

CUSTOMER SEGMENTATION BASED ON RFMV MODEL - APPLICATION IN ADVENTUREWORKS CYCLES COMPANY

GROUP 3

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INTRODUCTION PROJECT

01

Objectives

Customer segmentation based on RFMV, suggesting implications for customer segments, proposing marketing strategies for each segment.

02

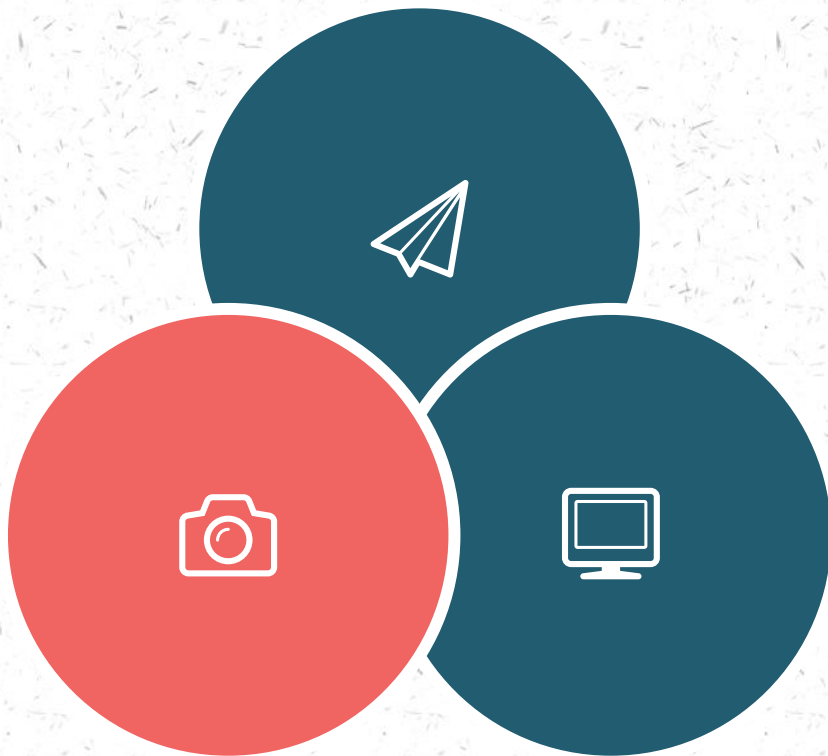
Objects

Use with RFMV model to segment customers through data from the dataset.

03

Scopes

Using fictitious data from Adventureworks Cycles from 2014 to 2018.



LITERATURE REVIEW



RFM (Recency, Frequency, Monetary)

RFM modeling is a frequently applied segmentation technique consisting of three measures, combined into a three-digit RFM cell code. Then use the quintile to split the score and segment the customer.



RFMV (Recency, Frequency, Monetary, and Variety)

Qadaki Moghaddam, Abdolvand & Rajaee Harandi (2017) introduced this model. Since product variety is one of the key parameters for assessing customer behavior, studying this factor in the B2B sector is an important new approach.

METHODOLOGY

**Research
Design**

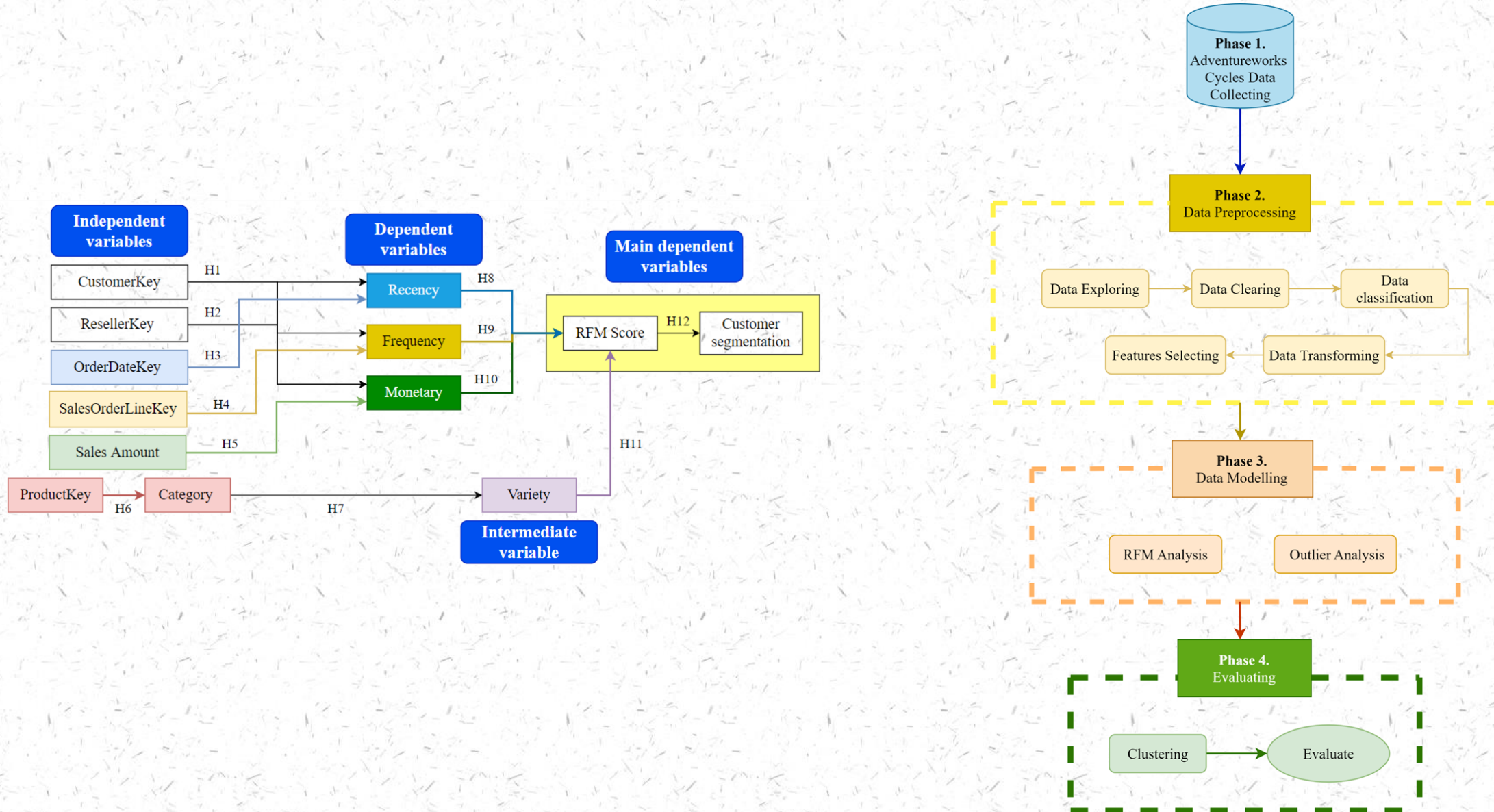
**Research
Instrument**

**Population and
Sample selection**

**Data
Collection
Procedure**

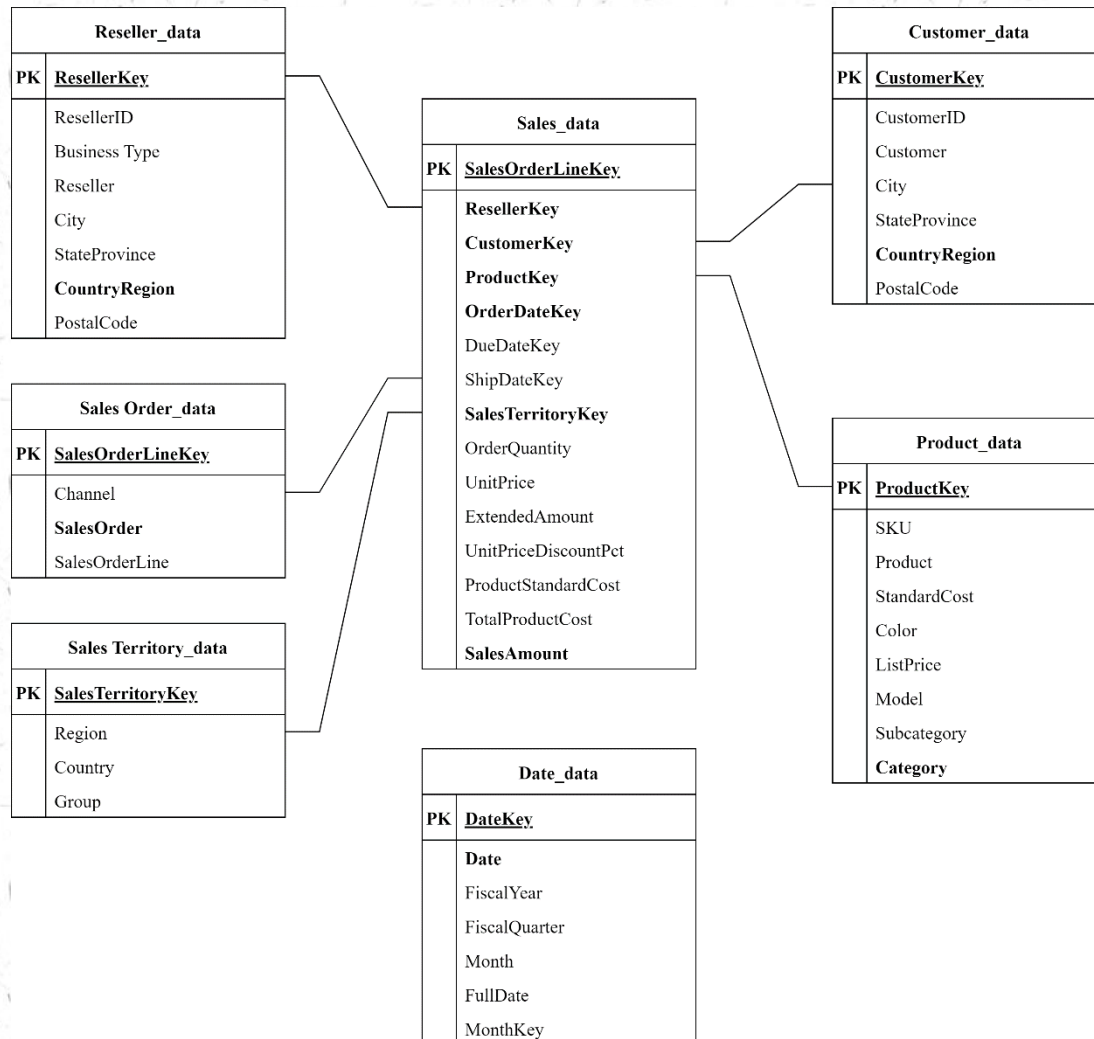


IMPLEMENTATION PROCESS



EXPERIMENT ON DATA

Data overview

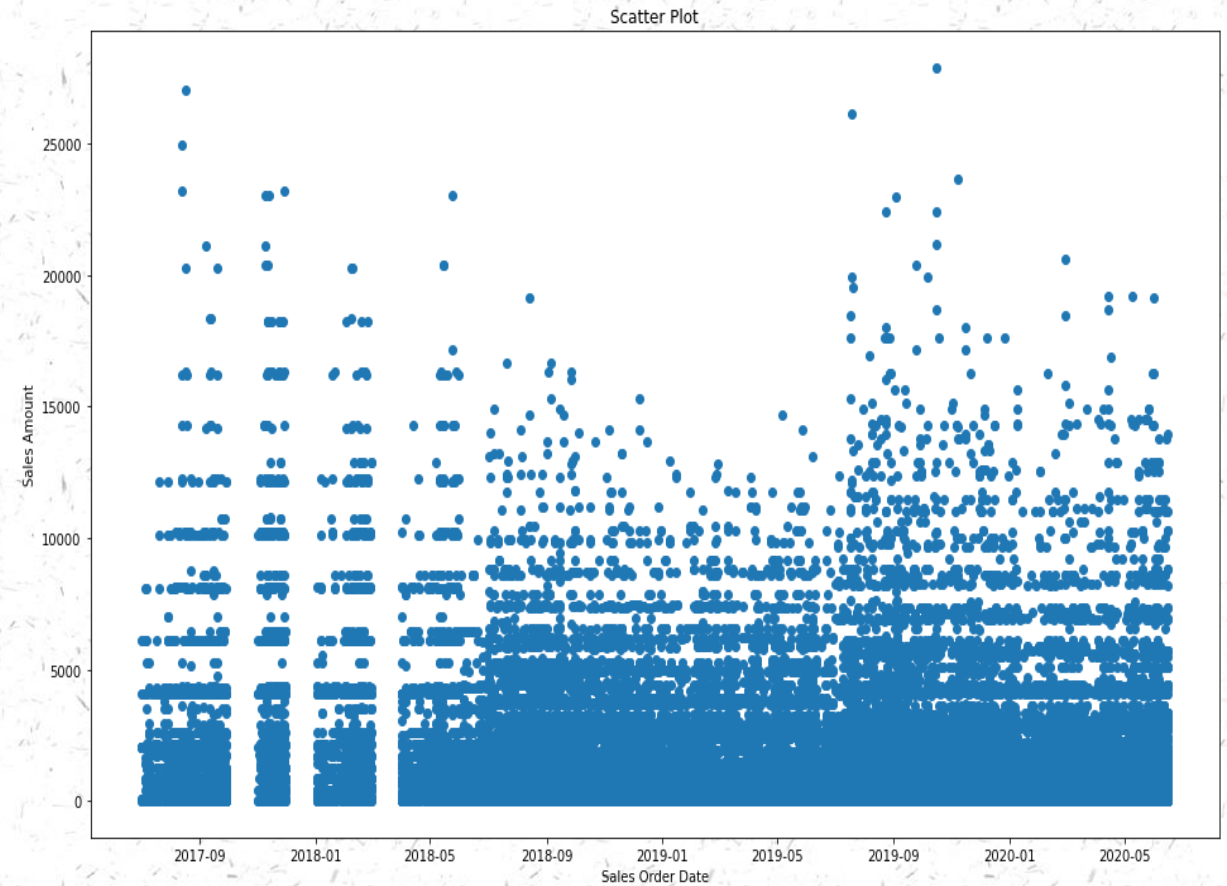
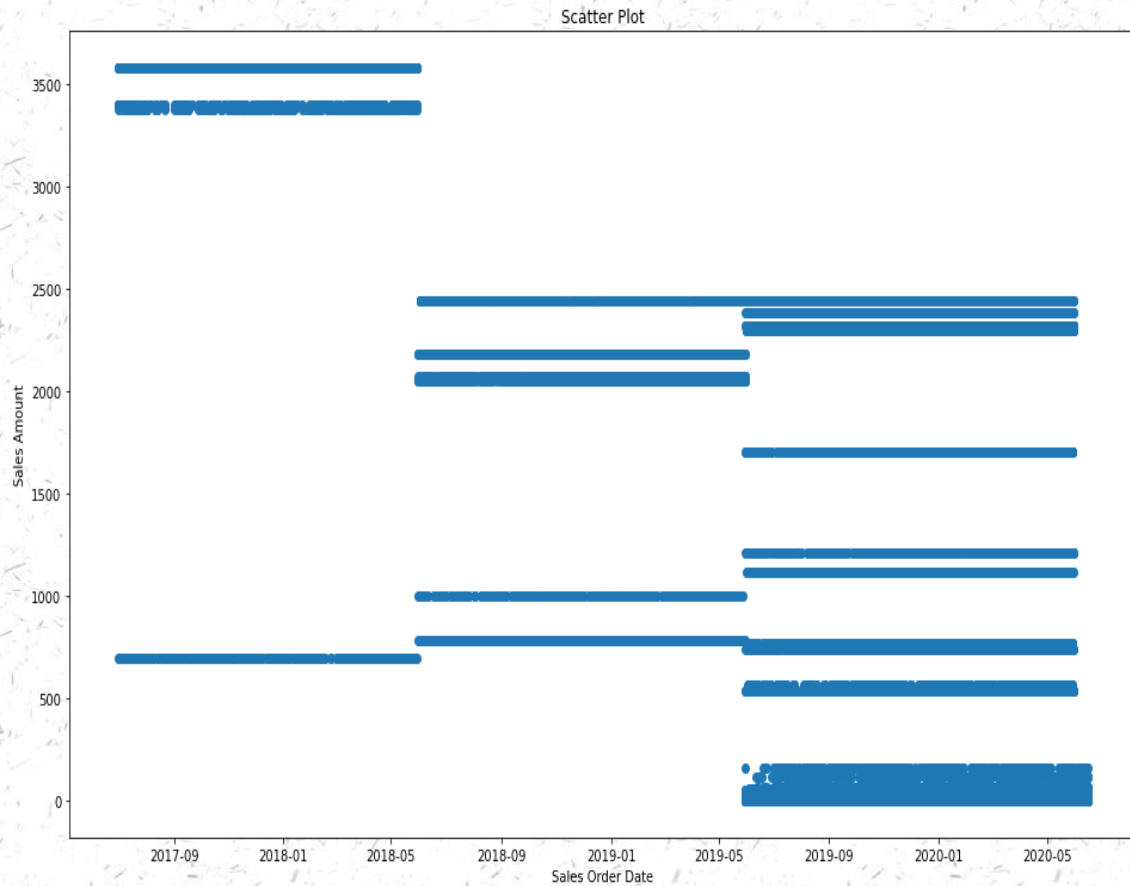


```
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Data columns (total 17 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   SalesOrderLineKey                    121253 non-null int64
1   ResellerKey                          121253 non-null int64
2   CustomerKey                          121253 non-null int64
3   ProductKey                           121253 non-null int64
4   OrderDateKey                         121253 non-null int64
5   DueDateKey                           121253 non-null int64
6   ShipDateKey                          119140 non-null float64
7   SalesTerritoryKey                    121253 non-null int64
8   Order Quantity                       121253 non-null int64
9   Unit Price                           121253 non-null float64
10  Extended Amount                      121253 non-null float64
11  Unit Price Discount Pct              121253 non-null int64
12  Product Standard Cost                121253 non-null float64
13  Total Product Cost                   121253 non-null float64
14  Sales Amount                         121253 non-null float64
15  Sales Order                          121253 non-null object
16  Category                             121253 non-null object

dtypes: float64(6), int64(9), object(2)
memory usage: 16.7+ MB
```

EXPERIMENT ON DATA

Analysis of EDA



EXPERIMENT ON DATA

Analysis of RFM

show_rfm(rfm_customer)

Result RFM Bikes				
	CustomerKey	Recency	Frequency	Monetary
0	11000	239	3	8104.0500
1	12447	239	1	2294.9900
2	13280	239	2	4501.5525
3	13367	239	2	4501.5525
4	14134	239	2	3750.0882

Result RFM Clothing

	CustomerKey	Recency	Frequency	Monetary
0	11000	255	1	53.99
1	13974	255	1	53.99
2	14076	255	1	49.99
3	14134	255	1	49.99
4	14928	255	1	8.99

Result RFM Accessories

	CustomerKey	Recency	Frequency	Monetary
0	11000	255	2	90.95
1	11504	255	2	44.57
2	12247	255	1	27.28
3	12447	255	1	36.96
4	13280	255	1	56.97

show_rfm(rfm_reseller)

Result RFM Bikes				
	ResellerKey	Recency	Frequency	Monetary
0	1	770	4	80585.7344
1	584	770	4	121582.3422
2	2	123	7	19233.1306
3	411	123	1	1376.9940
4	3	5	12	289721.3971

Result RFM Clothing

	ResellerKey	Recency	Frequency	Monetary
0	1	770	1	28.8404
1	36	770	1	28.8404
2	584	770	4	1663.3902
3	2	30	8	3690.9333
4	99	30	6	219.2760

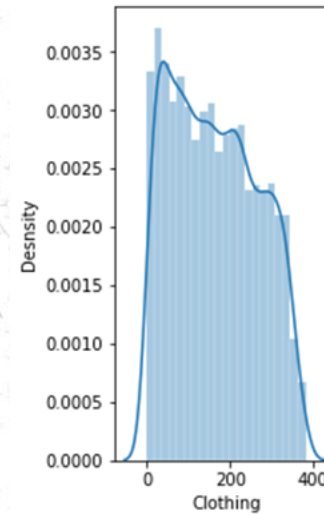
Result RFM Accessories

	ResellerKey	Recency	Frequency	Monetary
0	1	863	1	40.3730
1	2	30	4	1160.6385
2	138	30	3	1131.4080
3	3	5	12	8764.7677
4	5	5	4	194.0245

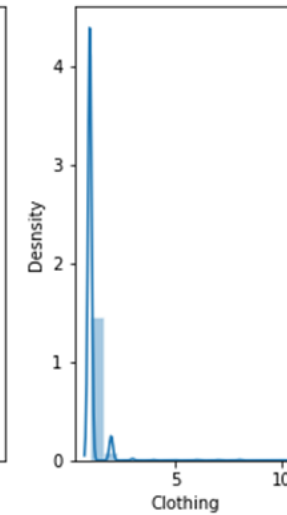
Result RFM Components

	ResellerKey	Recency	Frequency	Monetary
0	1	770	3	4522.1334
1	584	770	4	13622.2884
2	2	313	2	1114.7970
3	3	5	12	43280.9935
4	5	5	6	6443.9380

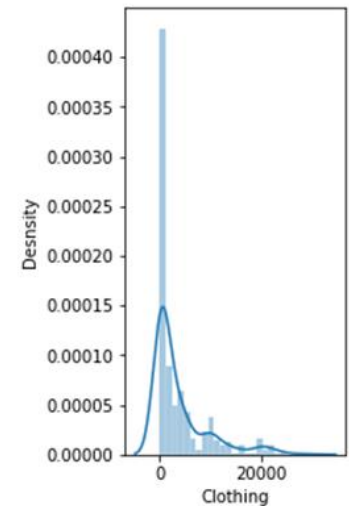
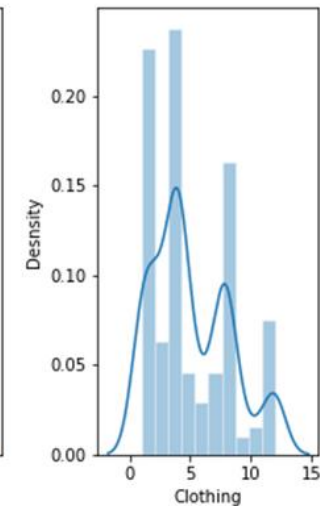
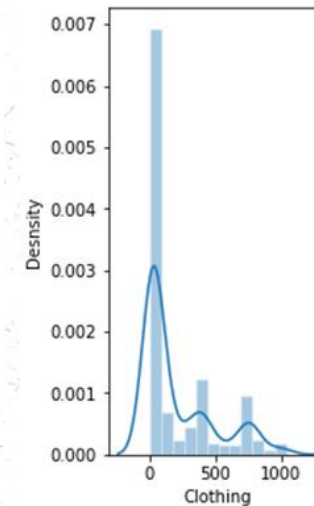
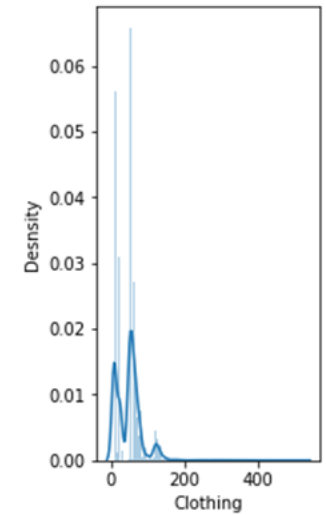
Distribution of Recency



Distribution of Frequency



Distribution of Monetary



Distributions of RFM values of Clothing category

EXPERIMENT ON DATA

Label

Table 4.3. The rule to segment the customer based on RFM Score

Segmentation	RFM Score
Champions	555, 554, 544, 545, 454, 455, 445
Loyal	543, 444, 435, 355, 354, 345, 344, 335
Potential Loyalist	553, 551, 552, 541, 542, 533, 532, 531, 452, 451, 442, 441, 431, 453, 433, 432, 423, 353, 352, 351, 342, 341, 333, 323
New Customers	512, 511, 422, 421, 412, 411, 311
Promising	525, 524, 523, 522, 521, 515, 514, 513, 425, 424, 413, 414, 415, 315, 314, 313
Need Attention	535, 534, 443, 434, 343, 334, 325, 324
About To Sleep	331, 321, 312, 221, 213, 231, 241, 251
At Risk	255, 254, 245, 244, 253, 252, 243, 242, 235, 234, 225, 224, 153, 152, 145, 143, 142, 135, 134, 133, 125, 124
Cannot Lose Them	155, 154, 144, 214, 215, 115, 114, 113
Hibernating customers	332, 322, 233, 232, 223, 222, 132, 123, 122, 212, 211
Lost customers	111, 112, 121, 131, 141, 151

Segmentation of: Bikes

	CustomerKey	R	F	M	RFM_Score	Segment
0	11000	2	5	5	255	At Risk
1	12447	2	1	2	212	Hibernating customers
2	13280	2	3	4	234	At Risk
3	13367	2	3	4	234	At Risk
4	14134	2	3	4	234	At Risk

Segmentation of: Clothing

	CustomerKey	R	F	M	RFM_Score	Segment
0	11000	2	1	3	213	Ablout To Sleep
1	13974	2	1	3	213	Ablout To Sleep
2	14076	2	1	2	212	Hibernating customers
3	14134	2	1	2	212	Hibernating customers
4	14928	2	1	1	211	Hibernating customers

Segmentation of: Accessories

	CustomerKey	R	F	M	RFM_Score	Segment
0	11000	2	5	5	255	At Risk
1	11504	2	5	4	254	At Risk
2	12247	2	1	2	212	Hibernating customers
3	12447	2	1	3	213	Ablout To Sleep
4	13280	2	1	4	214	Cannot Lose Them

Segmentation of: Bikes

	ResellerKey	R	F	M	RFM_Score	Segment
0	1	1	2	3	123	Hibernating customers
1	584	1	2	4	124	At Risk
2	2	2	4	2	242	At Risk
3	411	2	1	1	211	Hibernating customers
4	3	5	5	5	555	Champions

Segmentation of: Clothing

	ResellerKey	R	F	M	RFM_Score	Segment
0	1	1	1	1	111	Lost customers
1	36	1	1	1	111	Lost customers
2	584	1	3	3	133	At Risk
3	2	4	5	4	454	Champions
4	99	4	4	2	442	Potential Loyalist

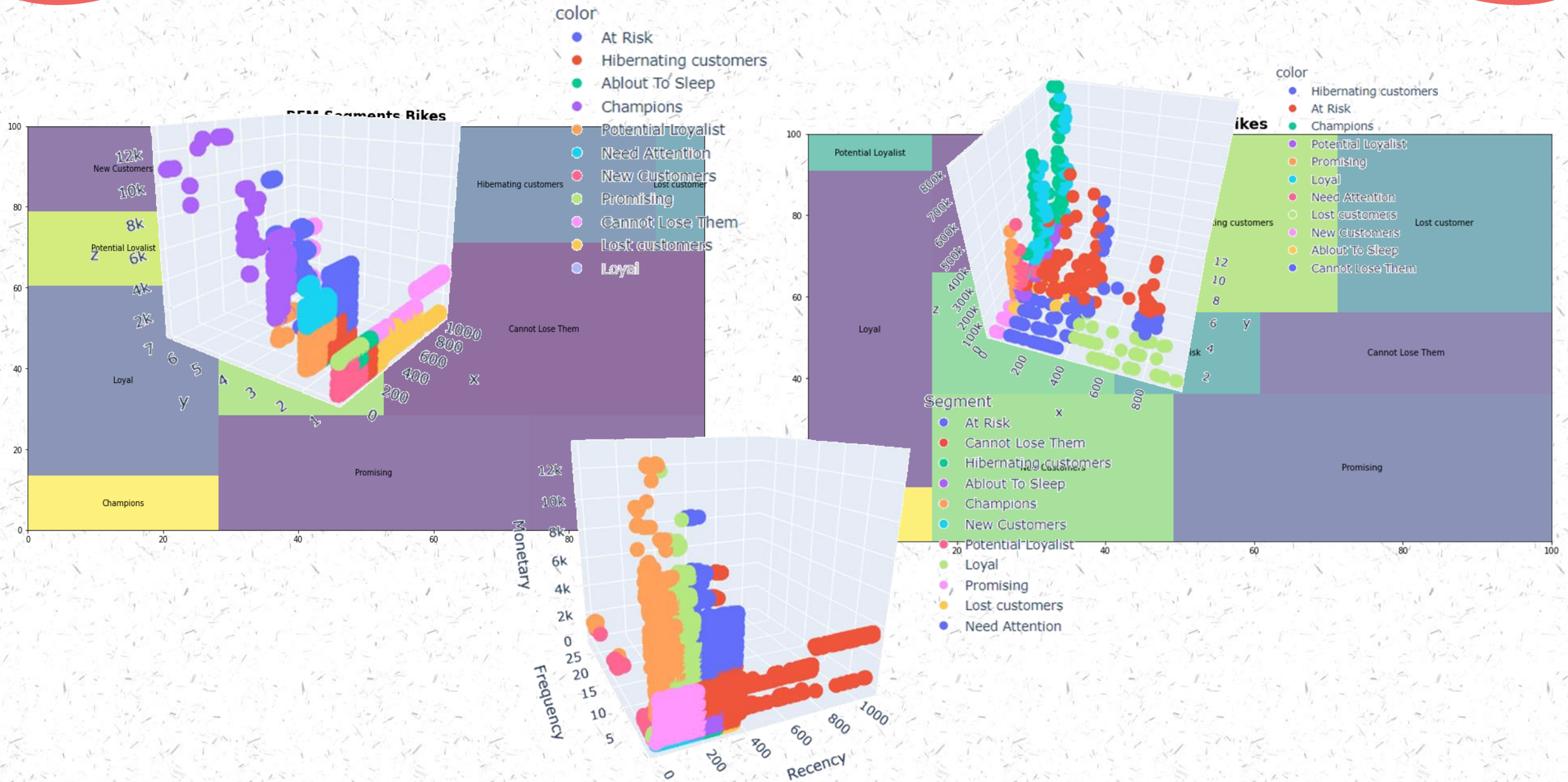
Segmentation of: Accessories

	ResellerKey	R	F	M	RFM_Score	Segment
0	1	1	1	1	111	Lost customers
1	2	4	3	4	434	Need Attention
2	138	4	2	4	424	Promising
3	3	5	5	5	555	Champions
4	5	5	3	2	532	Potential Loyalist

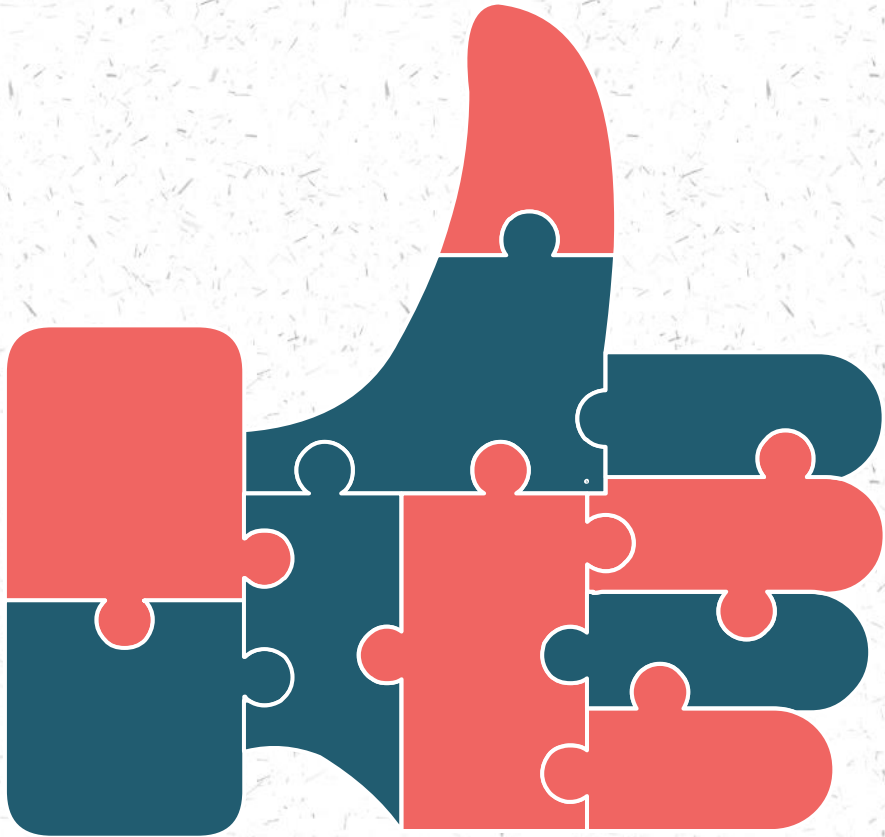
Segmentation of: Components

	ResellerKey	R	F	M	RFM_Score	Segment
0	1	1	2	3	123	Hibernating customers
1	584	1	3	4	134	At Risk
2	2	2	1	2	212	Hibernating customers
3	3	5	5	5	555	Champions
4	5	5	4	3	543	Loyal

EXPERIMENT RESULTS



CONCLUSION AND FUTURE WORKS



Conclusion



Limitation



Plan for future

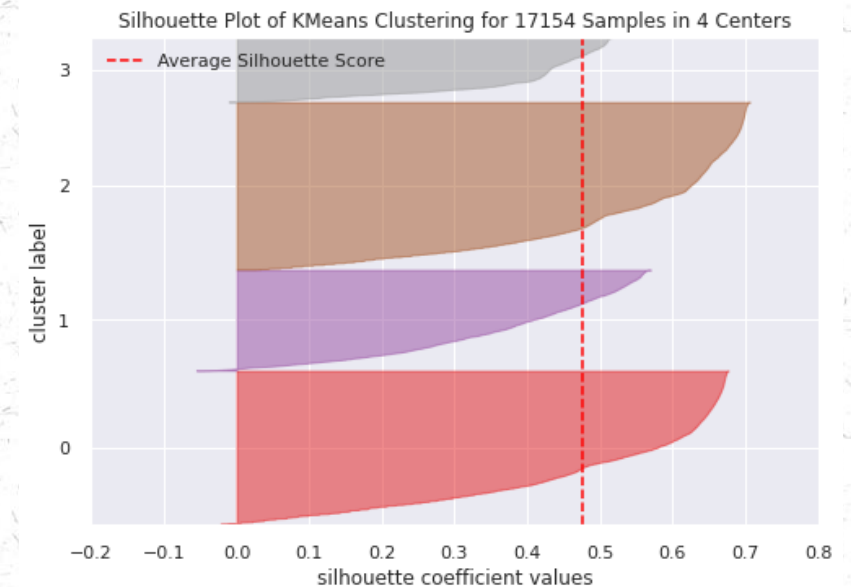
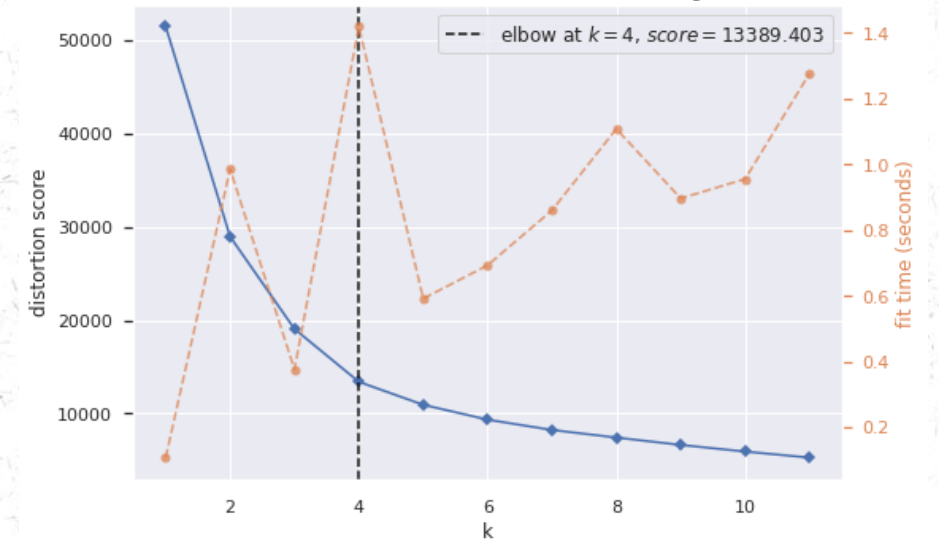
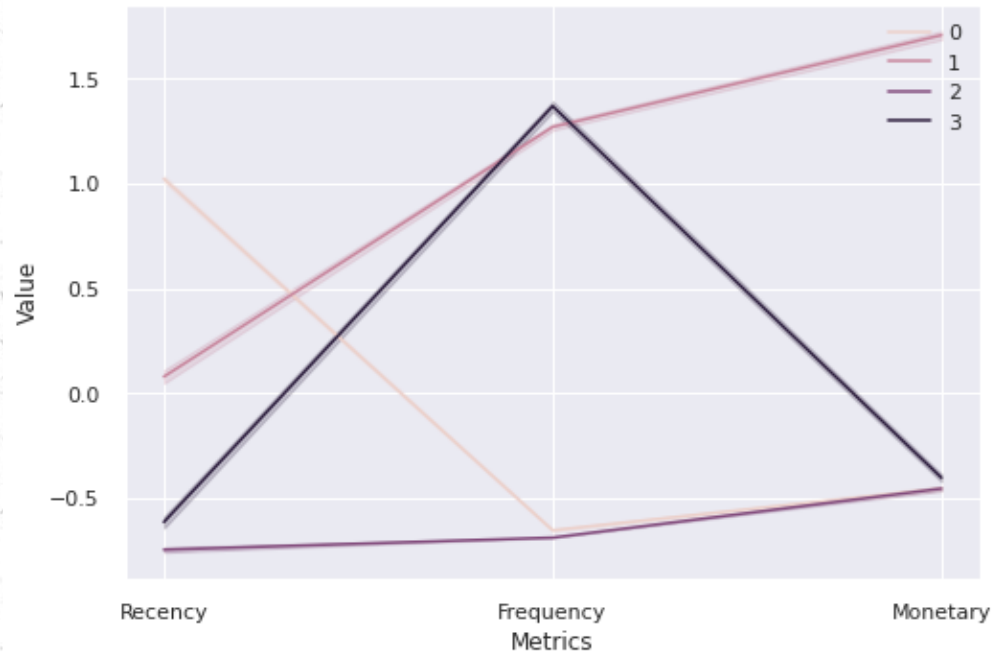
APPENDIX 1

Data scaling

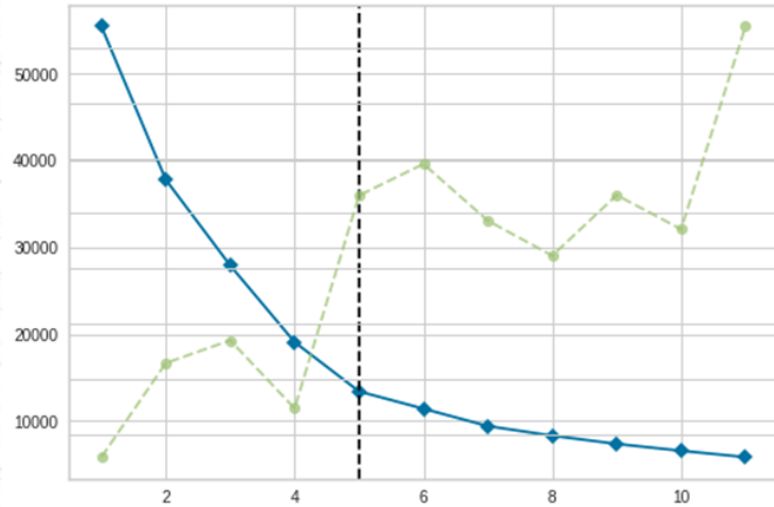
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       [ 0.88349196, -0.6897019 ,  0.57709456],  
       ...,  
       [ 2.18856733, -0.6897019 , -0.29616958],  
       [ 2.3124066 , -0.6897019 , -0.29616958],  
       [ 3.04591612, -0.6897019 ,  0.41762993]])
```

Testing of clusters using Elbow and Silhouette

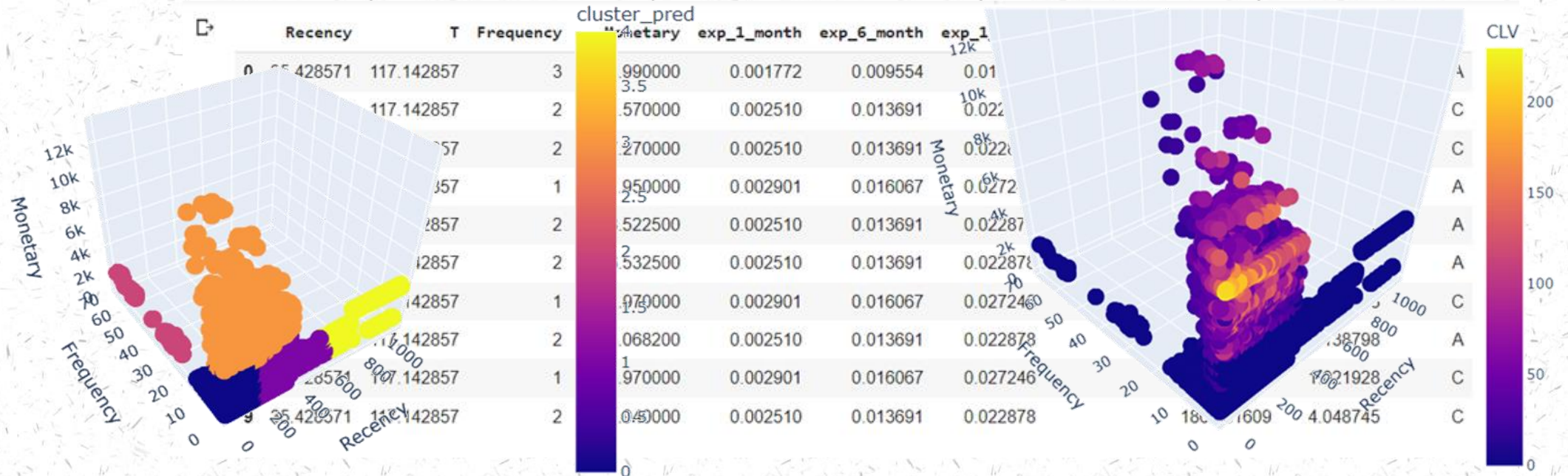
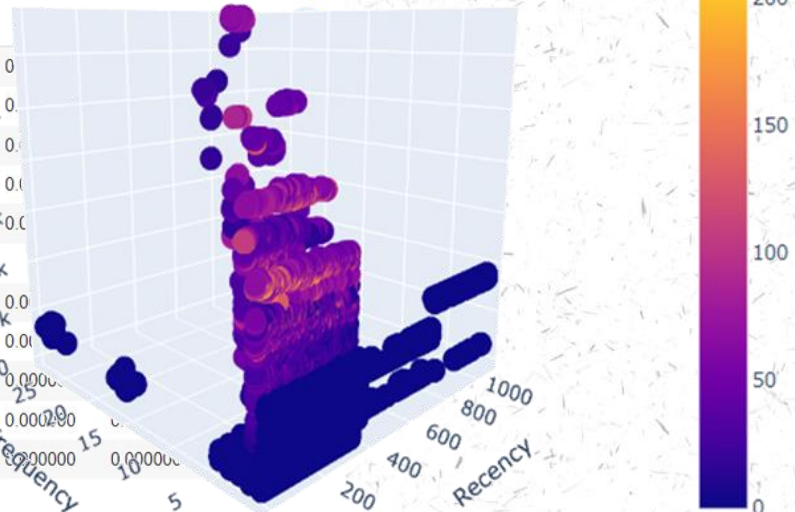
Snake Plot of Clusters



APPENDIX 2



	APV	CV	CL_day	CL_month	CL_year
10	9.211312	1435.159319	814	27.133333	2.228071
0.9	4.171264	830.525643	1038	34.600000	2.841888
0.8	3.720025	2822.276676	752	25.066667	2.058864
0.7	5.236267	1258.791389	832	27.733333	2.777892
0.6	3.650850	1907.127464	810	27.000000	2.176550
0.5
0.4	3.288200	3082.272274	0	0.000000	0.000000
0.3	16.970980	610.943154	0	0.000000	0.000000
0.2	6.895600	4825.878622	0	0.000000	0.000000
0.1	3.288200	3082.272274	0	0.000000	0.000000
0.0	3.288200	3082.272274	0	0.000000	0.000000



THANK YOU!

FINAL PROJECT REPORTING

GROUP 3
