Project

MRA

Milestone – 1

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Problem statement

An automobile parts manufacturing company has collected data of transactions for 3 years. They do not have any in-house data science team, thus they have hired you as their consultant. Your job is to use your magical data science skills to provide them with suitable insights about their data and their customers.

Data Dictionary:

ORDERNUMBER :	Order Number	CUSTOMERNAME :	customer
QUANTITYORDERED :	Quantity ordered	PHONE :	Phone of the customer
PRICEEACH :	Price of Each item	ADDRESSLINE1 :	Address of customer
ORDERLINENUMBER :	order line	CITY :	City of customer
SALES :	Sales amount	POSTALCODE :	Postal Code of customer
ORDERDATE :	Order Date	COUNTRY :	Country customer
DAYS_SINCE_LASTORDER :	Days_ Since_Lastorder	CONTACTLASTNAME :	Contact person customer
STATUS :	Status of order like Shipped or not	CONTACTFIRSTNAME :	Contact person customer
PRODUCTLINE :	Product line – CATEGORY	DEALSIZE :	Size of the deal based on Qu Item Price
MSRP :	Manufacturer's Suggested Retail Price		
PRODUCTCODE :	Code of Product		

Content

- **Agenda**
- **Executive summary of data**
- **Summary of dataset(info, describe, null value, duplicates)**
- **Hist plot**
- **Box plot**
- **Correlation of dataset ,Skewness**
- **Pairplot**
- **KNIME Workflow image**
- **OUTPUT of Head**

Agenda

The project is to find the different segment of customers based on the buying patterns of customers of an automobile manufacturer based on the past 3 years transaction data of the company. There by providing the recommendation for customizing the marketing strategies based on different segments of customers.

Executive Summary of the data

Time period of the data is from Jan 2018 till May 2020 that is 29 months. There are about 2747 entries with 20 different variable detailing the demography of the product and customer information.

Question 1

Agenda & Executive Summary of the data -> Contents of the PPT -> Problem statement -> About Data(info, Shape, Summary Stats, your assumptions about data)

Answer:

Agenda

The project is to find the different segment of customers based on the buying patterns of customers of an automobile manufacturer based on the past 3 years transaction data of the company. There by providing the recommendation for customizing the marketing strategies based on different segments of customers.

Executive Summary of the data

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Contents of PPT

- **Agenda**
- **Executive summary of data**
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Head and Tail of Dataset

	ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	DAYS_SINCE_LASTORDER	STATUS	PRODUCTLINE	MSRP
0	10107	30	95.70	2	2871.00	2018-02-24	828	Shipped	Motorcycles	95
1	10121	34	81.35	5	2765.90	2018-05-07	757	Shipped	Motorcycles	95
2	10134	41	94.74	2	3884.34	2018-07-01	703	Shipped	Motorcycles	95
3	10145	45	83.26	6	3746.70	2018-08-25	649	Shipped	Motorcycles	95
4	10168	36	96.66	1	3479.76	2018-10-28	586	Shipped	Motorcycles	95

```
df.tail()
```

	ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	DAYS_SINCE_LASTORDER	STATUS	PRODUCTLINE	MS
2742	10350	20	112.22	15	2244.40	2019-12-02	2924	Shipped	Ships	
2743	10373	29	137.19	1	3978.51	2020-01-31	2865	Shipped	Ships	
2744	10386	43	125.99	4	5417.57	2020-03-01	2836	Resolved	Ships	
2745	10397	34	62.24	1	2116.16	2020-03-28	2810	Shipped	Ships	
2746	10414	47	65.52	9	3079.44	2020-05-06	2772	On Hold	Ships	

Shape and Info of Dataset

```
(2747, 20)
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 2747 entries, 0 to 2746
Data columns (total 20 columns):
 #   Column                Non-Null Count  Dtype
---  ------                --------------  -----
 0   ORDERNUMBER           2747 non-null   int64
 1   QUANTITYORDERED       2747 non-null   int64
 2   PRICEEACH             2747 non-null   float64
 3   ORDERLINENUMBER       2747 non-null   int64
 4   SALES                 2747 non-null   float64
 5   ORDERDATE             2747 non-null   datetime64[ns]
 6   DAYS_SINCE_LASTORDER  2747 non-null   int64
 7   STATUS                2747 non-null   object
 8   PRODUCTLINE           2747 non-null   object
 9   MSRP                  2747 non-null   int64
 10  PRODUCTCODE           2747 non-null   object
 11  CUSTOMERNAME          2747 non-null   object
 12  PHONE                 2747 non-null   object
 13  ADDRESSLINE1          2747 non-null   object
 14  CITY                  2747 non-null   object
 15  POSTALCODE            2747 non-null   object
 16  COUNTRY               2747 non-null   object
 17  CONTACTLASTNAME       2747 non-null   object
 18  CONTACTFIRSTNAME      2747 non-null   object
 19  DEALSIZE              2747 non-null   object
dtypes: datetime64[ns](1), float64(2), int64(5), object(12)
memory usage: 429.3+ KB
```

Description of Dataset

	count	mean	std	min	25%	50%	75%	max
ORDERNUMBER	2747.0	10259.761558	91.877521	10100.00	10181.000	10264.00	10334.500	10425.00
QUANTITYORDERED	2747.0	35.103021	9.762135	6.00	27.000	35.00	43.000	97.00
PRICEEACH	2747.0	101.098951	42.042548	26.88	68.745	95.55	127.100	252.87
ORDERLINENUMBER	2747.0	6.491081	4.230544	1.00	3.000	6.00	9.000	18.00
SALES	2747.0	3553.047583	1838.953901	482.13	2204.350	3184.80	4503.095	14082.80
DAYS_SINCE_LASTORDER	2747.0	1757.085912	819.280576	42.00	1077.000	1761.00	2436.500	3562.00
MSRP	2747.0	100.691664	40.114802	33.00	68.000	99.00	124.000	214.00

Observation:

1. We can see that there are in the dataset there are 2747 rows and 20 column.

2. As check found that there are no null values in the Sales dataset.

3. From info we can see that the values are of (5 - int),(12 – object),(2 - float),(1 – datetime) type.

4. From description we find the mean, median, max, 25%,50%,75% values.

5. we are detailing the demography of the product and customer information.

Question 2

Exploratory Analysis and Inferences -> Univariate, Bivariate, and multivariate analysis using data visualization (Weekly, Monthly, Quarterly, Yearly Trends in Sales and Sales Across different Categories of different features in the given data) -> Summarise the inferences

Answer:

Univariate analysis/bi-variate analysis

Univariate analysis explores each variable in a data set, separately. It looks at the range of values, as well as the central tendency of the values. It describes the pattern of response to the variable. It describes each variable on its own. Bivariate analysis is one of the simplest forms of quantitative (statistical) analysis. It involves the analysis of two variables (often denoted as X, Y), for the purpose of determining the empirical relationship between them. ... It is the analysis of the relationship between the two variables.

Histogram Plot
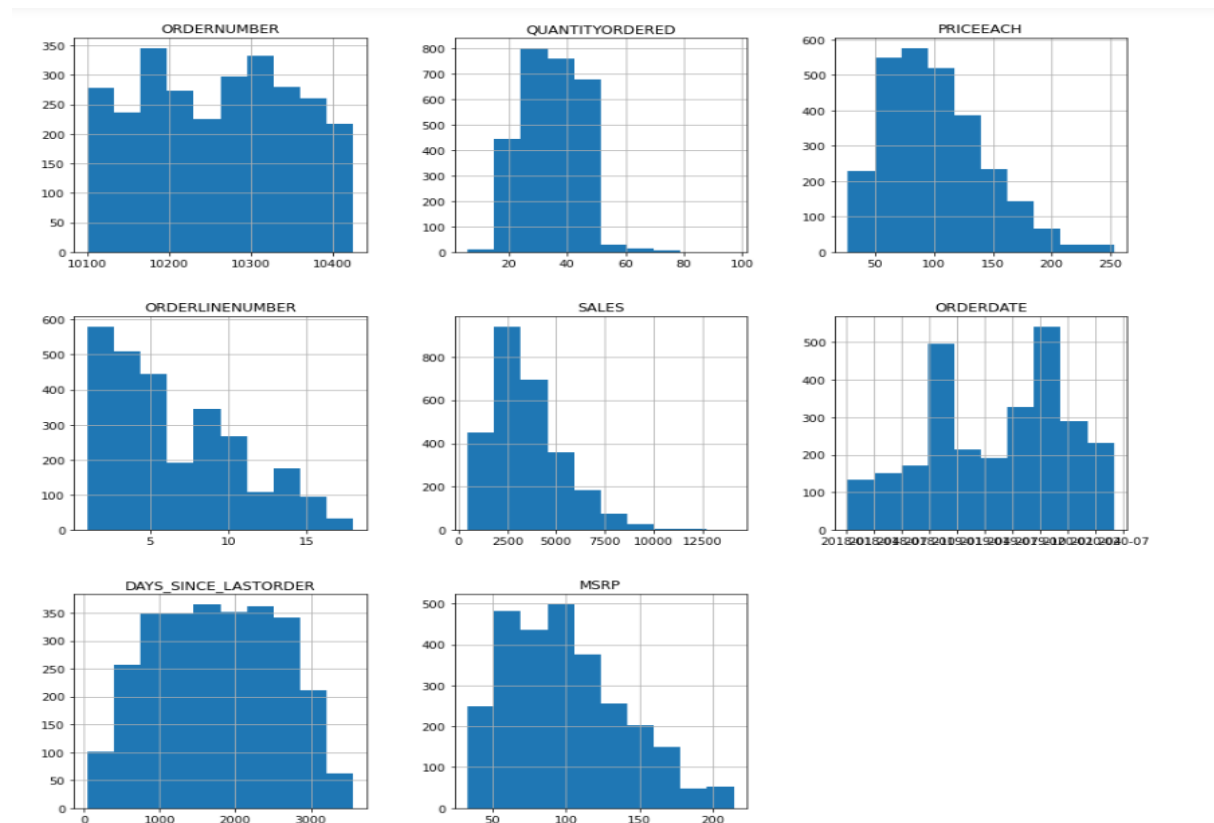
Box plot for Dataset
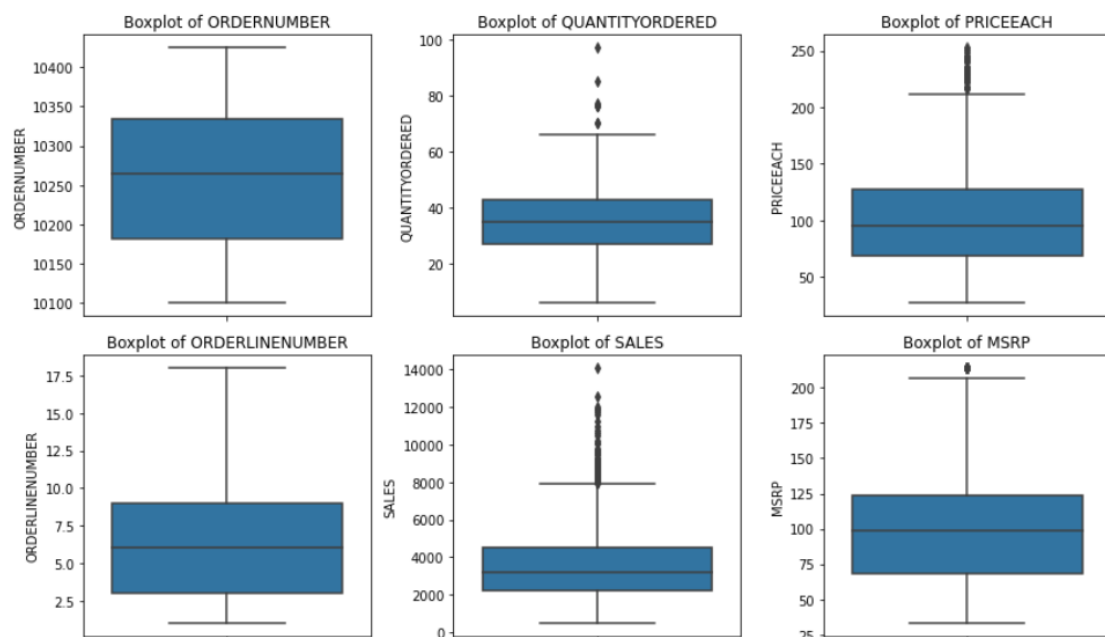
From above we can see that the outliers are in Quantity ordered , Price Each, Sales and MSRP

```
ORDERNUMBER        -0.006995
QUANTITYORDERED     0.369286
PRICEEACH           0.697222
ORDERLINENUMBER     0.575327
SALES               1.155940
MSRP                0.575646
dtype: float64
```

As from above we can also see the skewness of sales is higher as compared to others and skewness of order number Is low .
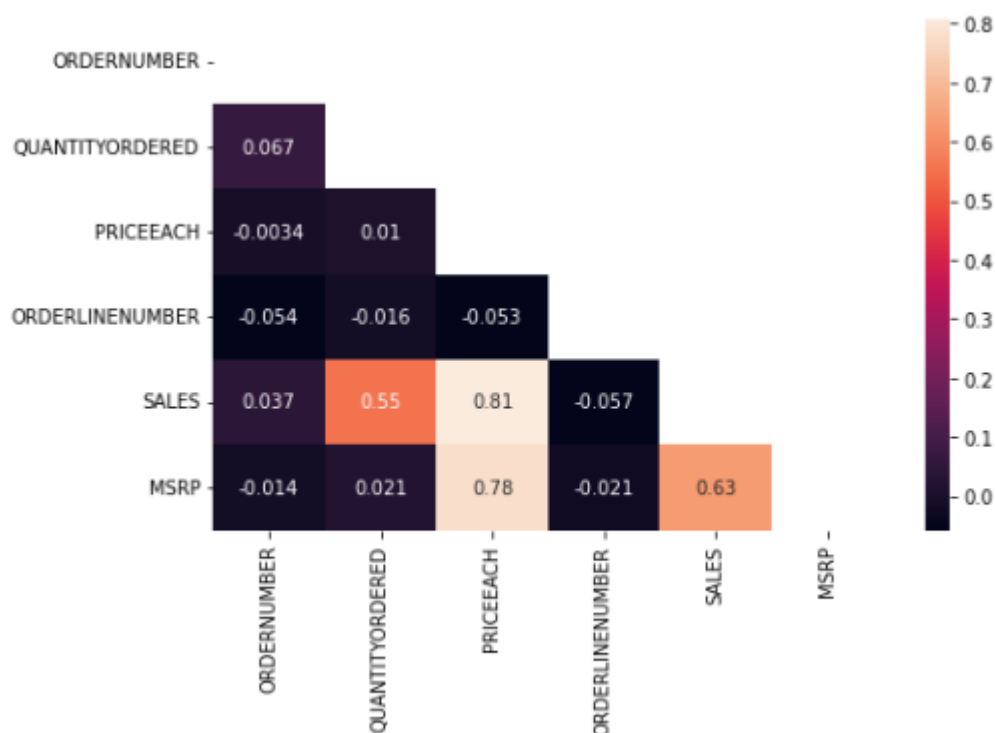
Correlation between the orders ,quantity and sales
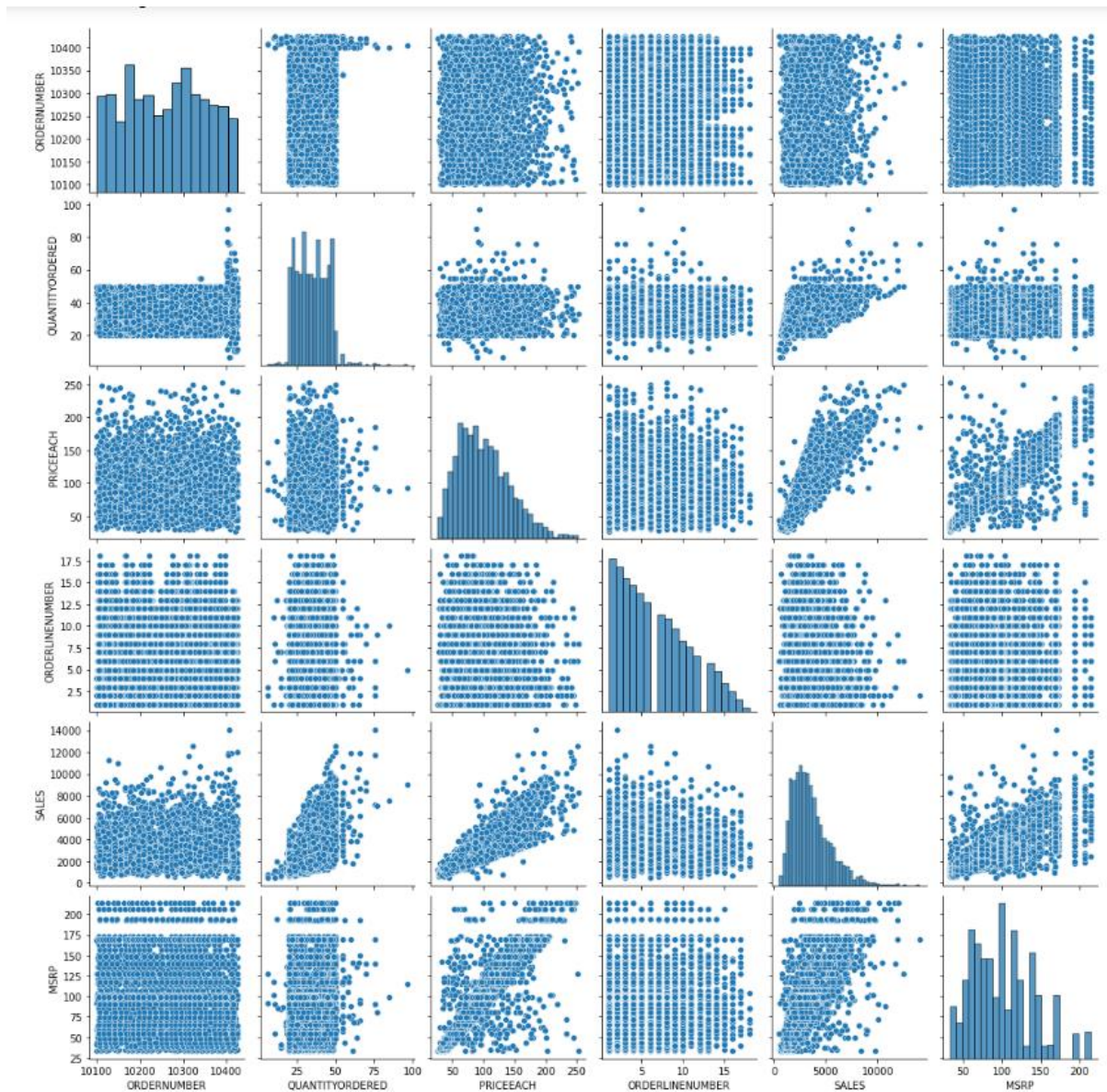
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Weekly, Monthly, Quarterly, Yearly Trends in Sales and Sales Across different Categories of different features in the given data)

The work given in tableau

Year – Quarter
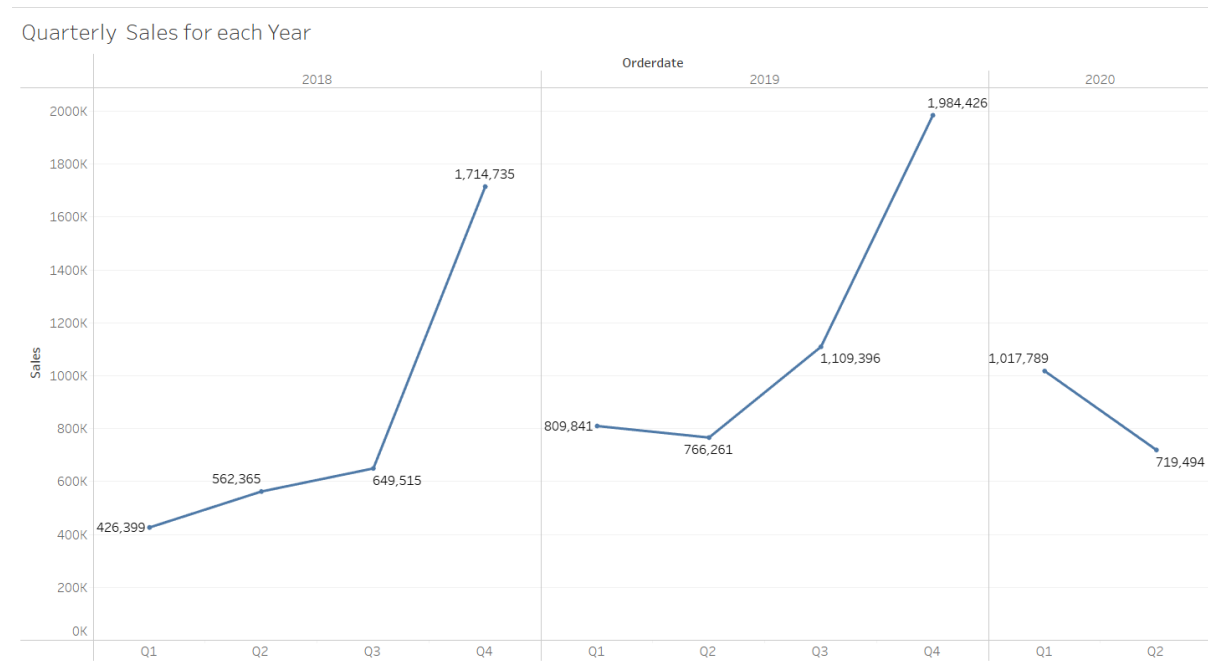
Quarterly Sales for each Year

2018

As we see that in the fourth quarter the sales was very high as compared to quarter1 to quarter 3 in

As in 4th quarter we see the value is 1,714,735

Compared to quarter 1 – 426,399

2019

As we see that in the fourth quarter the sales was very high as compared to quarter1 to quarter 3 in

As in 4th quarter we see the value is 1,984,426

Compared to quarter 1 – 809,841

2020

As we see that in the quarter 1st the sales was very high as compared to quarter2

As in 1st quarter we see the value is 1,017,789

Compared to quarter 2 – 719,494

Year – month

Monthly Sales for each Year
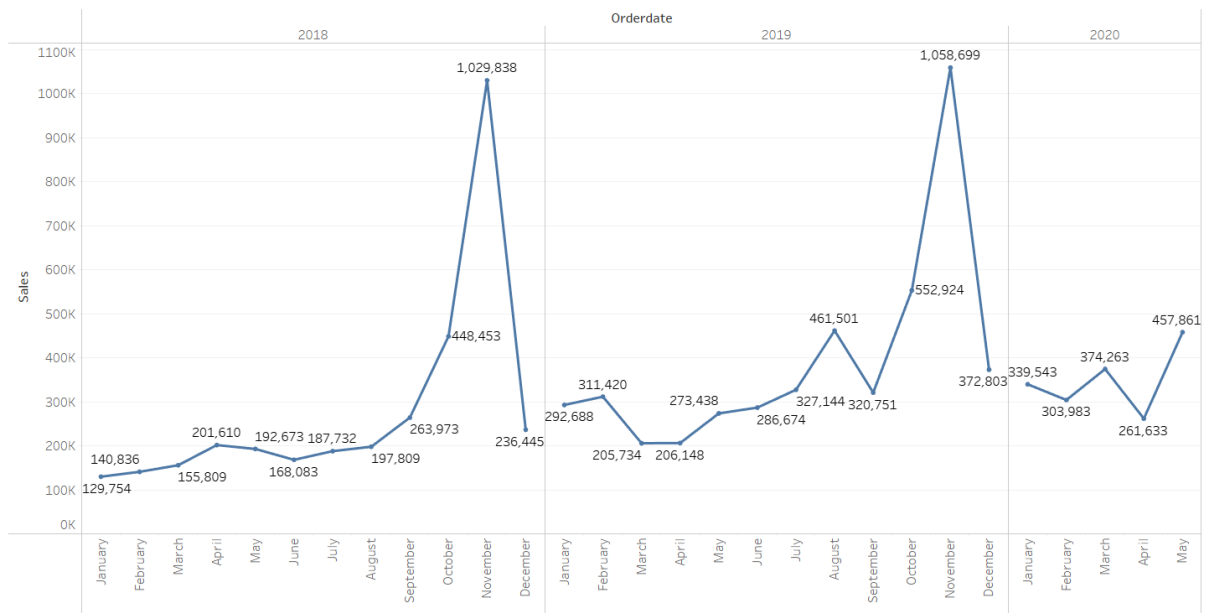
2018

As we see that in the November the sales was very high as compared to other months

The value is also high in November as compared to other months

Highest – 1,029,839

Low – 129,754

2019

As we see that in the November the sales was very high as compared to other months

The value is also high in November as compared to other months

Highest – 1,058,699

Low – 205,734

2020

As we see that in the may the sales was very high as compared to other months

The value is also high in May as compared to other months

Highest – 457,861

Low – 261,633

Year – week

Weekly Sales for each Year
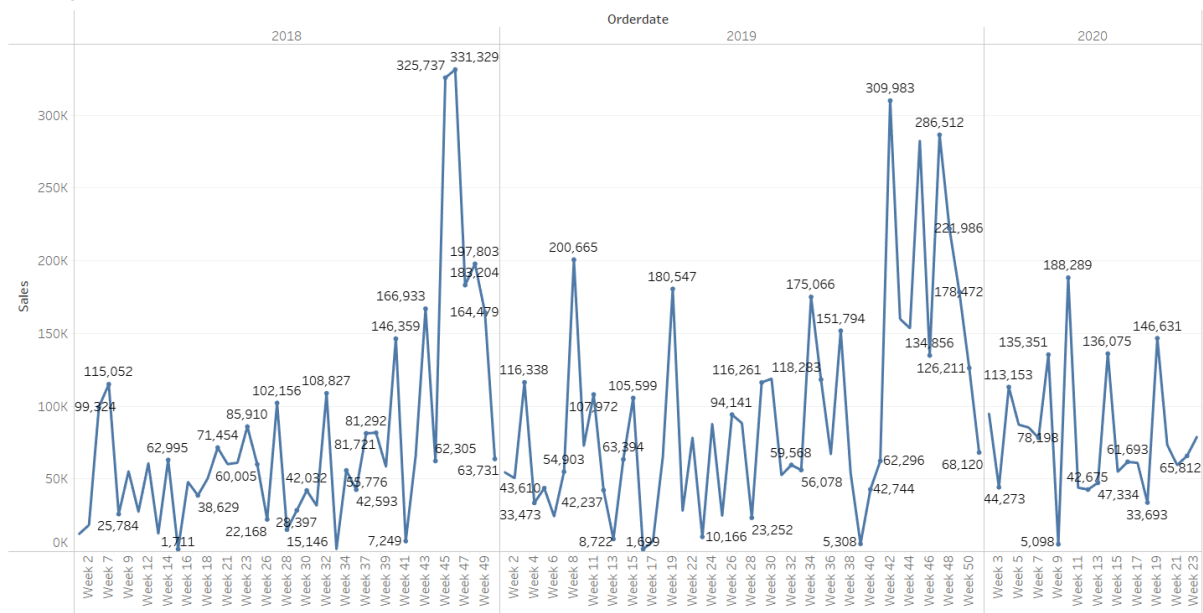
Question 3

Customer Segmentation using RFM analysis (4 segments) -> What is RFM? -> What all parameters used and assumptions made? ->When KNIME used, Workflow image to be put -> Output table head

Answer:

RFM

RFM is a method used for analyze customer value. It is commonly used for database marketing and direct marketing and has received particular attention in retail and professional services industries.

RFM stands for the three dimensions:

- **R**ecency – *How recently did the customer purchase?*
- **F**requency – *How often do they purchase?*
- **M**onetary Value – *How much do they spend?*

Customer purchases may be represented by a table with columns for the Customer name, date of purchase and purchase value. One approach to RFM is to assign a score for each dimension on a scale from 1 to 10. The maximum score represents the preferred behaviour and a formula could be used to calculate the three scores for each customer. For example, a service-based business could use these calculations:

- Recency = the maximum of "10 – the number of months that have passed since the customer last purchased" and 1
- Frequency = the maximum of "the number of purchases by the customer in the last 12 months (with a limit of 10)" and 1
- Monetary = the highest value of all purchases by the customer expressed as a multiple of some benchmark value

Alternatively, categories can be defined for each attribute. For instance, Recency might be broken into three categories: customers with purchases within the last 90 days; between 91 and 365 days; and longer than 365 days. Such categories may be derived from business rules or using data mining techniques to find meaningful breaks.

Segmentation of Customers

What comes to mind when you read these descriptions of customer segments?

Advocatess

Repeat buyers

Gift givers

Too good to be true

oHabitual returners

oFraud

Assumption made

This assumptions are mostly same for most companies/industries. **Customers who purchased recently are more likely to purchase again than the customers who purchased a long time ago**. Customers who have purchased more in the past are more likely to respond than the customers who have made fewer purchases.

When Knime used the workflow image

Excel Reader   Date&Time Difference   Column Filter   Math Formula   GroupBy   Auto-Binner   Cell Replacer   Cell Replacer   Cell Replacer   Excel Writer

Node 1   Node 2   Node 3   Node 4   Node 5   Node 6   Node 7   Node 9   Node 11   Node 13

Table Creator   Table Creator   Table Creator

Node 8   Node 10   Node 12
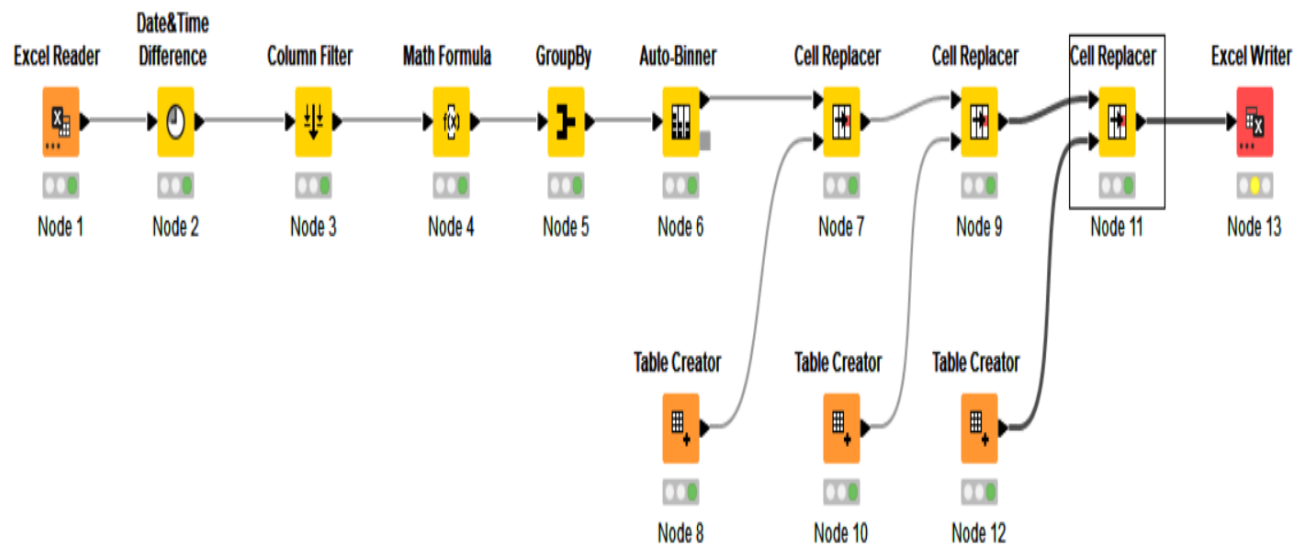
OUTPUT of Table:

Table "default" - Rows: 89   Spec - Columns: 19   Properties   Flow Variables

Row ID	S CUSTO...	I Count*...	D Mean(...	D Mean(P...	D Mean(S...	S First(ST...	S First(P...	D Mean(...	S First(CI...	S First(C...	S First(D...	L Min*(R...	D Sum(M...	S Count*...	S Min*(R...	S Sum(M...	S ...	S R...	S Moneta...
Row0	AV Stores, Co.	51	34.863	91.085	3,094.271	Shipped	Classic Cars	92.843	Manchester	UK	Medium	948	157,807.81	Bin 3	Bin 2	Bin 3		Medium	Medium
Row1	Alpha Cognac	20	34.35	101.16	3,524.422	Shipped	Classic Cars	97.15	Toulouse	France	Medium	816	70,488.44	Bin 1	Bin 1	Bin 1		Low	Very High
Row10	Auto-Moto Cl...	8	35.875	92.8	3,309.908	Shipped	Ships	87.375	Brickhaven	USA	Medium	932	26,479.26	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row11	Baane Mini I...	32	33.813	108.574	3,643.725	Shipped	Motorcycles	107.469	Stavern	Norway	Medium	960	116,599.19	Bin 2	Bin 2	Bin 2	M	Medium	High
Row12	Bavarian Coll...	14	28.643	84.289	2,499.566	Shipped	Planes	82.714	Munich	Germany	Medium	1011	34,993.92	Bin 1	Bin 3	Bin 1	H	High	Very High
Row13	Blauer See A...	22	36.864	108.031	3,871.436	Shipped	Classic Cars	105.818	Frankfurt	Germany	Medium	960	85,171.59	Bin 2	Bin 2	Bin 2	M	Medium	High
Row14	Boards & To...	3	34	89.807	3,043.117	Shipped	Classic Cars	92.333	Glendale	USA	Medium	865	9,129.35	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row15	CAF Imports	13	36	104.963	3,818.619	Shipped	Classic Cars	106.923	Madrid	Spain	Large	1191	49,642.05	Bin 1	Bin 3	Bin 1	H	High	Very High
Row16	Cambridge C...	11	32.455	101.329	3,287.602	Shipped	Classic Cars	97.364	Cambridge	USA	Medium	1141	36,163.62	Bin 1	Bin 3	Bin 1	H	High	Very High
Row17	Canadian Gif...	22	31.955	105.341	3,419.951	Shipped	Classic Cars	106.409	Vancouver	Canada	Large	974	75,238.92	Bin 2	Bin 2	Bin 2	M	Medium	High
Row18	Classic Gift I...	21	31.81	103.32	3,214.618	Shipped	Classic Cars	102.476	Philadelphia	USA	Medium	982	67,506.97	Bin 2	Bin 2	Bin 1	M	Medium	Very High
Row19	Classic Lege...	20	36	109.803	3,889.76	Shipped	Classic Cars	106.65	NYC	USA	Medium	944	77,795.2	Bin 2	Bin 2	Bin 2	M	Medium	High
Row2	Amica Model...	26	32.423	110.853	3,619.895	Shipped	Classic Cars	107.654	Torino	Italy	Large	1017	94,117.26	Bin 2	Bin 3	Bin 2	M	High	High
Row20	Clover Collec...	16	30.625	112.87	3,609.777	Shipped	Classic Cars	106.875	Dublin	Ireland	Medium	1010	57,756.43	Bin 1	Bin 3	Bin 1	H	High	Very High
Row21	Collectable M...	25	38.16	91.535	3,499.569	Shipped	Classic Cars	93.12	San Diego	USA	Medium	1212	87,489.23	Bin 2	Bin 3	Bin 2	H	High	High
Row22	Collectables ...	24	33.125	97.237	3,399.082	Shipped	Classic Cars	99.458	Brickhaven	USA	Medium	884	81,577.98	Bin 2	Bin 2	Bin 2	M	Medium	High
Row23	Corrida Auto...	32	36.344	105.175	3,769.227	Shipped	Classic Cars	102.625	Madrid	Spain	Large	964	120,615.28	Bin 2	Bin 2	Bin 3	M	Medium	Medium
Row24	Cruz & Sons ...	26	36.962	96.08	3,615.99	Shipped	Classic Cars	97.962	Makati City	Philippines	Medium	949	94,015.73	Bin 2	Bin 2	Bin 2	M	Medium	High
Row25	Daedalus De...	20	34.95	95.474	3,452.62	Shipped	Motorcycles	94.5	Lille	France	Small	1217	69,052.41	Bin 1	Bin 3	Bin 1	H	High	Very High
Row26	Danish Whol...	36	36.528	108.038	4,028.933	Shipped	Classic Cars	106.417	Kobenhavn	Denmark	Large	798	145,041.6	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row27	Diecast Class...	31	35.839	108.566	3,939.94	Shipped	Motorcycles	106.581	Allentown	USA	Medium	753	122,138.14	Bin 2	Bin 1	Bin 3	M	Low	Medium
Row28	Diecast Colle...	18	38.611	101.783	3,936.654	Shipped	Classic Cars	103.722	Boston	USA	Medium	1153	70,859.78	Bin 1	Bin 3	Bin 2	H	High	High
Row29	Double Deck...	12	29.75	99.108	3,001.587	Shipped	Classic Cars	93.25	London	UK	Medium	1247	36,019.04	Bin 1	Bin 3	Bin 1	H	High	Very High
Row3	Anna's Decor...	46	31.935	106.424	3,347.742	Shipped	Classic Cars	104.717	North Sydney	Australia	Small	835	153,996.13	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row30	Dragon Souv...	43	35.442	113.106	4,023.016	Shipped	Classic Cars	113.442	Singapore	Singapore	Large	842	172,989.68	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row31	Enaco Distrib...	23	38.348	88.783	3,409.211	Shipped	Classic Cars	87.087	Barcelona	Spain	Medium	941	78,411.86	Bin 2	Bin 2	Bin 2	M	Medium	High
Row32	Euro Shoppin...	259	36.012	97.383	3,522.371	Disputed	Motorcycles	97.015	Madrid	Spain	Large	752	912,294.11	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row33	FunGiftIdeas...	26	34.731	109.587	3,804.759	Shipped	Motorcycles	108	New Bedford	USA	Medium	841	98,923.73	Bin 2	Bin 2	Bin 2	M	Medium	High
Row34	Gift Depot Inc.	25	36.12	100.329	4,075.792	Shipped	Motorcycles	110.92	Bridgewater	USA	Medium	778	101,894.79	Bin 2	Bin 1	Bin 2	M	Low	High
Row35	Gift Ideas Co...	19	35.053	87.6	3,015.496	Shipped	Planes	86.526	Glendale	USA	Small	931	57,294.42	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row36	Gifts4AllAges...	26	35.885	91.564	3,200.38	Shipped	Classic Cars	90.731	Boston	USA	Medium	777	83,209.88	Bin 2	Bin 1	Bin 2	M	Low	High
Row37	Handji Gifts&...	36	34.333	95.593	3,208.298	Shipped	Classic Cars	97.222	Singapore	Singapore	Large	790	115,498.73	Bin 3	Bin 1	Bin 2	L	Low	Medium
Row38	Heintze Colle...	27	32.667	112.268	3,725.761	Shipped	Classic Cars	110.926	Aaarhus	Denmark	Large	974	100,595.55	Bin 2	Bin 2	Bin 2	M	Medium	High
Row39	Herku Gifts	29	33.552	113.559	3,849.665	Shipped	Motorcycles	109.759	Bergen	Norway	Medium	1023	111,640.28	Bin 2	Bin 3	Bin 2	M	High	High
Row4	Atelier graph...	7	38.571	92.239	3,454.28	Shipped	Classic Cars	95.571	Nantes	France	Medium	940	24,179.96	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row40	Iberia Gift Im...	15	39.267	93.283	3,648.241	Shipped	Trucks and ...	93.133	Sevilla	Spain	Medium	990	54,723.62	Bin 1	Bin 3	Bin 1	H	High	Very High
Row41	L'ordine Sou...	39	32.821	111.147	3,656.444	Shipped	Classic Cars	107.795	Reggio Emilia	Italy	Large	773	142,601.33	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row42	La Corne D'a...	23	36.348	113.65	4,226.247	Shipped	Classic Cars	112.826	Paris	France	Medium	945	97,203.68	Bin 2	Bin 2	Bin 2	M	Medium	High
Row43	La Rochelle ...	53	34.566	97.046	3,398.583	Shipped	Motorcycles	96.151	Nantes	France	Medium	752	180,124.9	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row44	Land of Toys...	49	33.286	104.121	3,348.356	Shipped	Motorcycles	102.98	NYC	USA	Small	950	164,069.44	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row45	Lyon Souven...	20	34.2	113.002	3,928.517	Shipped	Motorcycles	110.55	Paris	France	Medium	827	78,570.34	Bin 1	Bin 1	Bin 2	H	Low	High
Row46	Marseille Mini...	25	32.16	92.397	2,997.446	Shipped	Classic Cars	99.76	Marseille	France	Large	898	74,936.14	Bin 2	Bin 2	Bin 2	M	Medium	High
Row47	Marta's Repli...	27	36.148	107.072	3,817.792	Shipped	Motorcycles	104.259	Cambridge	USA	Medium	983	103,080.38	Bin 2	Bin 3	Bin 2	M	High	High
Row48	Microscale Inc.	10	38.1	88.494	3,314.493	Shipped	Motorcycles	85.3	NYC	USA	Medium	962	33,144.93	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row49	Mini Auto We...	15	35.467	98.083	3,484.26	Resolved	Classic Cars	103	Graz	Austria	Medium	834	52,263.9	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row5	Australian C...	23	30.652	90.042	2,808.324	Shipped	Vintage Cars	88.13	Glen Waverly	Australia	Medium	774	64,591.46	Bin 2	Bin 1	Bin 1	M	Low	Very High
Row50	Mini Caravy	19	41	99.27	4,233.604	Shipped	Classic Cars	101.105	Strasbourg	France	Large	799	80,438.48	Bin 1	Bin 1	Bin 2	H	Low	High
Row51	Mini Classics	26	35.731	95.03	3,290.615	Shipped	Motorcycles	94.808	White Plains	USA	Medium	981	85,555.99	Bin 2	Bin 2	Bin 2	M	Medium	High
Row52	Mini Creation...	35	32.571	95.129	3,112.889	Shipped	Classic Cars	98.057	New Bedford	USA	Medium	897	108,951.13	Bin 3	Bin 1	Bin 2	L	Medium	High
Row53	Mini Gifts Dis...	180	35.367	102.696	3,638.1	Shipped	Classic Cars	102.506	San Rafael	USA	Large	754	654,858.06	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row54	Motor Mint Di...	23	31.739	113.407	3,638.355	Shipped	Motorcycles	112	Philadelphia	USA	Small	948	83,682.16	Bin 2	Bin 2	Bin 2	M	Medium	High
Row55	Muscle Machi...	48	36.979	111.151	4,119.52	Shipped	Classic Cars	108.396	NYC	USA	Large	934	197,736.94	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row56	Norway Gifts...	24	32.792	97.954	3,301.01	Shipped	Classic Cars	97.25	Oslo	Norway	Medium	1036	79,224.23	Bin 2	Bin 3	Bin 2	M	High	High
Row57	Online Dieca...	34	36.706	108.302	3,873.097	Shipped	Classic Cars	105	Nashua	USA	Medium	961	131,685.3	Bin 3	Bin 3	Bin 3	L	Medium	Medium
Row58	Online Mini C...	15	38.133	94.681	3,813.197	Shipped	Classic Cars	100.533	London	USA	Large	1016	57,197.96	Bin 1	Bin 3	Bin 1	H	High	Very High
Row59	Osaka Souve...	20	34.6	99.914	3,380.253	Shipped	Motorcycles	101.65	Osaka	Japan	Medium	1166	67,605.07	Bin 1	Bin 2	Bin 1	H	High	Very High
Row6	Australian C...	55	35.018	104.59	3,654.462	Shipped	Classic Cars	103.527	Melbourne	Australia	Medium	936	200,995.41	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row60	Oulu Toy Su...	32	34.687	95.119	3,261.574	Shipped	Classic Cars	95.531	Oulu	Finland	Medium	873	104,370.38	Bin 2	Bin 2	Bin 2	M	Medium	High
Row61	Petit Auto	25	31.84	93.494	2,998.901	Shipped	Classic Cars	96.56	Bruxelles	Belgium	Medium	753	74,972.52	Bin 2	Bin 1	Bin 2	M	Low	High
Row62	Quebec Hom...	22	32.591	104.515	3,372.945	Shipped	Classic Cars	107.182	Montreal	Canada	Medium	782	74,204.79	Bin 2	Bin 1	Bin 2	M	Low	High
Row63	Reims Collect...	41	34.951	94.343	3,293.73	Shipped	Motorcycles	96.585	Reims	France	Small	814	135,042.94	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row64	Rovelli Gifts	48	34.375	85.677	2,874.077	Shipped	Vintage Cars	85.75	Bergamo	Italy	Medium	953	137,955.72	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row65	Royal Canadi...	26	33.577	86.449	2,870.571	Shipped	Classic Cars	86.231	Tsawassen	Canada	Small	1037	74,634.85	Bin 2	Bin 3	Bin 2	M	High	High
Row66	Royale Belge	8	34.75	115.195	4,180.012	Shipped	Planes	115.125	Charleroi	Belgium	Medium	894	33,440.1	Bin 1	Bin 1	Bin 1	H	Medium	Very High
Row67	Salzburg Coll...	40	36.05	101.398	3,744.966	Shipped	Motorcycles	102.925	Salzburg	Austria	Large	766	149,798.63	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row68	Saveley & H...	41	34.829	100.548	3,484.738	Shipped	Classic Cars	102.024	Lyon	France	Large	1208	142,874.25	Bin 3	Bin 3	Bin 3	L	High	Medium
Row69	Scandinavian...	38	35.763	97.597	3,533.14	Shipped	Classic Cars	99.184	Boras	Sweden	Large	841	134,259.33	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row7	Australian Gi...	15	36.333	110.554	3,964.608	Shipped	Classic Cars	111.533	South Brisbane	Australia	Large	871	59,469.12	Bin 1	Bin 2	Bin 1	H	High	Very High
Row70	Signal Collect...	15	34.267	95.396	3,347.901	Shipped	Trucks and ...	90.933	Brisbane	USA	Medium	1228	50,218.51	Bin 1	Bin 3	Bin 1	H	High	Very High
Row71	Signal Gift St...	29	32.034	91.429	2,853.486	Shipped	Classic Cars	96.724	Las Vegas	USA	Medium	936	82,751.08	Bin 2	Bin 2	Bin 2	M	Medium	High
Row72	Souveniers A...	46	34.804	95.189	3,295.021	Shipped	Motorcycles	93.087	Chatswood	Australia	Small	754	151,570.98	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row73	Stylish Desk ...	26	36.038	96.993	3,415.558	Shipped	Classic Cars	96.038	London	UK	Medium	932	88,804.5	Bin 2	Bin 2	Bin 2	M	Medium	High
Row74	Suominen So...	30	34.367	110.405	3,798.705	Shipped	Classic Cars	109.6	Espoo	Finland	Small	898	113,961.15	Bin 2	Bin 2	Bin 2	M	Medium	High
Row75	Super Scale I...	17	37.412	128.452	4,674.828	Shipped	Classic Cars	123.471	New Haven	USA	Medium	1145	79,472.07	Bin 1	Bin 3	Bin 2	H	High	High
Row76	Technics Sto...	34	34.676	104.914	3,552.443	Shipped	Motorcycles	102.294	Burlingame	USA	Medium	899	120,783.07	Bin 3	Bin 2	Bin 3	L	Low	Medium
Row77	Tekni Collect...	21	43.143	93.571	3,963.247	Shipped	Motorcycles	93.286	Newark	USA	Medium	810	83,228.19	Bin 2	Bin 1	Bin 2	M	Low	High
Row78	The Sharp Gi...	40	41.4	93.376	4,000.257	Shipped	Classic Cars	92.775	San Jose	USA	Large	791	160,010.27	Bin 3	Bin 1	Bin 3	L	Low	Medium
Row79	Tokyo Collec...	32	35.937	101.183	3,767.586	Shipped	Classic Cars	99.281	Minato-ku	Japan	Large	791	120,562.74	Bin 3	Bin 1	Bin 2	M	Low	Medium
Row8	Auto Assoc...	18	35.389	99.488	3,601.907	Shipped	Classic Cars	100.389	Versailles	France	Large	985	64,834.32	Bin 1	Bin 3	Bin 1	H	High	Very High
Row80	Toms Speziali...	26	36	109.363	3,857.945	Shipped	Classic Cars	107.5	Koln	Germany	Medium	980	100,306.58	Bin 2	Bin 2	Bin 2	M	Medium	High
Row81	Toys of Finla...	30	35.033	105.752	3,708.346	Shipped	Motorcycles	100.5	Helsinki	Finland	Small	864	111,250.38	Bin 3	Bin 2	Bin 2	M	Medium	Medium
Row82	Toys4Grown...	30	35.333	97.225	3,485.399	Shipped	Motorcycles	97.267	Pasadena	USA	Medium	892	104,561.96	Bin 2	Bin 2	Bin 2	M	Medium	High
Row83	UK Collectabl...	29	36.069	100.538	4,069.251	Shipped	Motorcycles	110.276	Liverpool	UK	Small	805	118,008.27	Bin 2	Bin 1	Bin 2	M	Low	High
Row84	Vida Sport, Ltd	31	34.774	112.075	3,797.212	Shipped	Classic Cars	115.581	Gensve	Switzerland	Medium	1027	117,713.56	Bin 2	Bin 3	Bin 2	M	High	High
Row85	Vitachrome Inc.	25	31.48	106.179	3,521.65	Shipped	Classic Cars	102.08	NYC	USA	Small	960	88,041.26	Bin 2	Bin 2	Bin 2	M	Medium	High
Row86	Volvo Model ...	19	34.053	119.289	3,987.099	Shipped	Classic Cars	116	Lule	Sweden	Large	946	75,754.88	Bin 1	Bin 3	Bin 1	H	Medium	High
Row87	West Coast ...	13	39.308	88.308	3,544.972	Shipped	Classic Cars	93.231	Burbank	USA	Medium	1240	46,084.64	Bin 1	Bin 3	Bin 1	H	High	Very High
Row88	giftsbymail.c...	26	34.423	88.979	3,009.263	Shipped	Classic Cars	89.5	Cowes	UK	Medium	964	78,240.84	Bin 1	Bin 2	Bin 1	H	Medium	High
Row9	Auto Canal P...	27	37.074	94.255	3,450.765	Shipped	Motorcycles	94.852	Paris	France	Medium	806	93,170.66	Bin 2	Bin 1	Bin 2	M	Low	High

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Question 4

Inferences from RFM Analysis and identified segments -> Who are your best customers? (give at least 5) -> Which customers are on the verge of churning? (give at least 5) -> Who are your lost customers? (give at least 5) -> Who are your loyal customers? (give at least 5)

Answer

Best 5 customer

Table "default" - Rows: 89   Spec - Columns: 19   Properties   Flow Variables

Row ID	S CUSTO...	I Count*...	D Mean(...	D Mean(P...	D Mean(S...	S First(ST...	S First(P...	D Mean(...	S First(CI...	S First(C...	S First(D...	L Min*(R...	D Sum(M...	S Count*...	S Min*(R...	S Sum(M...	S ...	S R...	S Moneta...
Row0	AV Stores, Co.	51	34.863	91.085	3,094.271	Shipped	Classic Cars	92.843	Manchester	UK	Medium	948	157,807.81	Bin 3	Bin 2	Bin 3	L	Medium	Medium
Row1	Alpha Cognac	20	34.35	101.16	3,524.422	Shipped	Classic Cars	97.15	Toulouse	France	Medium	816	70,488.44	Bin 1	Bin 1	Bin 1	H	Low	Very High
Row10	Auto-Moto Cl...	8	35.875	92.8	3,309.908	Shipped	Ships	87.375	Brickhaven	USA	Medium	932	26,479.26	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row11	Baane Mini I...	32	33.813	108.574	3,643.725	Shipped	Motorcycles	107.469	Stavern	Norway	Medium	960	116,599.19	Bin 2	Bin 2	Bin 2	M	Medium	High
Row12	Bavarian Coll...	14	28.643	84.289	2,499.566	Shipped	Planes	82.714	Munich	Germany	Medium	1011	34,993.92	Bin 1	Bin 3	Bin 1	H	High	Very High
Row13	Blauer See A...	22	36.864	108.031	3,871.436	Shipped	Classic Cars	105.818	Frankfurt	Germany	Medium	960	85,171.59	Bin 2	Bin 2	Bin 2	M	Medium	High
Row14	Boards & To...	3	34	89.807	3,043.117	Shipped	Classic Cars	92.333	Glendale	USA	Medium	865	9,129.35	Bin 1	Bin 2	Bin 1	H	Medium	Very High
Row15	CAF Imports	13	36	104.963	3,818.619	Shipped	Classic Cars	106.923	Madrid	Spain	Large	1191	49,642.05	Bin 1	Bin 3	Bin 1	H	High	Very High

Lost 5 customer

Row83	UK Collectabl...	29	36.069	108.536	4,069.251	Shipped	Motorcycles	110.276	Liverpool	UK	Small	805	118,008.27	Bin 2	Bin 1	Bin 2	M	Low	High
Row84	Vida Sport, Ltd	31	34.774	112.075	3,797.212	Shipped	Classic Cars	115.581	Gensve	Switzerland	Medium	1027	117,713.56	Bin 2	Bin 3	Bin 2	M	High	High
Row85	Vitachrome Inc.	25	31.48	106.179	3,521.65	Shipped	Motorcycles	102.08	NYC	USA	Small	960	88,041.26	Bin 2	Bin 2	Bin 2	M	Medium	High
Row86	Volvo Model ...	19	34.053	119.289	3,987.099	Shipped	Classic Cars	116	Lule	Sweden	Large	946	75,754.88	Bin 1	Bin 3	Bin 1	H	Medium	High
Row87	West Coast ...	13	39.308	88.308	3,544.972	Shipped	Classic Cars	93.231	Burbank	USA	Medium	1240	46,084.64	Bin 1	Bin 3	Bin 1	H	High	Very High
Row88	giftsbymail.c...	26	34.423	88.979	3,009.263	Shipped	Classic Cars	89.5	Cowes	UK	Medium	964	78,240.84	Bin 2	Bin 2	Bin 2	M	Medium	High
Row9	Auto Canal P...	27	37.074	94.255	3,450.765	Shipped	Motorcycles	94.852	Paris	France	Medium	806	93,170.66	Bin 2	Bin 1	Bin 2	M	Low	High

Customer on the verge of churning

Row ID	S CUSTO...	I Count*...	D Mean(...	D Mean(P...	D Mean(S...	S First(ST...	S First(P...	D Mean(...	S First(CI...	S First(C...	S First(D...	L Min*(R...	D Sum(M...	S Count*...	S Min*(R...	S Sum(M...	S ...	S + ...	S Mo...
Row2	Amica Model...	26	32.423	110.853	3,619.895	Shipped	Classic Cars	107.654	Torino	Italy	Large	1017	94,117.26	Bin 2	Bin 3	Bin 2	M	High	High
Row21	Collectable M...	25	38.16	91.535	3,499.569	Shipped	Classic Cars	93.12	San Diego	USA	Medium	1212	87,489.23	Bin 2	Bin 3	Bin 2	M	High	High
Row28	Diecast Colle...	18	38.611	101.783	3,936.654	Shipped	Classic Cars	103.722	Boston	USA	Medium	1153	70,859.78	Bin 1	Bin 3	Bin 2	H	High	High
Row39	Herkku Gifts	29	33.552	113.559	3,849.665	Shipped	Motorcycles	109.759	Bergen	Norway	Medium	1023	111,640.28	Bin 2	Bin 3	Bin 2	M	High	High
Row47	Marta's Repli...	27	36.148	107.072	3,817.792	Shipped	Motorcycles	104.259	Cambridge	USA	Medium	983	103,080.38	Bin 2	Bin 3	Bin 2	M	High	High
Row56	Norway Gifts...	24	32.792	97.954	3,301.01	Shipped	Classic Cars	97.25	Oslo	Norway	Medium	1036	79,224.23	Bin 2	Bin 3	Bin 2	M	High	High
Row65	Royal Canadi...	26	33.577	86.449	2,870.571	Shipped	Classic Cars	86.231	Tsawassen	Canada	Small	1037	74,634.85	Bin 2	Bin 3	Bin 2	M	High	High
Row75	Super Scale I...	17	37.412	128.452	4,674.828	Shipped	Classic Cars	123.471	New Haven	USA	Medium	1145	79,472.07	Bin 1	Bin 3	Bin 2	H	High	High
Row84	Vida Sport, Ltd	31	34.774	112.075	3,797.212	Shipped	Classic Cars	115.581	Gensve	Switzerland	Medium	1027	117,713.56	Bin 2	Bin 3	Bin 2	M	High	High
Row9	Auto Canal P...	27	37.074	94.255	3,450.765	Shipped	Motorcycles	94.852	Paris	France	Medium	806	93,170.66	Bin 2	Bin 1	Bin 2	M	Low	High

Loyal customers

Row ID	S CUSTO...	I Count*...	D Mean(...	D Mean(P...	D Mean(S...	S First(ST...	S First(P...	D Mean(...	S First(CI...	S First(C...	S First(D...	L Min*(R...	D Sum(M...	S Count*...	S Min*(R...	S Sum(M...	S +	S ▲ ..	S Moneta...
Row8	Auto Assoc. ...	18	35.389	99.488	3,601.907	Shipped	Classic Cars	100.389	Versailles	France	Large	985	64,834.32	Bin 1	Bin 3	Bin 1		High	Very High
Row12	Bavarian Coll...	14	28.643	84.289	2,499.566	Shipped	Planes	82.714	Munich	Germany	Medium	1011	34,993.92	Bin 1	Bin 3	Bin 1		High	Very High
Row15	CAF Imports	13	36	104.963	3,818.619	Shipped	Classic Cars	106.923	Madrid	Spain	Large	1191	49,642.05	Bin 1	Bin 3	Bin 1		High	Very High
Row16	Cambridge C...	11	32.455	101.329	3,287.602	Shipped	Classic Cars	97.364	Cambridge	USA	Medium	1141	36,163.62	Bin 1	Bin 3	Bin 1		High	Very High
Row20	Clover Collec...	16	30.625	112.87	3,609.777	Shipped	Classic Cars	106.875	Dublin	Ireland	Large	1010	57,756.43	Bin 1	Bin 3	Bin 1		High	Very High
Row25	Daedalus De...	20	34.95	95.474	3,452.62	Shipped	Motorcycles	94.5	Lille	France	Small	1217	69,052.41	Bin 1	Bin 3	Bin 1		High	Very High

END