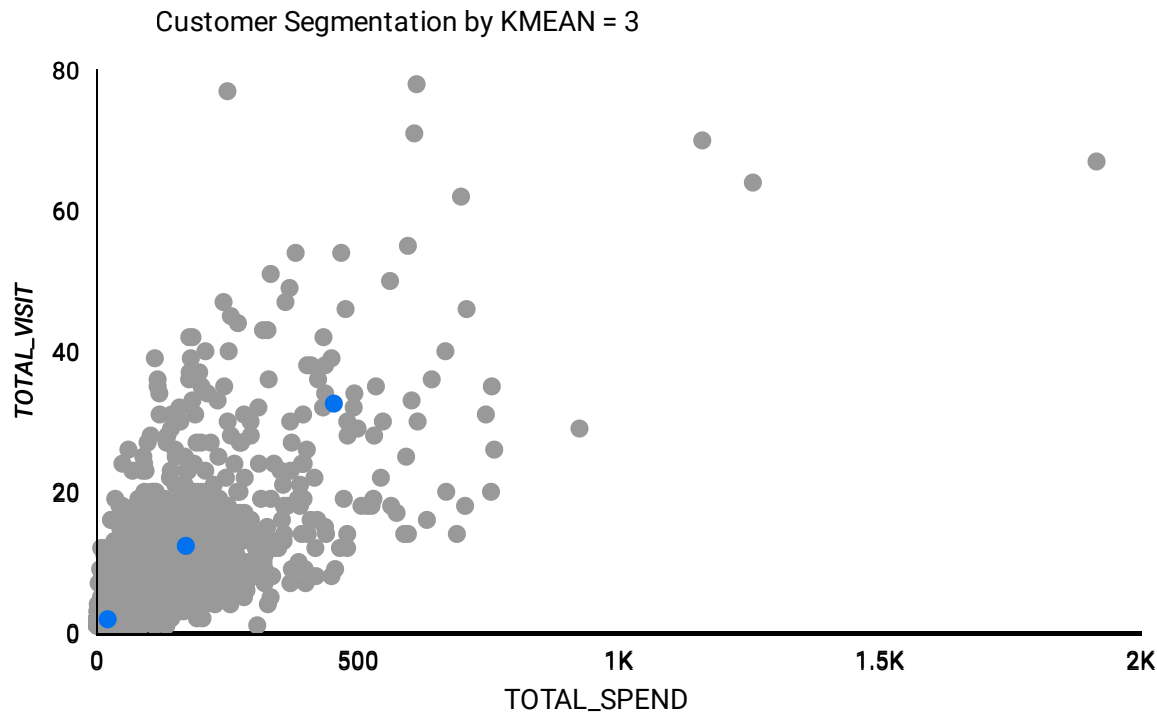


HW6: Customer Segmentation

NOTE:

- **K means clustering**, K = 3
- Period of data only 3 months (Q2/2008) so it does not use spending/visiting
- It should analyze every quarter



| | CUST_CODE ▲ | CENTROID_ID | TOTAL_VISIT | TOTAL_SPEND |
|-----|----------------|-------------|-------------|-------------|
| 1. | CUST0000000369 | 3 | 24 | 90.34 |
| 2. | CUST0000000689 | 1 | 4 | 84.23 |
| 3. | CUST0000001163 | 1 | 1 | 0.52 |
| 4. | CUST0000001194 | 3 | 12 | 304.16 |
| 5. | CUST0000002605 | 1 | 2 | 0.6 |
| 6. | CUST0000002637 | 1 | 2 | 19.15 |
| 7. | CUST0000002813 | 1 | 1 | 8.71 |
| 8. | CUST0000003252 | 1 | 1 | 2.58 |
| 9. | CUST0000003287 | 1 | 1 | 1.82 |
| ... | CUST0000004088 | 3 | 10 | 126.48 |

1 - 100 / 2614 < >

NOTE: Actually, it should range by Total_SPEND (Range by cust_code to show color condition)

INTERPRETING K-MEANS RESULTS for Q2/2008

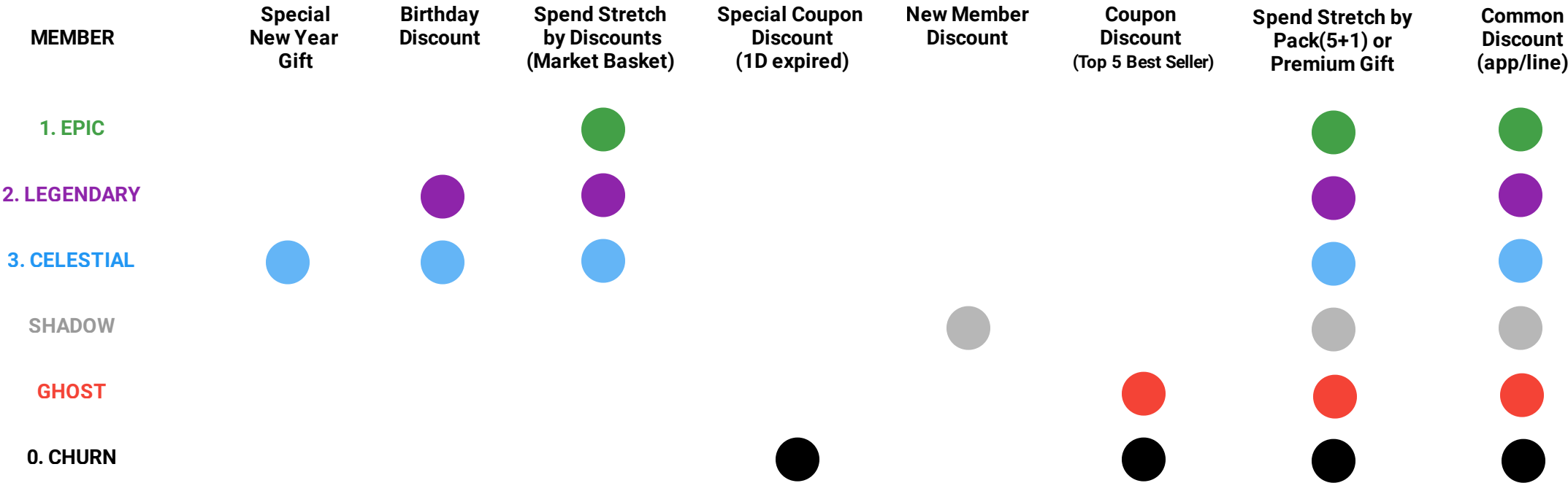
| | EPIC | LEGENDARY | CELESTIAL | SHADOW | GHOST |
|------------------|---|-----------|--|--------|--|
| TOTAL_SPEND | 42,799 | 49,046 | 77,343 | 33,282 | - |
| CUSTOMER SIZE | 2,060 | 108 | 446 | - | 3,464 (only member) |
| # of Transaction | 4,457 | 3,590 | 5,651 | 2,792 | - |
| Recommendations | <ul style="list-style-type: none"> - Up spend strategies by - Cross sell by apply product association analysis (Page 3) with spend stretch discounts eg. "Buy for amount X to get discount Y" - Up sell by premium gift "Buy for amount X to get premium gift" - More engagement by - Daily promotional specials to encourage more visits (expire in short time frame) | | <ul style="list-style-type: none"> - Target: Maintain their loyalty - Communication on new product, discount coupon, activities can be rolled out to keep the retailer brand top of mind. - Create special image for Legendary member | | <ul style="list-style-type: none"> - Promote membership via "Coupon for new member only" |
| | | | | | <ul style="list-style-type: none"> - Coupon discount on Top 5 best seller by segment (Page 3) - Identify cause for churn |

CREATING VALUE FROM CLUSTERING RESULTS

| | CUST_CODE ^ | CENTROID_ID (3 Month) | End_JUN_08 | GAP_Visiting | Special_New_Year_Gift | Birthday_Discount | Market_Basket_discount | 1D_Coupon | Best_Seller_Discount | CLV |
|-----|----------------|--------------------------|-------------|--------------|-----------------------|-------------------|------------------------|-----------|----------------------|---------|
| 1. | CUST0000000181 | 0. CHURN | GONE | >90 | 0 | 0 | 0 | 0 | 1 | 2.24 |
| 2. | CUST0000000369 | 2. LEGENDARY | REPEAT | 2 | 0 | 1 | 1 | 0 | 0 | 397.25 |
| 3. | CUST0000000689 | 1. EPIC | REPEAT | 23 | 0 | 0 | 1 | 0 | 0 | 267.95 |
| 4. | CUST0000000998 | 0. CHURN | GONE | >90 | 0 | 0 | 0 | 0 | 1 | 1.26 |
| 5. | CUST0000001163 | 1. EPIC | NEW | 0 | 0 | 0 | 1 | 0 | 0 | 17.23 |
| 6. | CUST0000001194 | 2. LEGENDARY | REPEAT | 3 | 0 | 1 | 1 | 0 | 0 | 1,004.5 |
| 7. | CUST0000002257 | 0. CHURN | GONE | >90 | 0 | 0 | 0 | 0 | 1 | 1.72 |
| 8. | CUST0000002499 | 0. CHURN | GONE | >90 | 0 | 0 | 0 | 0 | 1 | 1.52 |
| 9. | CUST0000002605 | 1. EPIC | REACTIVATED | 49 | 0 | 0 | 1 | 0 | 0 | 11.44 |
| 10. | CUST0000002637 | 1. EPIC | CHURN | 46 | 0 | 0 | 1 | 1 | 1 | 62.74 |

NOTE:
- New member have to promote in another way
- Spend stretch by pack (5+1)/Premium Gift and
and common discount (app/line) are applied for all

CREATING VALUE FROM CLUSTERING RESULTS



MARKET BASKET ANALYSIS

| | antecedents | consequents | antecedent support | consequent support | support | confidence | lift | leverage | conviction |
|---|--------------|--------------|--------------------|--------------------|----------|------------|----------|----------|------------|
| 1 | (PRD0900531) | (PRD0903052) | 0.022490 | 0.145505 | 0.012821 | 0.570055 | 3.917766 | 0.009548 | 1.987451 |
| 3 | (PRD0901265) | (PRD0903052) | 0.061013 | 0.145505 | 0.025425 | 0.416709 | 2.863878 | 0.016547 | 1.464954 |
| 5 | (PRD0903074) | (PRD0903052) | 0.039234 | 0.145505 | 0.012728 | 0.324409 | 2.229540 | 0.007019 | 1.264812 |
| 8 | (PRD0904250) | (PRD0903052) | 0.031356 | 0.145505 | 0.010009 | 0.319212 | 2.193819 | 0.005447 | 1.255155 |
| 2 | (PRD0900830) | (PRD0903052) | 0.044362 | 0.145505 | 0.013346 | 0.300836 | 2.067527 | 0.006891 | 1.222166 |
| 4 | (PRD0901265) | (PRD0903678) | 0.061013 | 0.141736 | 0.015879 | 0.260253 | 1.836180 | 0.007231 | 1.160213 |
| 9 | (PRD0904358) | (PRD0903052) | 0.104078 | 0.145505 | 0.026568 | 0.255269 | 1.754362 | 0.011424 | 1.147387 |
| 6 | (PRD0903678) | (PRD0903052) | 0.141736 | 0.145505 | 0.033550 | 0.236704 | 1.626778 | 0.012926 | 1.119481 |
| 7 | (PRD0903052) | (PRD0903678) | 0.145505 | 0.141736 | 0.033550 | 0.230573 | 1.626778 | 0.012926 | 1.115459 |
| 0 | (PRD0900121) | (PRD0903052) | 0.081804 | 0.145505 | 0.018505 | 0.226208 | 1.554643 | 0.006602 | 1.104296 |

NOTE:
- Market basket analysis: Ranking by confidence
- Raw data is not provided "Product name"
- Query data by SQL and simulate by Python

TOP 5 BEST SELLER

NOTE:
- Top 5 Best Seller: Separate by CUST_LIFESTAGE
- Raw data have only 1 store type "LS"

Young Adult (YA) LIFESTAGE

| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0904358 | 389.6 |
| 2. | PRD0903052 | 197.7 |
| 3. | PRD0900121 | 192.1 |
| 4. | PRD0900722 | 145.2 |
| 5. | PRD0903815 | 130.1 |

Young Family (YF) LIFESTAGE

| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0903269 | 796.2 |
| 2. | PRD0904358 | 649.9 |
| 3. | PRD0901265 | 299.1 |
| 4. | PRD0903052 | 260.5 |
| 5. | PRD0900121 | 245 |

Persioners (PE) LIFESTAGE

| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0904358 | 175.6 |
| 2. | PRD0900121 | 158.8 |
| 3. | PRD0903052 | 142.2 |
| 4. | PRD0901265 | 120.1 |
| 5. | PRD0904250 | 109.6 |

Old Adult (OA) LIFESTAGE

| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0904358 | 389.6 |
| 2. | PRD0903052 | 279.1 |
| 3. | PRD0900121 | 275.4 |
| 4. | PRD0904250 | 261.5 |
| 5. | PRD0902503 | 253.3 |

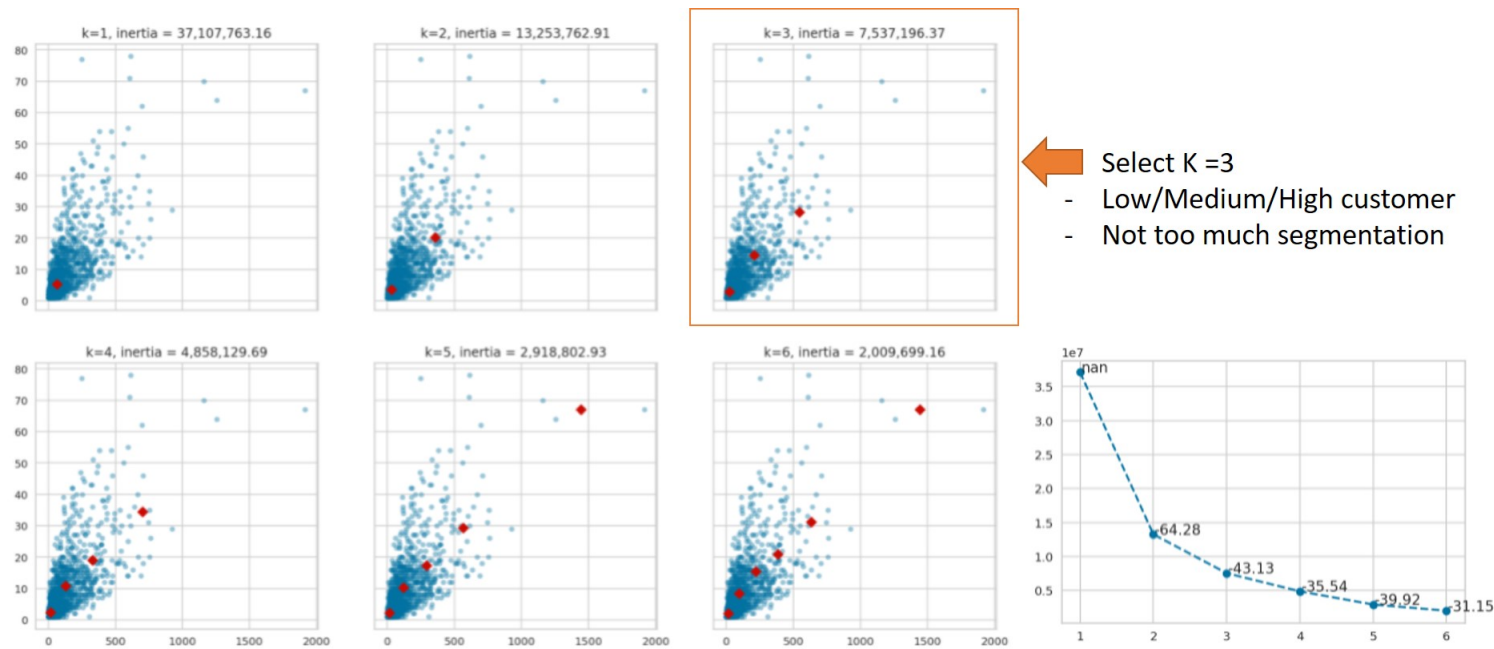
OldFamily (OF) LIFESTAGE

| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0904358 | 229.5 |
| 2. | PRD0901923 | 102 |
| 3. | PRD0904933 | 88.3 |
| 4. | PRD0901310 | 87.6 |
| 5. | PRD0902129 | 72.5 |

Others (OT) LIFESTAGE

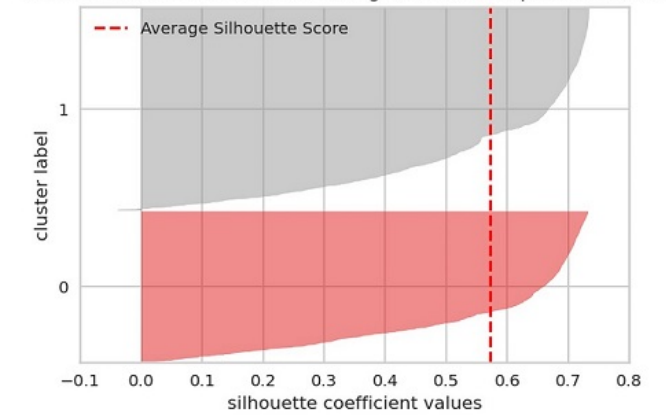
| | PROD_CODE | USD ▾ |
|----|------------|-------|
| 1. | PRD0904358 | 827 |
| 2. | PRD0900121 | 515.5 |
| 3. | PRD0903052 | 418.7 |
| 4. | PRD0901265 | 339.1 |
| 5. | PRD0900324 | 275.2 |

Amount of centroid selection

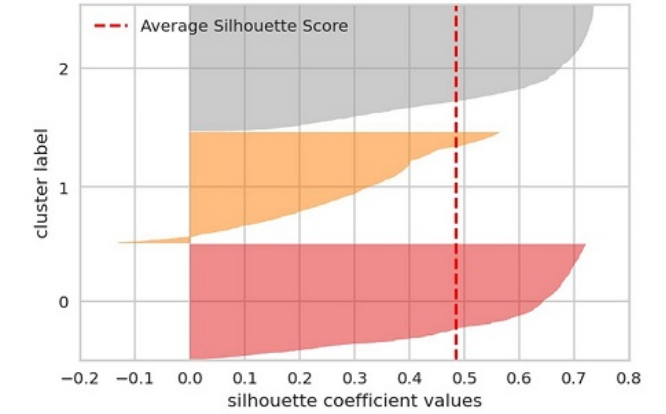


Silhouette analysis

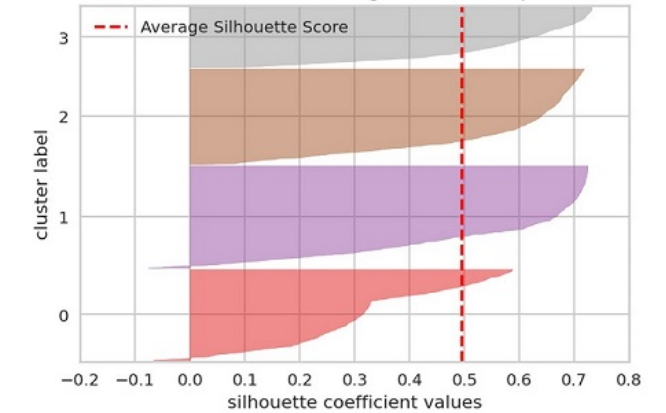
Silhouette Plot of KMeans Clustering for 2614 Samples in 2 Centers



Silhouette Plot of KMeans Clustering for 2614 Samples in 3 Centers



Silhouette Plot of KMeans Clustering for 2614 Samples in 4 Centers



K mean, Spending and Visiting

