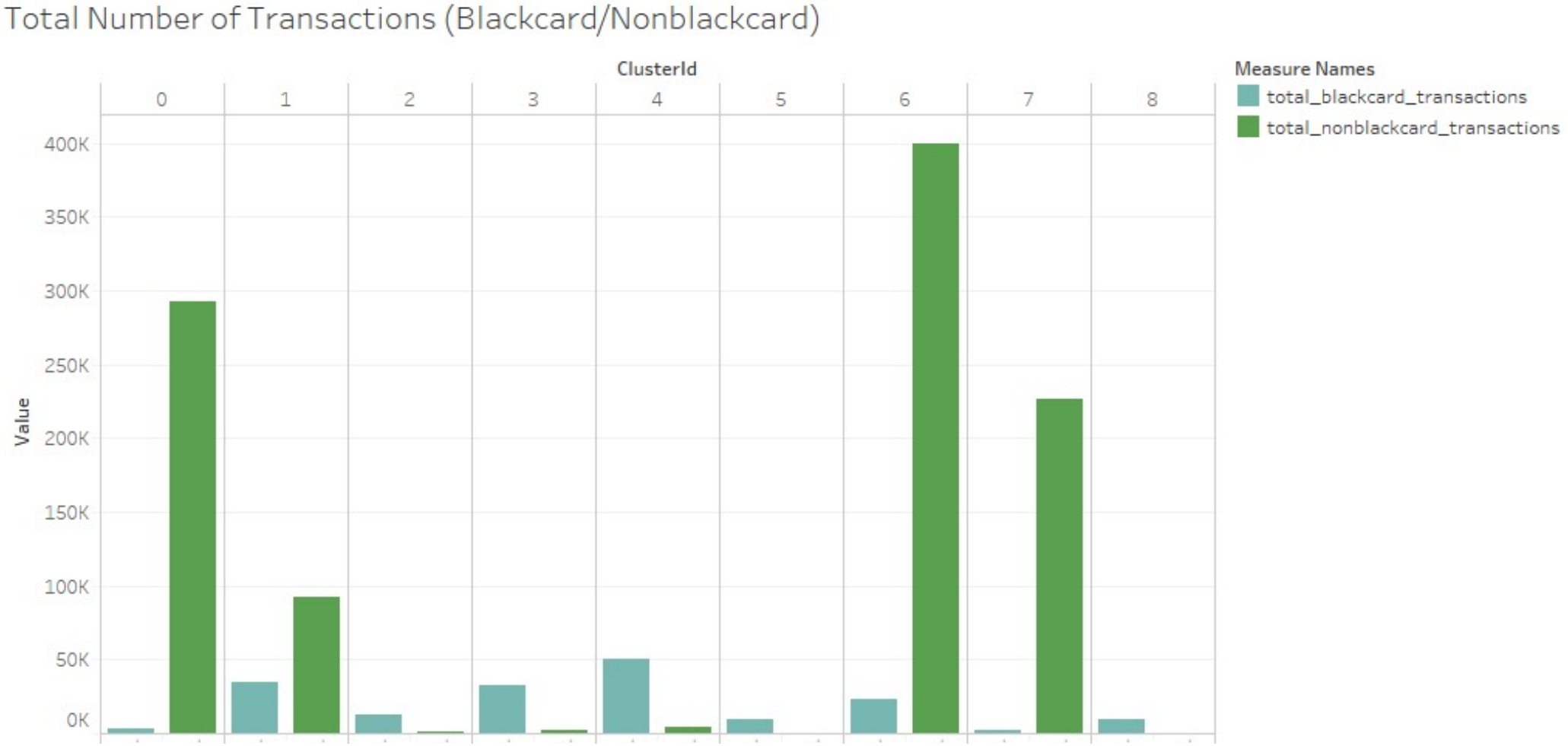
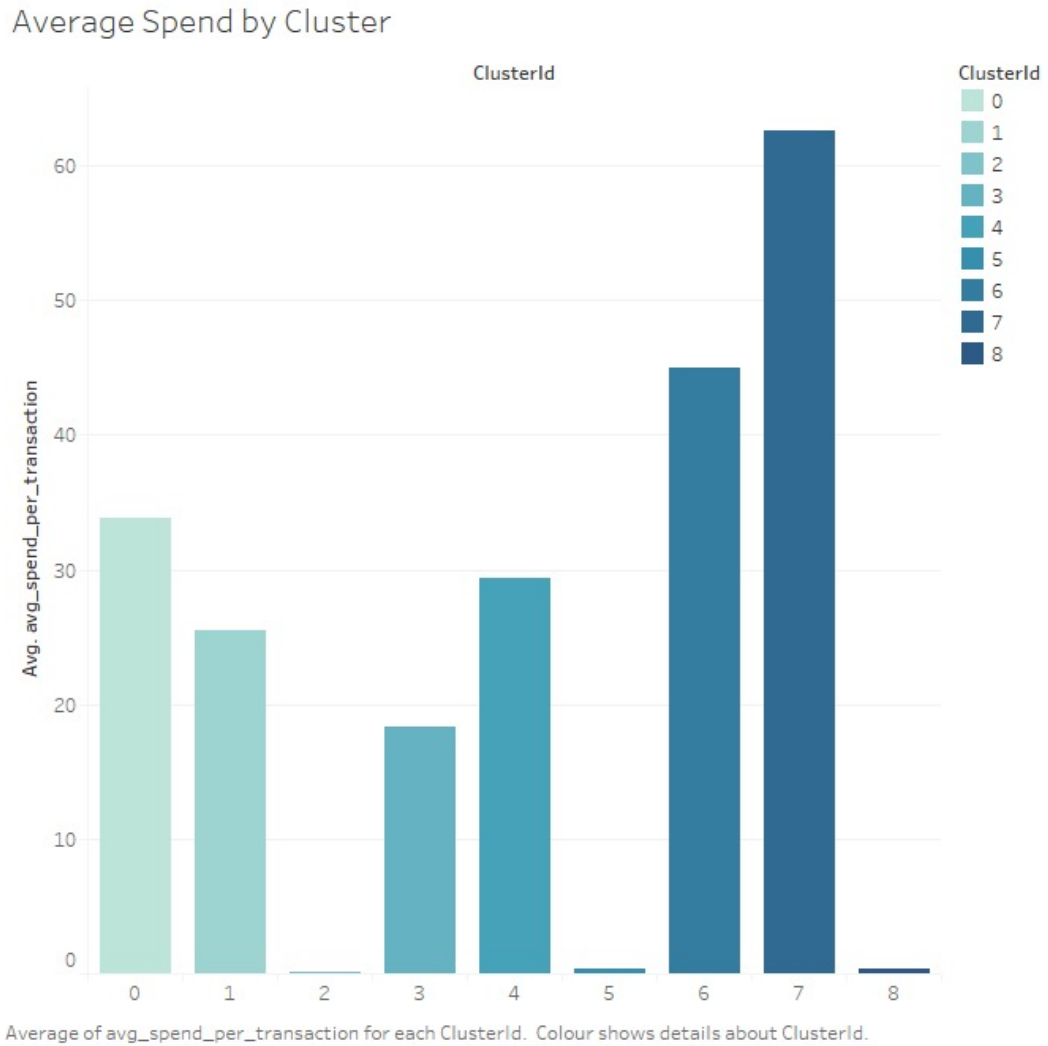
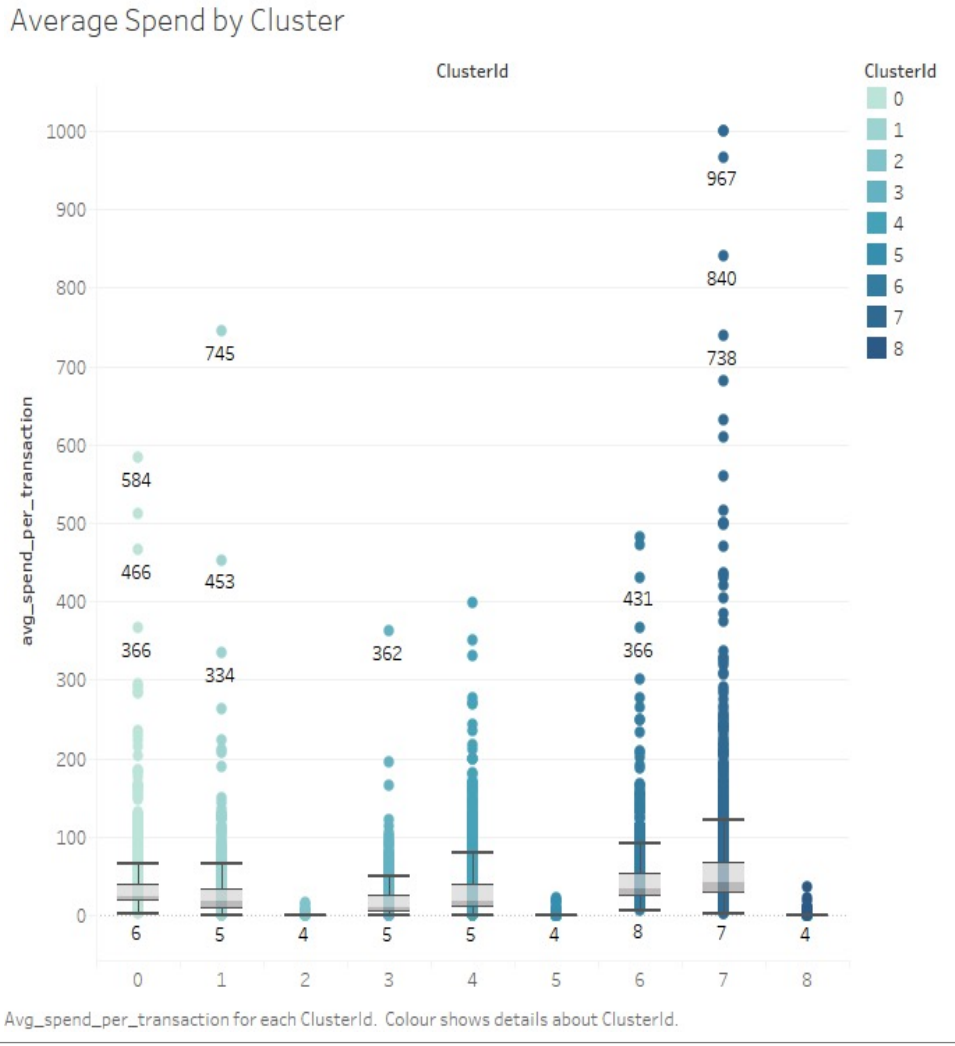
Appendix 9: Number of Transactions by Type and Cluster



Appendix 10: Average Spend by Cluster





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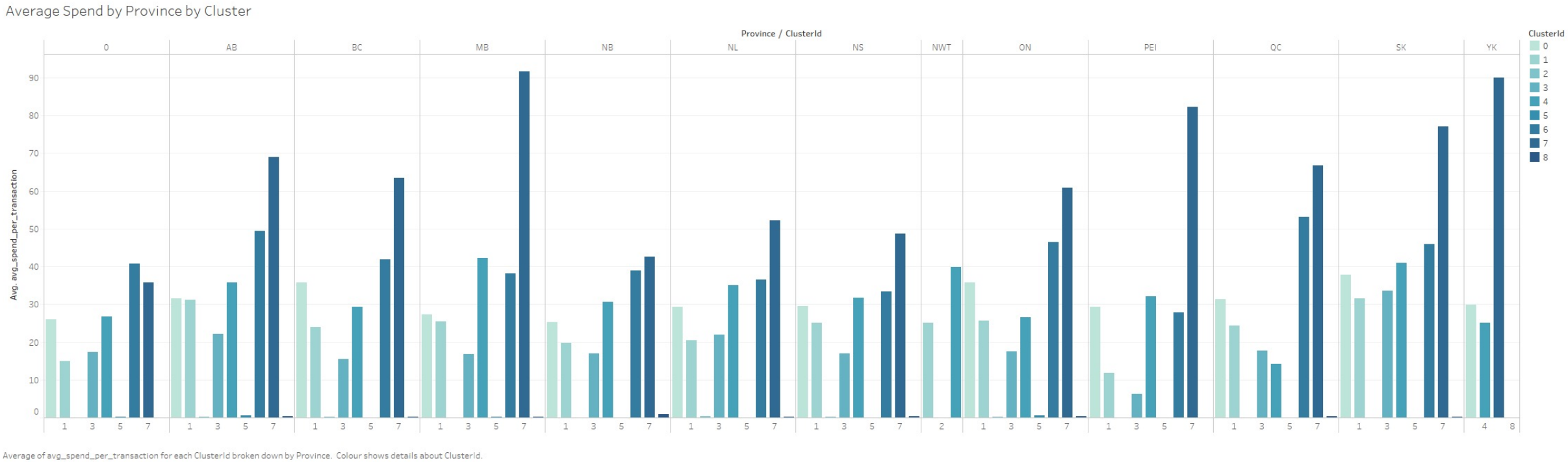
Appendix 11: Average Spend by Province



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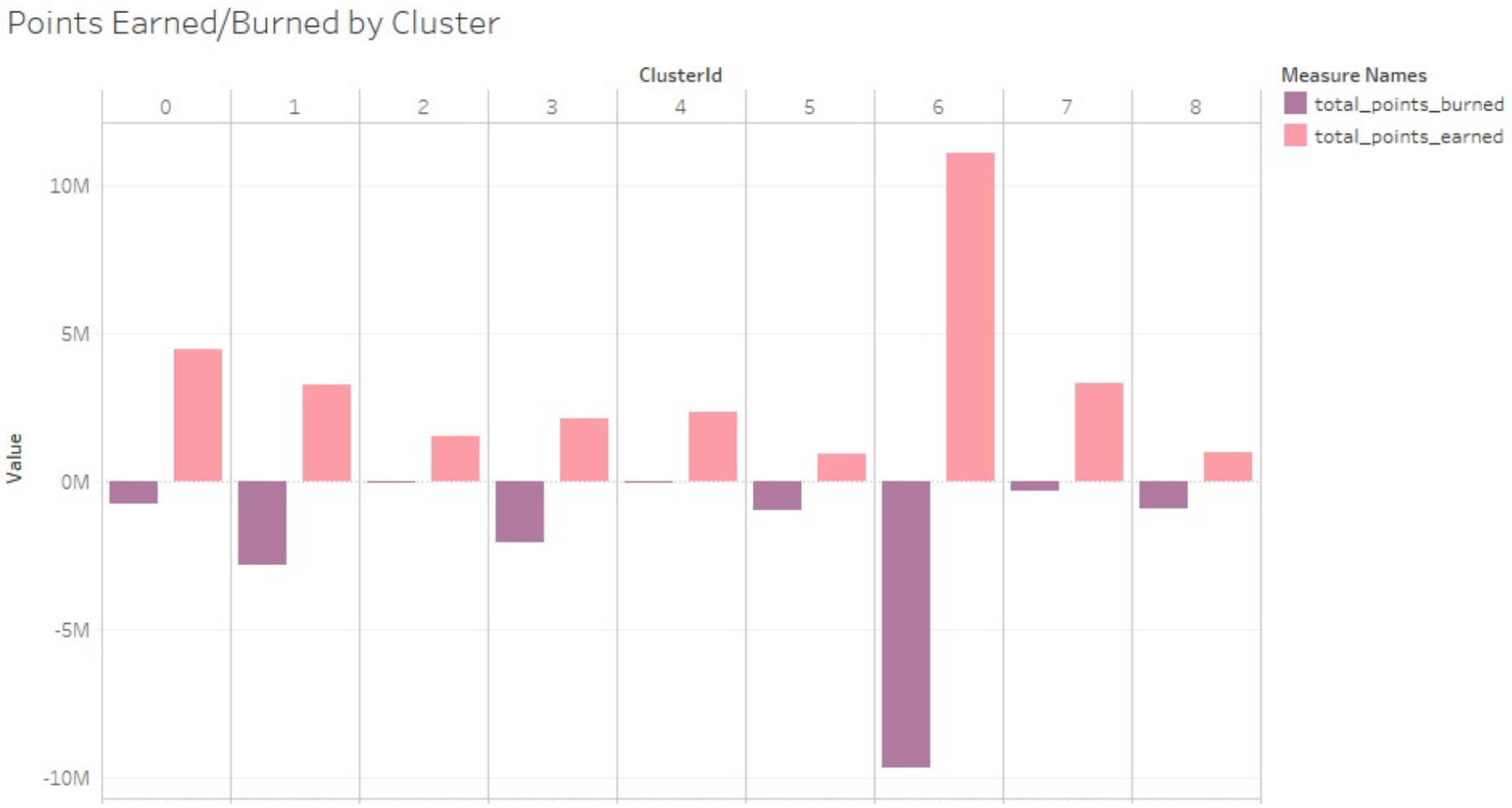
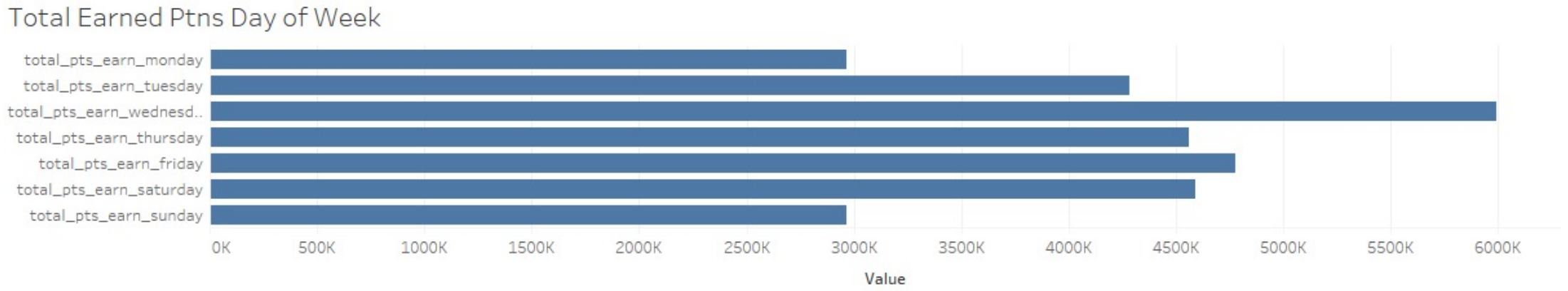
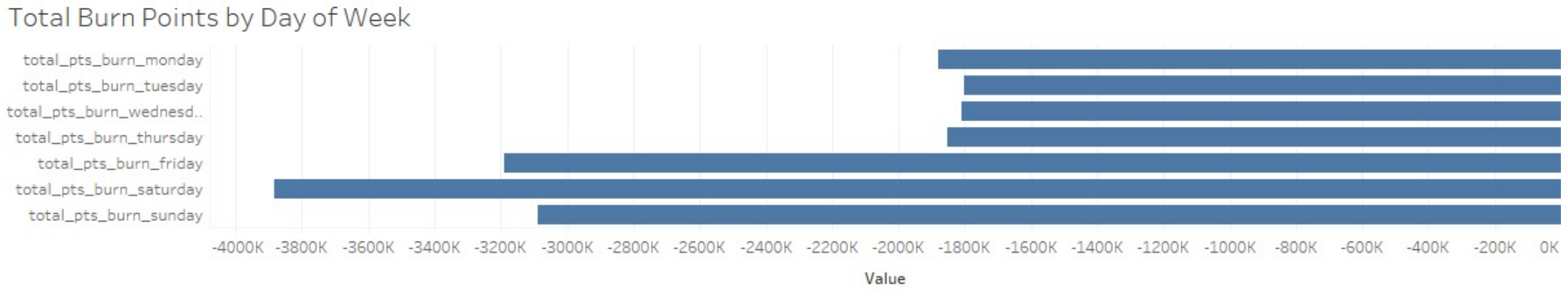
Appendix 12: Points Earned/Burned by Cluster



Appendix 13: Total Points Earned and Burned by Day



Total_pts_earn_friday, total_pts_earn_monday, total_pts_earn_saturday, total_pts_earn_sunday, total_pts_earn_thursday, total_pts_earn_tuesday and total_pts_earn_wednesday.



Total_pts_burn_friday, total_pts_burn_monday, total_pts_burn_saturday, total_pts_burn_sunday, total_pts_burn_thursday, total_pts_burn_tuesday and total_pts_burn_wednesday.

SCENE

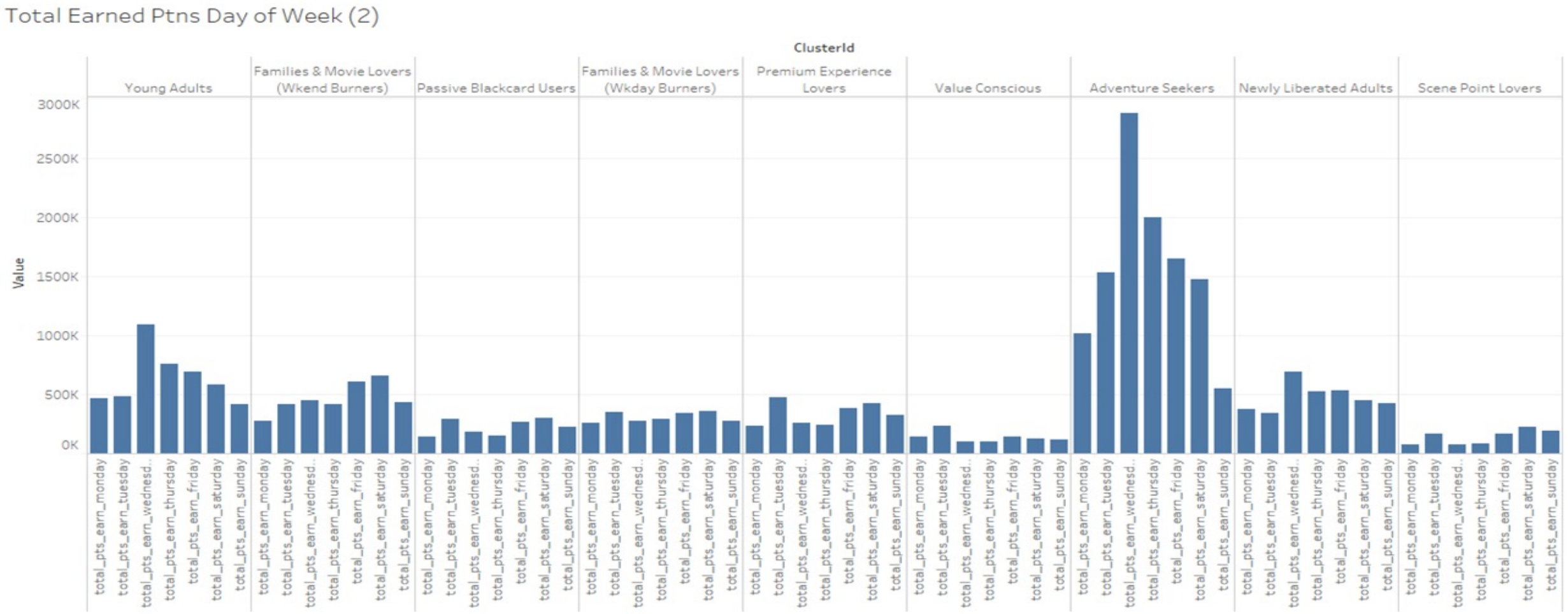
Appendix 14: Burn Ratios

Burn Ratios

ClusterId								
Young Adults	Families & Movie..	Passive Blackca..	Families & Movie..	Premium Experie..	Value Conscious	Adventure Seeke..	Newly Liberat..	Scene Point L..
0.115	1.620	0.002	1.357	0.004	2.049	1.085	0.141	6.769

Average of total_burn_ratio broken down by ClusterId.

Appendix 15: Earned Points by Cluster by Day of the Week



Total_pts_earn_monday, total_pts_earn_tuesday, total_pts_earn_wednesday, total_pts_earn_thursday, total_pts_earn_friday, total_pts_earn_saturday and total_pts_earn_sunday for each ClusterId.

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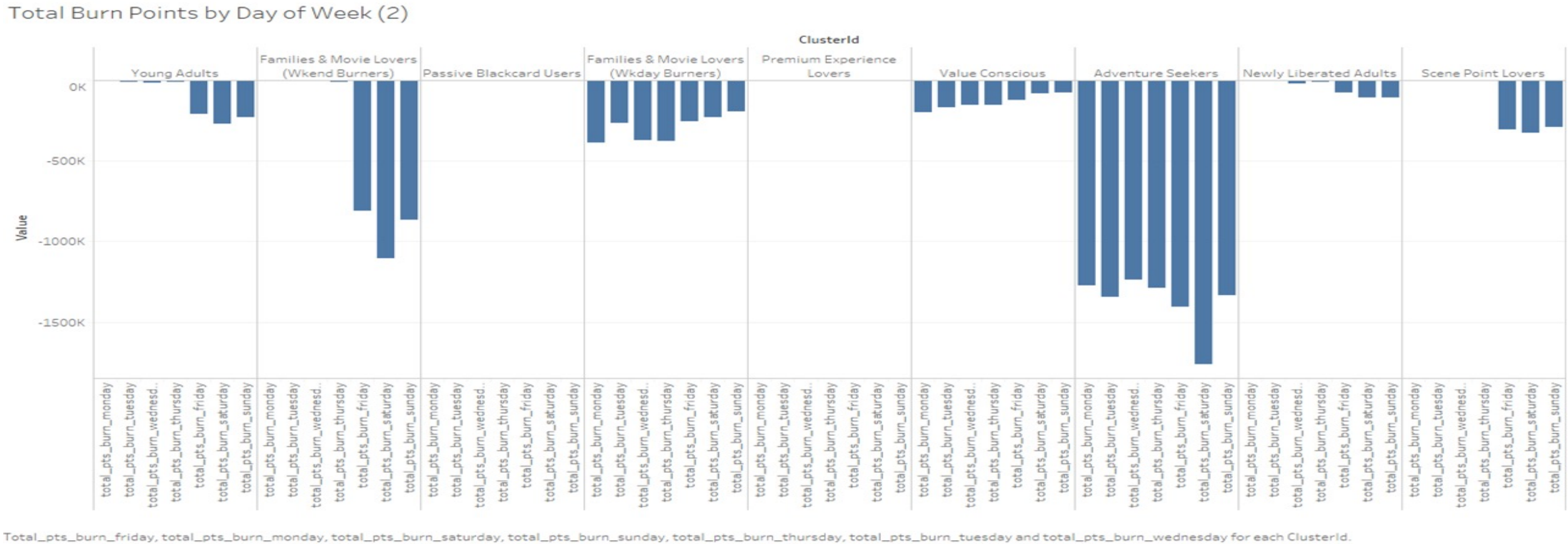
Appendix 16: Burned Points by Cluster by Day of the Week



Total_pts_burn_friday, total_pts_burn_monday, total_pts_burn_saturday, total_pts_burn_sunday, total_pts_burn_thursday, total_pts_burn_tuesday and total_pts_burn_wednesday for each ClusterId.

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