

# RFM Analysis Business Report

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# Problem Statement

An automobile parts manufacturing company has collected data on 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 data science skills to find the underlying buying patterns of the customers, provide the company with suitable insights about their customers, and recommend customized marketing strategies for different segments of customers.

## **Dataset:**

Auto Sales Data: [Sales\\_Data.xlsx](#)

# Knowing the dataset

- The Sales\_Data dataset has 2747 rows and 20 columns.
- First 5 rows of the dataset:

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

*Table 1: First 5 rows of dataset*

# Knowing the dataset

- First 5 rows of the dataset(contd):

PRODUCTCODE	CUSTOMERNAME	PHONE	ADDRESSLINE1	CITY	POSTALCODE	COUNTRY	CONTACTLASTNAME	CONTACTFIRSTNAME	DEALSIZE
S10_1678	Land of Toys Inc.	2125557818	897 Long Airport Avenue	NYC	10022	USA	Yu	Kwai	Small
S10_1678	Reims Collectables	26.47.1555	59 rue de l'Abbaye	Reims	51100	France	Henriot	Paul	Small
S10_1678	Lyon Souvenirs	+33 1 46 62 7555	27 rue du Colonel Pierre Avia	Paris	75508	France	Da Cunha	Daniel	Medium
S10_1678	Toys4GrownUps.com	6265557265	78934 Hillside Dr.	Pasadena	90003	USA	Young	Julie	Medium
S10_1678	Technics Stores Inc.	6505556809	9408 Furth Circle	Burlingame	94217	USA	Hirano	Juri	Medium

*Table 2: First 5 rows of dataset (contd)*

# Knowing the dataset

- Last 5 rows of the dataset:

	ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	DAYS_SINCE_LASTORDER	STATUS	PRODUCTLINE	M
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	

*Table 3: Last 5 rows of dataset*



# Knowing the dataset

- Last 5 rows of the dataset(contd):

IP	PRODUCTCODE	CUSTOMERNAME	PHONE	ADDRESSLINE1	CITY	POSTALCODE	COUNTRY	CONTACTLASTNAME	CONTACTFIRSTNAME	DEALSIZE
54	S72_3212	Euro Shopping Channel	(91) 555 94 44	C/ Moralarzal, 86	Madrid	28034	Spain	Freyre	Diego	Small
54	S72_3212	Oulu Toy Supplies, Inc.	981-443655	Torikatu 38	Oulu	90110	Finland	Koskitalo	Pirkko	Medium
54	S72_3212	Euro Shopping Channel	(91) 555 94 44	C/ Moralarzal, 86	Madrid	28034	Spain	Freyre	Diego	Medium
54	S72_3212	Alpha Cognac	61.77.6555	1 rue Alsace-Lorraine	Toulouse	31000	France	Roulet	Annette	Small
54	S72_3212	Gifts4AllAges.com	6175559555	8616 Spinnaker Dr.	Boston	51003	USA	Yoshido	Juri	Medium

*Table 4: Last 5 rows of dataset(contd)*

# Knowing the dataset

- Brief description of some important features in the dataset:
  - **PRICEEACH**: Indicates the price of each item in the order.
  - **ORDERLINENUMBER**: Line number of the item within the order.
  - **SALES**: Amount of Sales done for the order.
  - **DAYS\_SINCE\_LASTORDER**: Number of days since the last order for each customer.
  - **MSRP**: Manufacturer suggested retail price for the item in the order.
  - **STATUS**: Represents Status of the order "Shipped," "In Process," "Cancelled," "Disputed," "On Hold," or "Resolved".
  - **CUSTOMERNAME**: Name of the customer/business who has placed the order.
  - **DEALSIZE**: Indicates the size of the deal or order - "Small", "Medium", "Large".

# Knowing the dataset

- Basic information of the dataset:

```
<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
```

*Figure 1: Basic information of dataset*

- The dataset has features with 5 integer data types, 2 float data types, 1 datetime data type and 12 object data types.

# Knowing the dataset

- As seen in the above table, there are no null values in the dataset.
- There are no duplicate rows in the dataset.
- Basic summary of numeric type data features:

	count	mean	min	25%	50%	75%	max	std
ORDERNUMBER	2747.0	10259.761558	10100.0	10181.0	10264.0	10334.5	10425.0	91.877521
QUANTITYORDERED	2747.0	35.103021	6.0	27.0	35.0	43.0	97.0	9.762135
PRICEEACH	2747.0	101.098951	26.88	68.745	95.55	127.1	252.87	42.042548
ORDERLINENUMBER	2747.0	6.491081	1.0	3.0	6.0	9.0	18.0	4.230544
SALES	2747.0	3553.047583	482.13	2204.35	3184.8	4503.095	14082.8	1838.953901
ORDERDATE	2747	2019-05-13 21:56:17.211503360	2018-01-06 00:00:00	2018-11-08 00:00:00	2019-06-24 00:00:00	2019-11-17 00:00:00	2020-05-31 00:00:00	NaN
DAYS_SINCE_LASTORDER	2747.0	1757.085912	42.0	1077.0	1761.0	2436.5	3562.0	819.280576
MSRP	2747.0	100.691664	33.0	68.0	99.0	124.0	214.0	40.114802

*Table 5: Summary of numeric features of dataset*

# Knowing the dataset

- Basic summary of categorical data features:

	count	unique	top	freq
<b>STATUS</b>	2747	6	Shipped	2541
<b>PRODUCTLINE</b>	2747	7	Classic Cars	949
<b>PRODUCTCODE</b>	2747	109	S18_3232	51
<b>CUSTOMERNAME</b>	2747	89	Euro Shopping Channel	259
<b>PHONE</b>	2747	88	(91) 555 94 44	259
<b>ADDRESSLINE1</b>	2747	89	C/ Moralarzal, 86	259
<b>CITY</b>	2747	71	Madrid	304
<b>POSTALCODE</b>	2747	73	28034	259
<b>COUNTRY</b>	2747	19	USA	928
<b>CONTACTLASTNAME</b>	2747	76	Freyre	259
<b>CONTACTFIRSTNAME</b>	2747	72	Diego	259
<b>DEALSIZE</b>	2747	3	Medium	1349

*Table 6: Summary of categorical features of dataset*

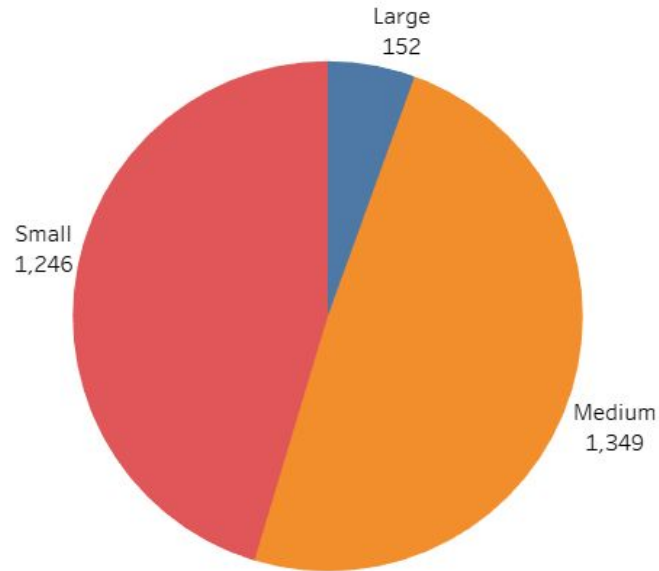
# Insights and inferences

- There are 299 unique orders recorded by the company in the dataset.
- Average quantity ordered is 35.
- Price of each item in the order ranges from 26\$ to 252\$.
- Average sales per each order is 3553\$. 97% of the sales range from 1714\$ to 5392\$
- Half of the customers have not ordered since 1761 days. There exist customers who have not reached since 2436 days as well. This makes sense as the company deals with selling vehicles which are not frequent purchases.
- Most of the products sold are of 'Classic cars' type.
- 'Euro Shipping Channel' is the company that has placed highest number of orders with the company.
- Most of the orders (928) have been received from USA.
- Out of 2747, 1349 deals were of size 'Medium'.

# Exploratory Data Analysis - Univariate, Bivariate and Multivariate

# Distribution of Deal Size

- Most of the deals are of Medium and Small size.



*Figure 2: Deal Size distribution - Pie chart*



# Percentage of orders delivered with various Status values

- 92.5% of the Orders were shipped. 2% of the orders were cancelled. 1.6% of the orders are on hold.

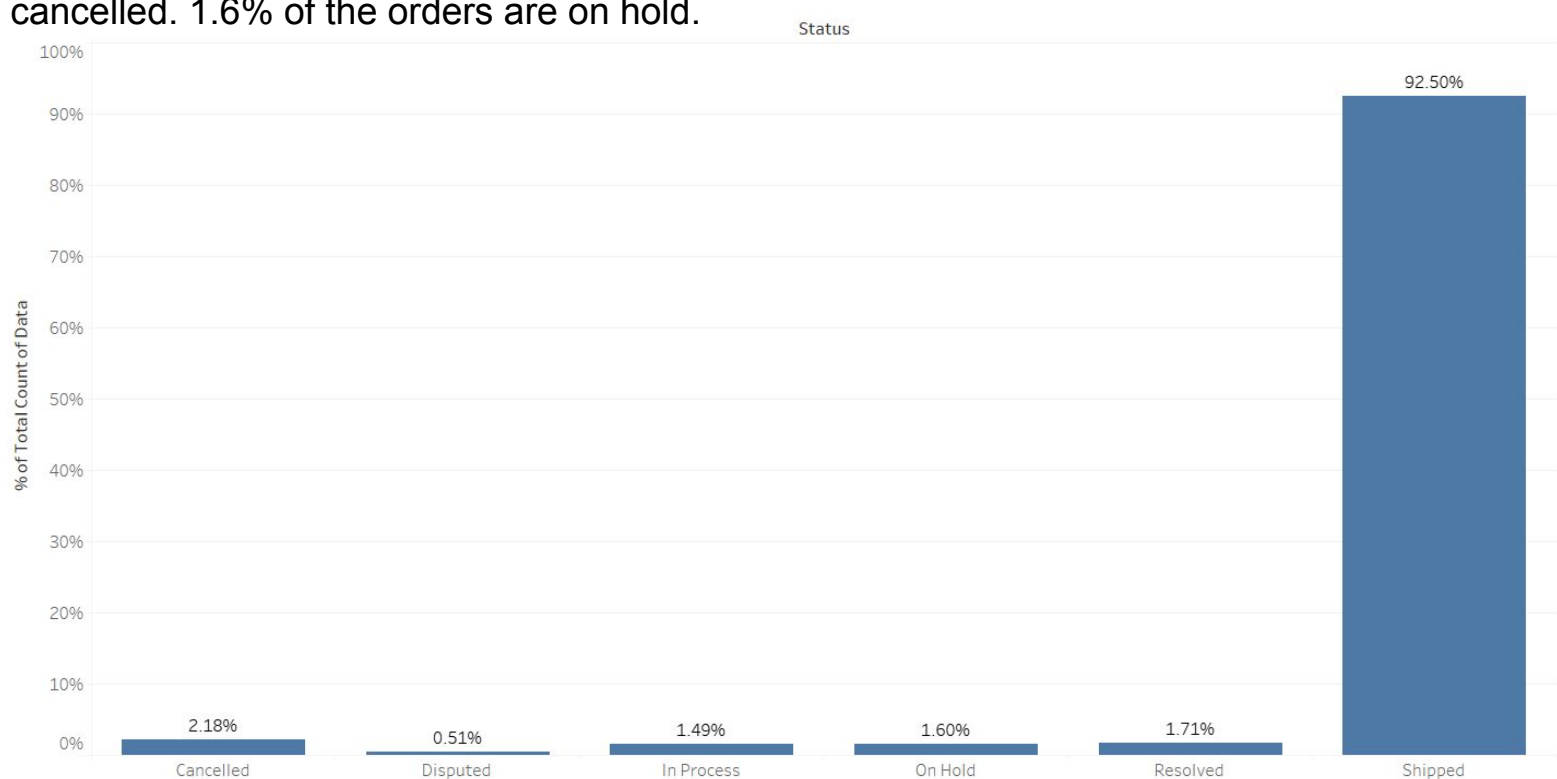
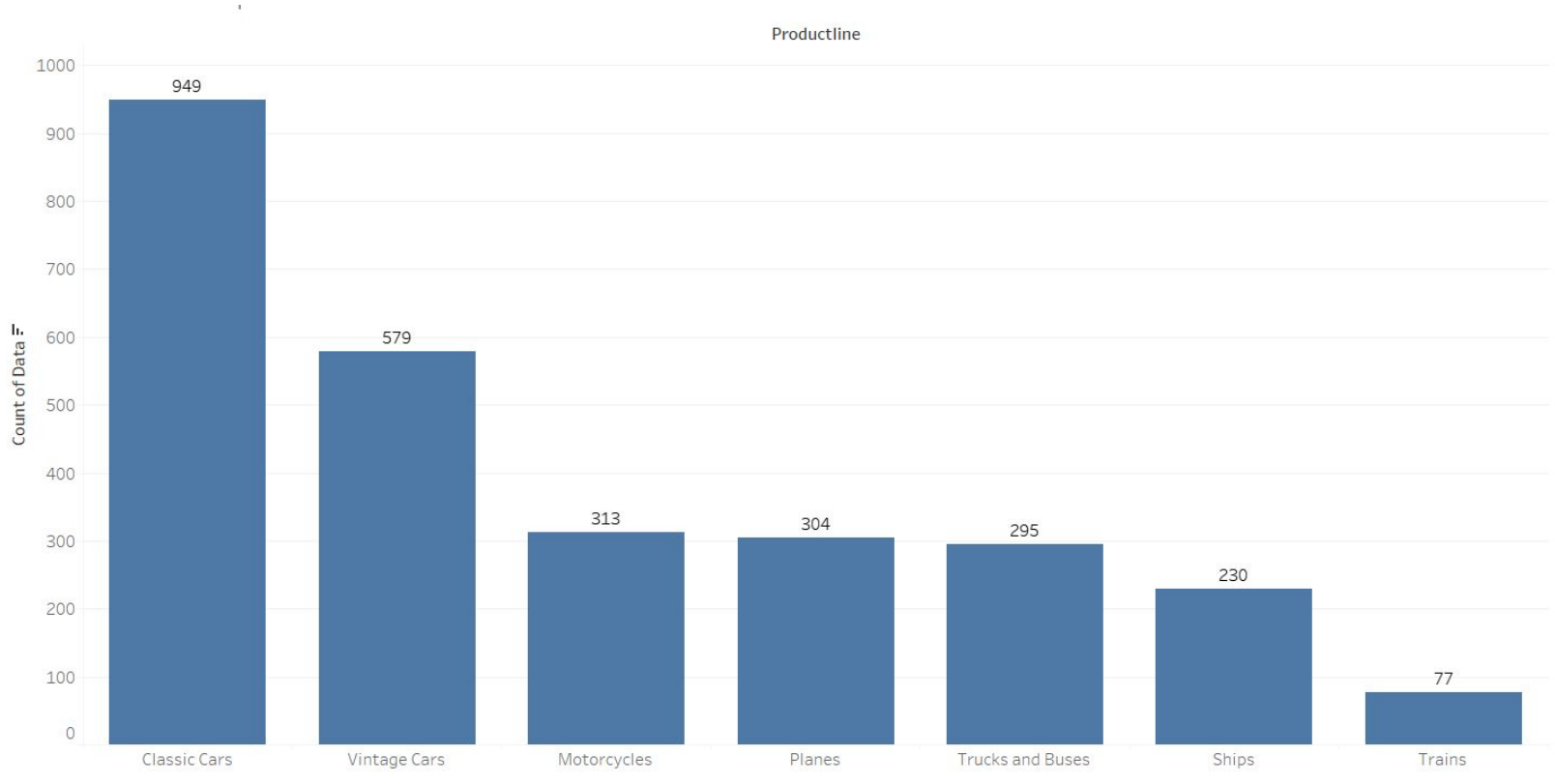


Figure 3: Delivery status - Bar chart

# Count of products belonging to product lines in all orders placed

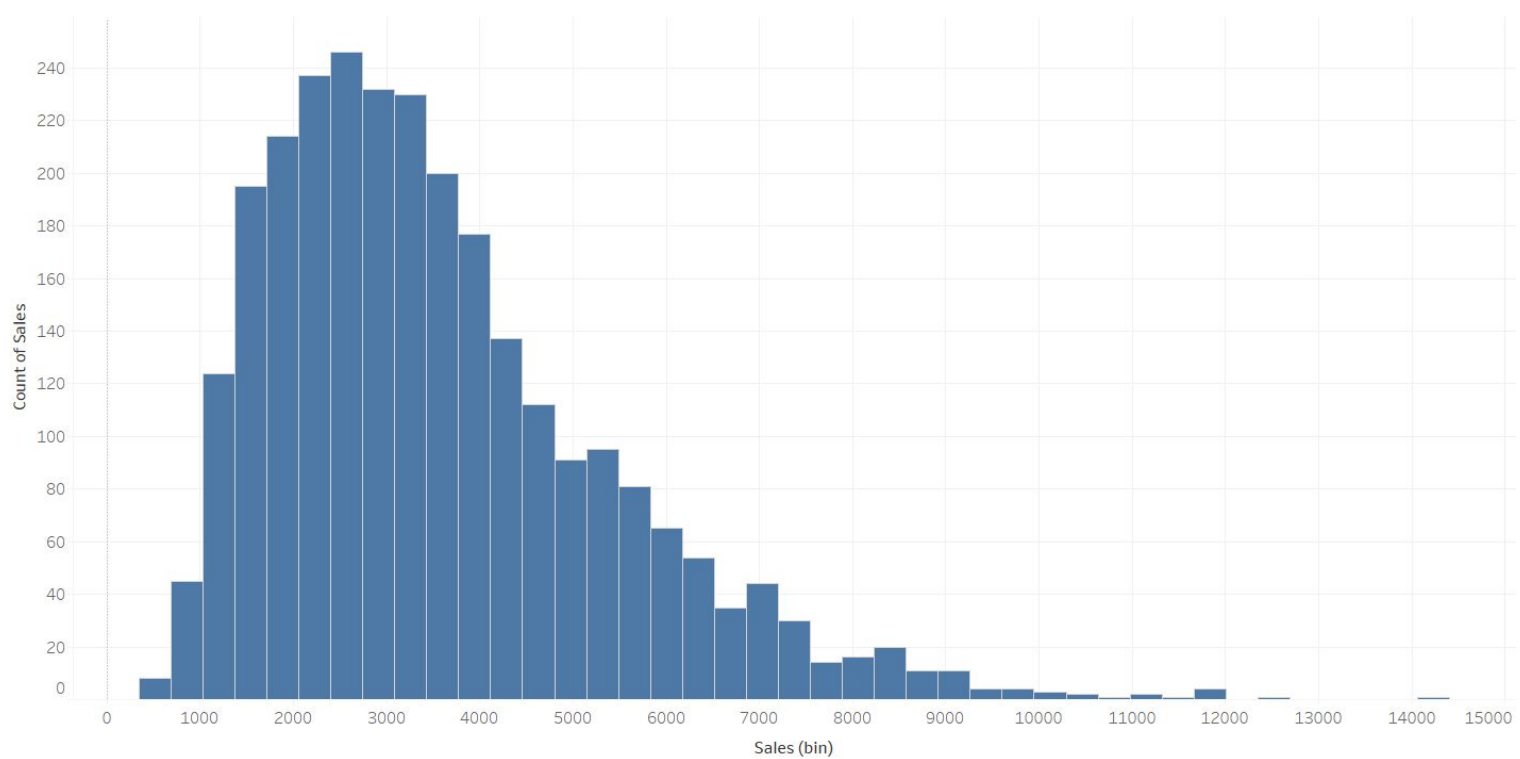
- Around 1800 of the orders were placed for 'Classic cars', 'Vintage cars', 'Motorcycles'.



*Figure 4: Product line count distribution - Bar chart*

# Histogram of Sales

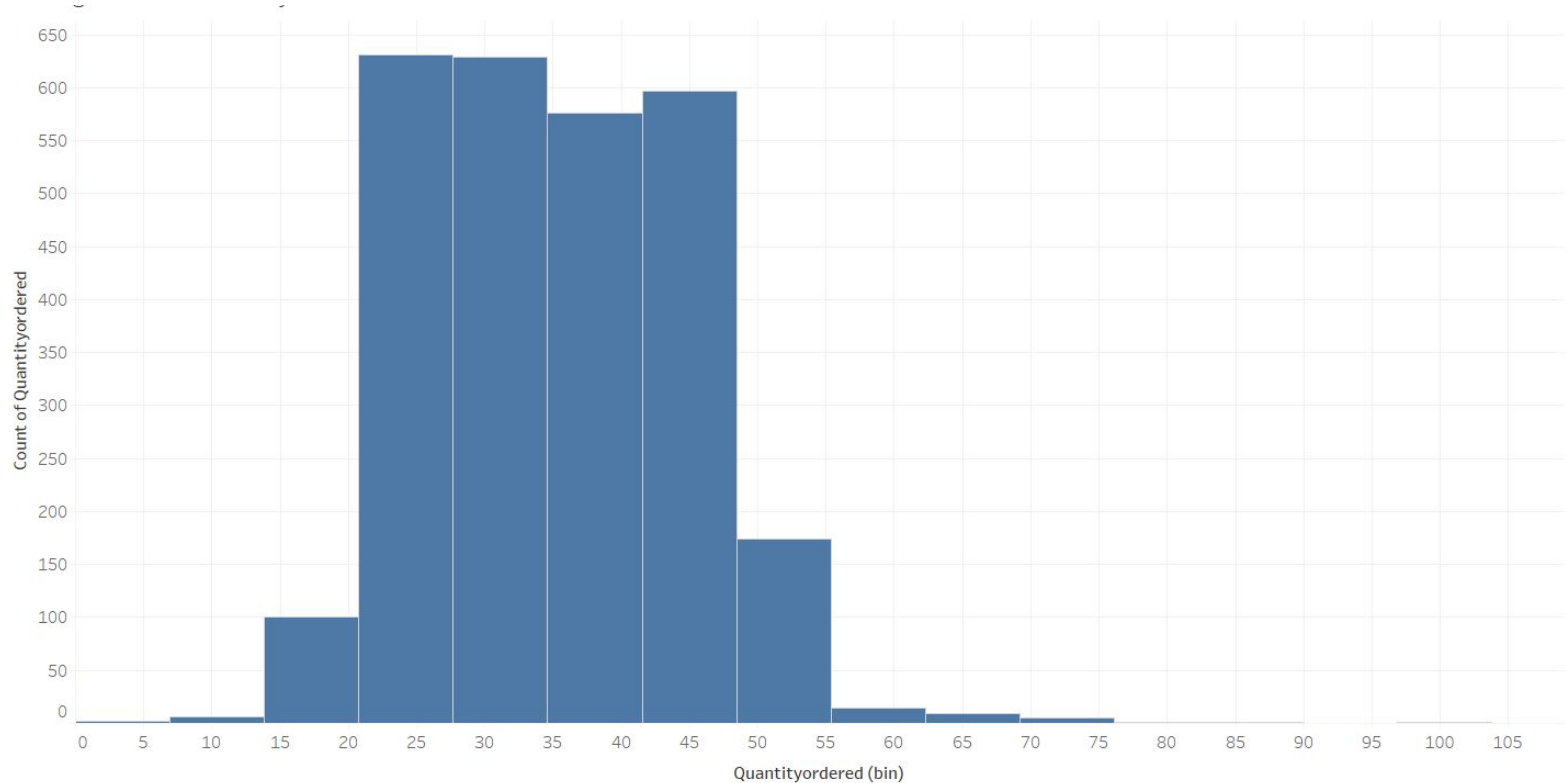
- Majority of the orders were worth ranging from 1000\$ to 8000\$



*Figure 5: Histogram of Sales*

# Histogram of quantity ordered

- Quantity placed in each order mostly was between 25-50.



*Figure 6: Histogram of Quantity ordered*

# Sales made by product lines

- As 'Classic cars' and 'Vintage cars' recorded highest number of orders, they have also recorded to majority of Sales.

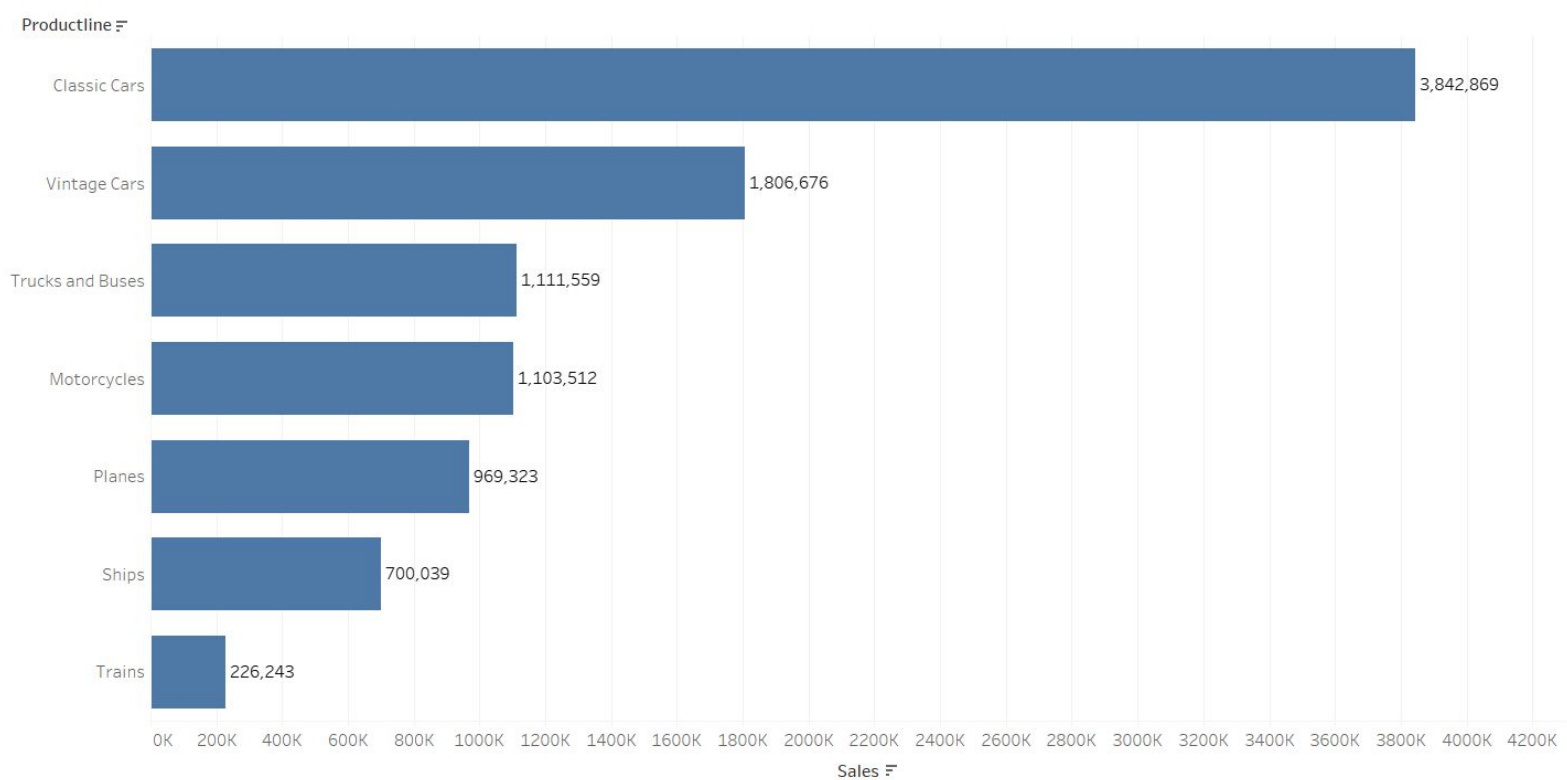
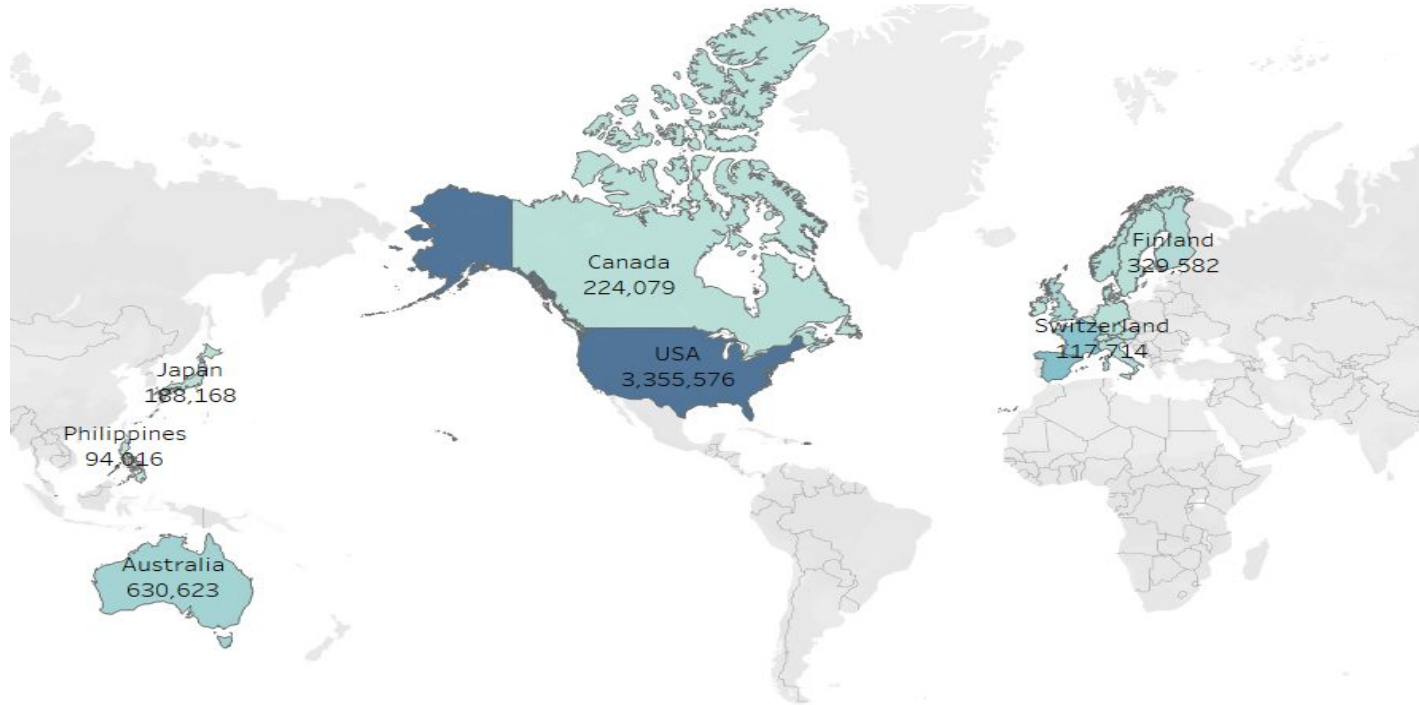


Figure 7: Sales along each product line

# Country wise Sales distribution

- USA has contributed to highest amount of Sales for the company.



*Figure 8: Sales distribution across countries*

# Yearly Sales trend

- Sales are increasing year by year. Sales of 2020 have been recorded till February. If the same pace continues, company is going to record around \$ 5M sales in 2020.

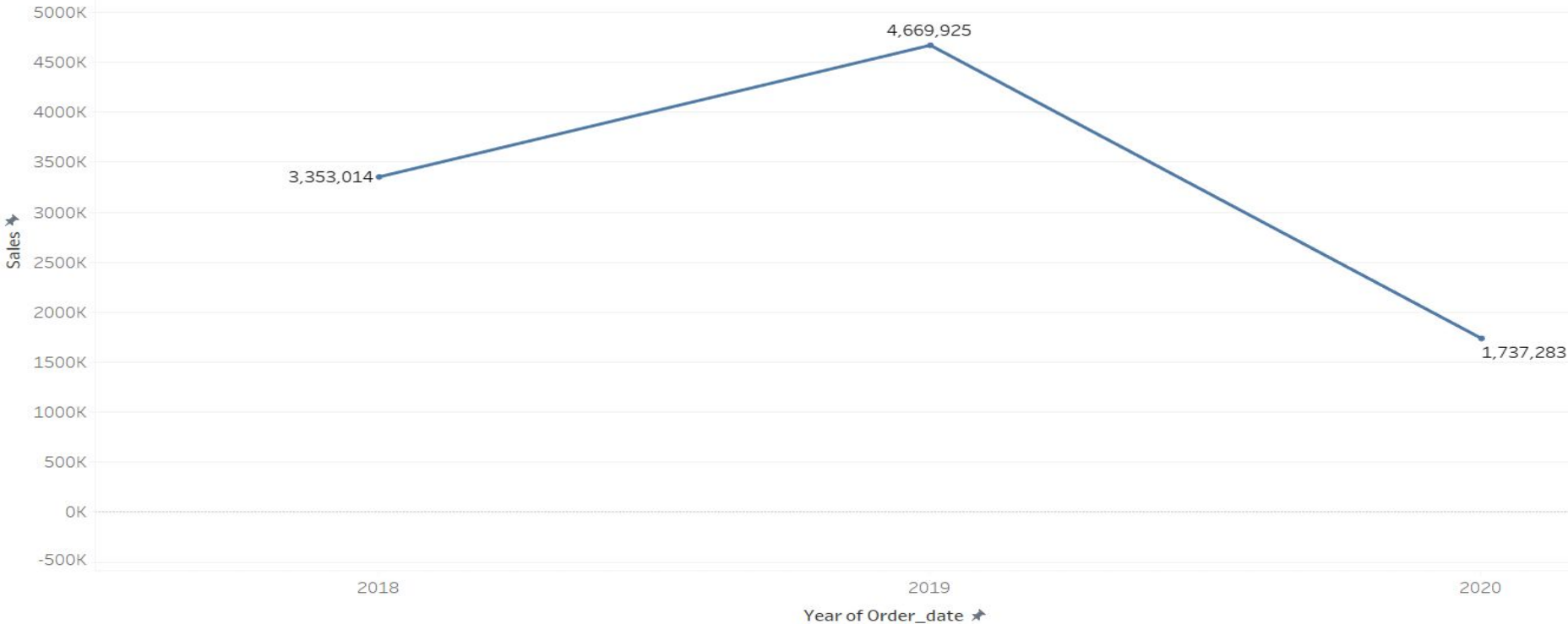
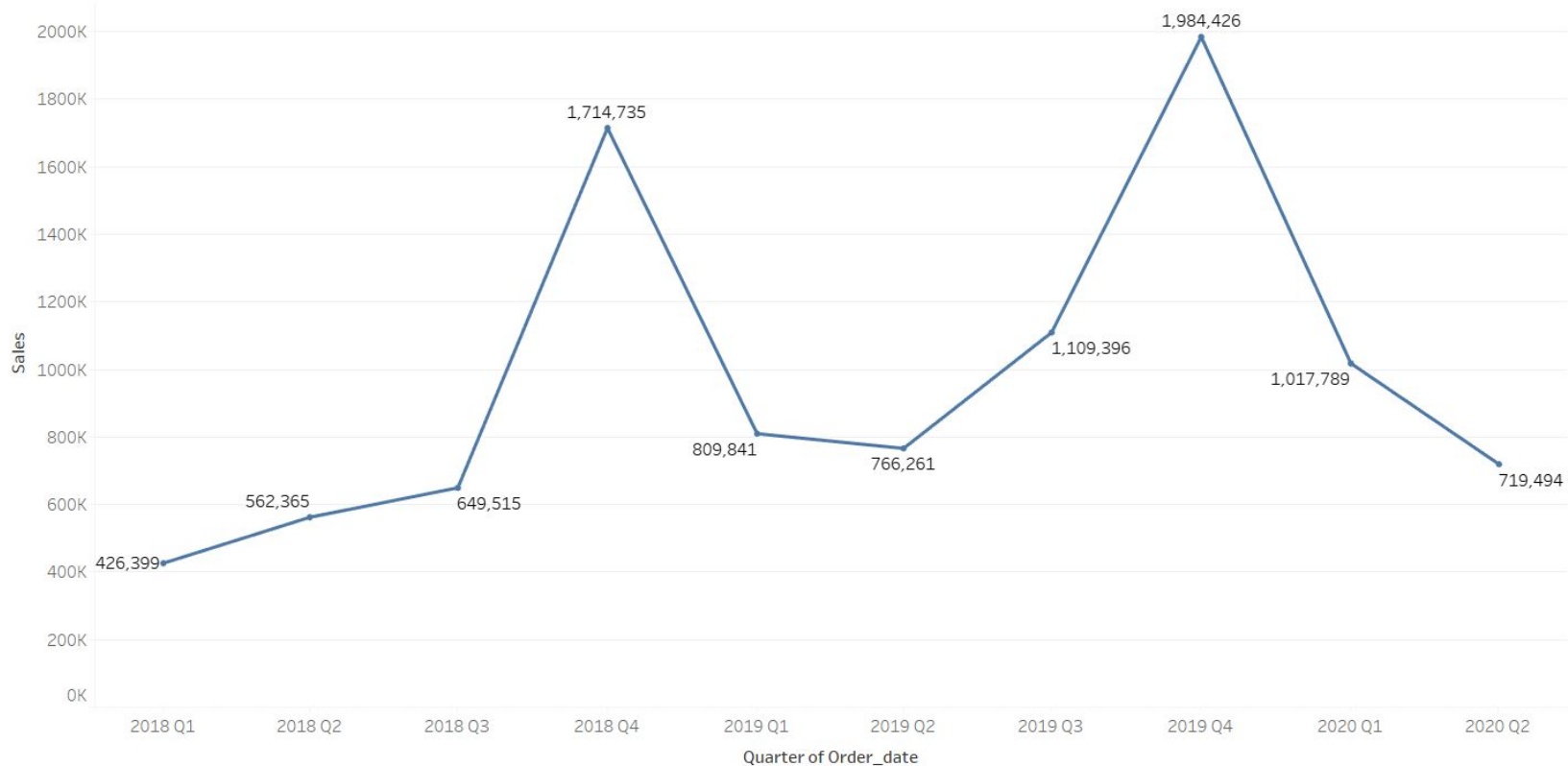


Figure 9: Yearly Sales trend

# Quarterly Sales trend

- Highest Sales were recorded in Q4 of 2018 and 2019. Least being Q1 and Q2 once each.





# Monthly Sales trend

- There is seasonality in Sales trend. Sales soar higher during August to December every year.

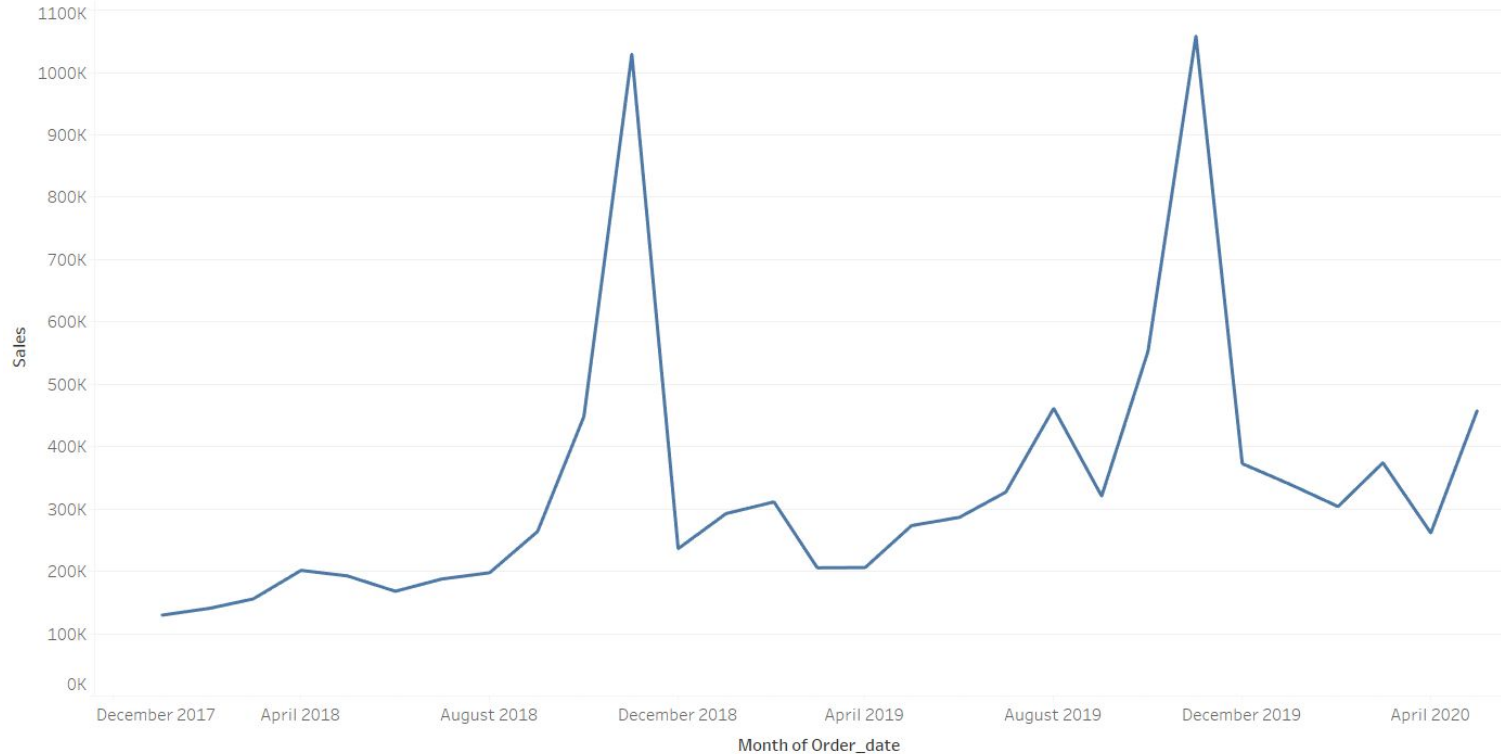


Figure 11: Monthly Sales trend

# Sales made by Deal size and Product line categories

- Trains have made least Sales in all Deal Sizes.
- Classic cars of Medium deal size have recorded highest sales followed by Vintage cars of Medium deal size.

Productline	Dealsize		
	Medium	Small	Large
Classic Cars	2,376,627	686,151	780,091
Vintage Cars	1,038,236	577,917	190,522
Motorcycles	643,014	309,419	151,079
Planes	535,071	362,221	72,032
Trucks and Buses	809,050	246,253	56,256
Trains	112,895	104,371	8,977
Ships	416,338	283,702	

Table 7: Sales generated by deal size and product line combinations

# Sales made by Deal size and Product line categories

- Size of the block represents total quantity ordered.
- Shade of the block represents sum of products in each product line category.

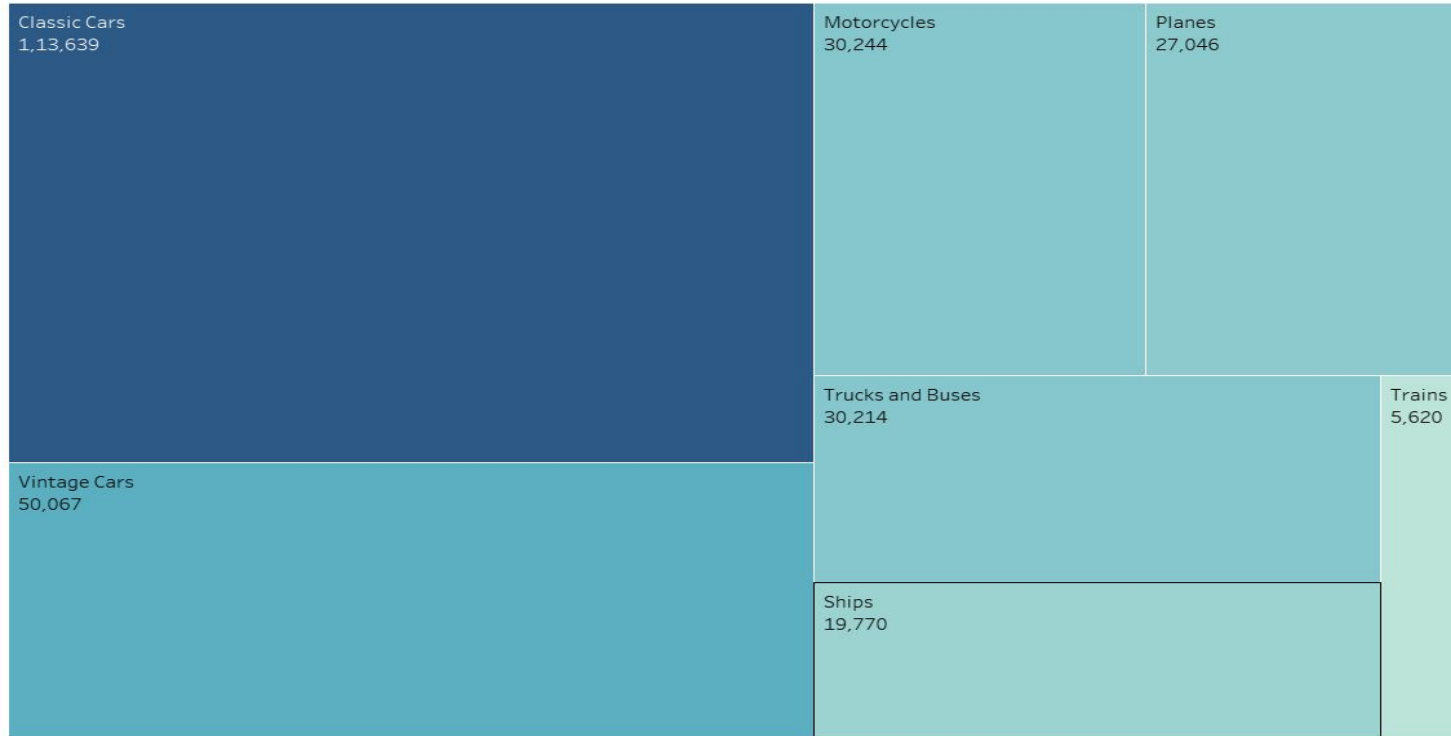


Figure 11: Top product lines making highest sales. Treemap

# Customer segmentation using RFM Analysis

# RFM Analysis

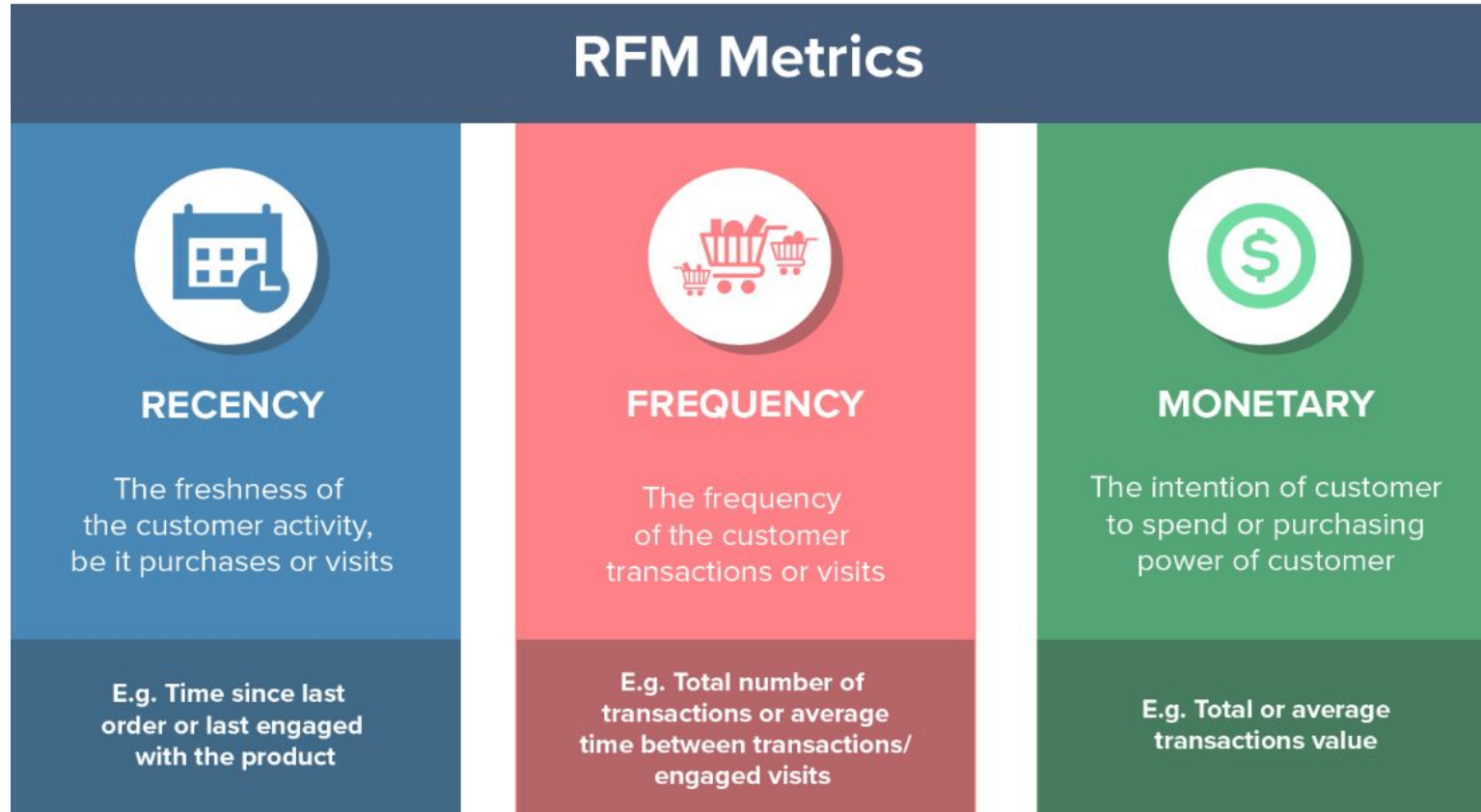


Figure 12: Recency - Frequency - Monetary illustration

# RFM Analysis

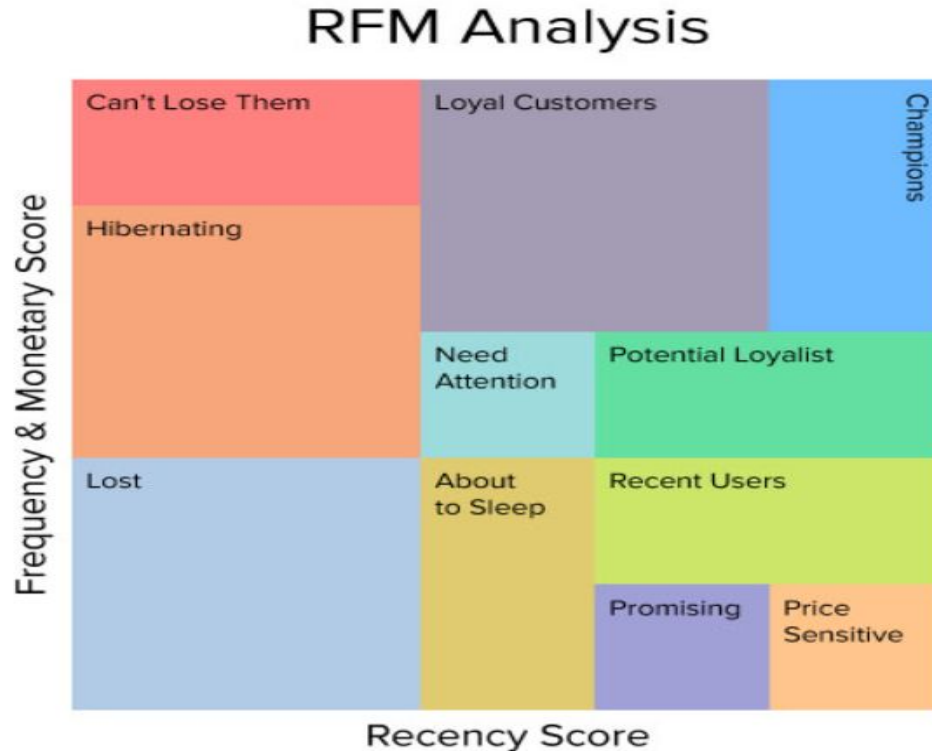


Figure 13: Segmentation of customers by RFM analysis

- Based on RFM scores, customers may be divided into different clusters.
- The clusters are named as shown in the image to the left.
- For example, customers belonging to Can't lose them category have low recency, high frequency and monetary values.
- Frequency and monetary increase from bottom to top.
- Recency increases from left to right.

# RFM Analysis

- Recency, frequency, monetary value (RFM) is a model used in marketing analysis that segments a company's consumer base by their purchasing patterns or habits.
- It evaluates customers' *recency* (how long ago they made a purchase), *frequency* (how often they make purchases), and *monetary value* (how much money they spend).
- RFM is then used to identify a company's or an organization's best customers by measuring and analyzing spending habits to improve low-scoring customers and maintain high-scoring ones.
- It assigns a score of 1 to 5 (from worst to best) for customers in each of the three categories.
- For each attribute (recency, frequency, and monetary value), customers are given a score from 1 (lowest) to 5 (best) based on their observed purchasing behavior.
- The grading may vary and depends on the size of the data studied and the business use case.
- The ideal customer would therefore have a score of 5, 5, 5 for these three factors.

# Parameters used in RFM analysis

- We study three parameters in RFM Analysis
  - The **recency factor** is based on the notion that the more recently a customer has made a purchase with a company, the more likely they will continue to keep the business and brand in mind for subsequent purchases. This information can be used to remind recent customers to revisit the business soon to continue meeting their purchase needs.
  - The **frequency** of a customer's transactions may be affected by factors such as the type of product, the price point for the purchase, and the need for replenishment or replacement. Predicting this can assist marketing efforts directed at reminding the customer to visit the business again.
  - **Monetary** value stems from how much the customer spends. A natural inclination is to put more emphasis on encouraging customers who spend the most money to continue doing so. While this can produce a better return on investment (ROI) in marketing and customer service, it also runs the risk of alienating customers who have been consistent but have not spent as much with each transaction.



# Assumptions made in RFM analysis

- Data needs to be obtained at customer and individual order or purchase level.
- This helps calculate the frequency and monetary parameters of RFM analysis.
- Either Order dates of all the orders made by the customers needs to be available or days since customer last interacted with the business needs to be available.
- Customers are well segmented into groups or clusters after applying RFM analysis.

# RFM Analysis using KNIME

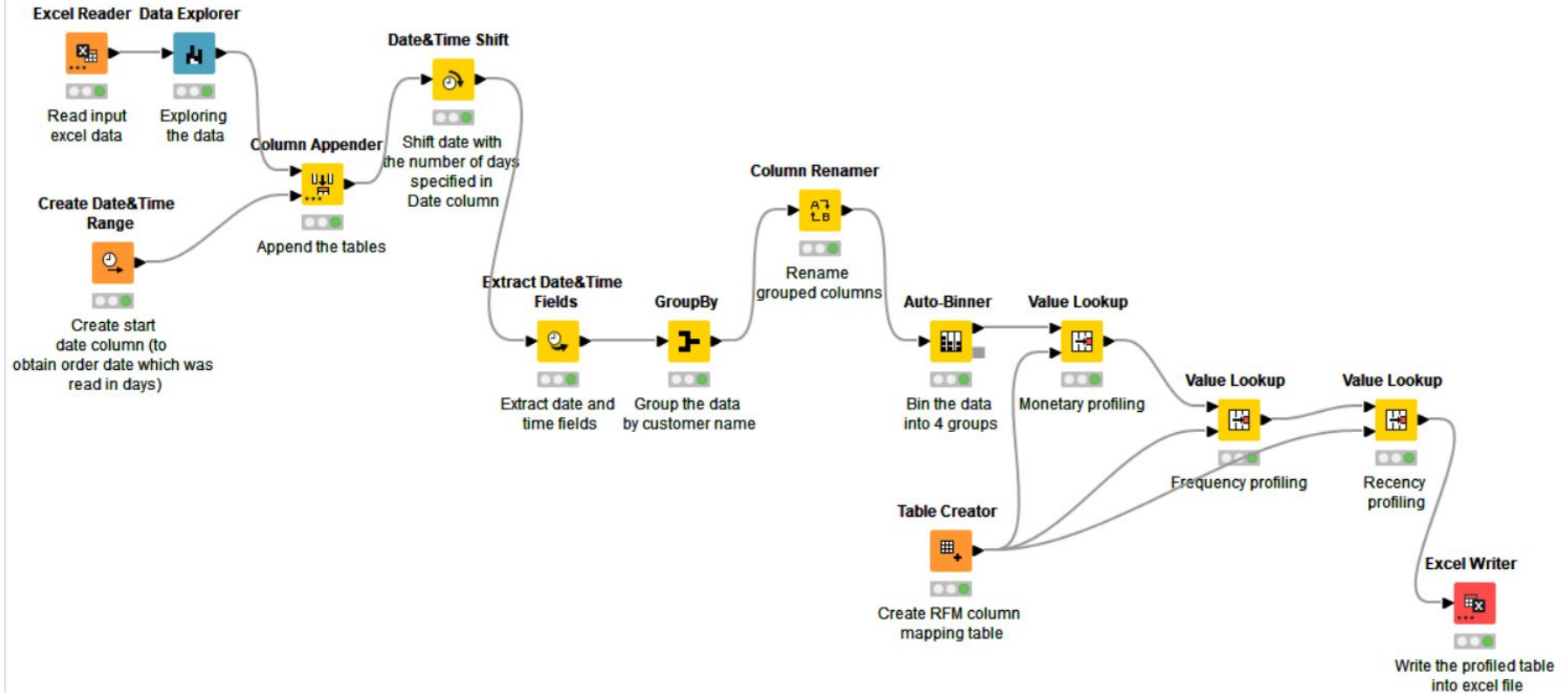


Figure 14: KNIME workflow - RFM analysis on Auto Sales data

# Steps performed for RFM Analysis using KNIME

- Data is read using Excel reader.
- Glimpse of the table:

○

Table "default" - Rows: 2747 Spec - Columns: 20 Properties Flow Variables															
Row ID	I ORDER...	I QUANT...	D PRICE...	I ORDER...	D SALES	I ORDER...	I DAYS_...	S STATUS	S PRODU...	I MSRP	S PRODU...	S CUSTOM...	S PHONE	S ADDRESSLINE1	S
Row0	10107	30	95.7	2	2,871	43155	828	Shipped	Motorcycles	95	S10_1678	Land of Toys Inc.	2125557818	897 Long Airport Avenue	NYC
Row1	10121	34	81.35	5	2,765.9	43227	757	Shipped	Motorcycles	95	S10_1678	Reims Collectables	26. 47. 1555	59 rue de l'Abbaye	Reim
Row2	10134	41	94.74	2	3,884.34	43282	703	Shipped	Motorcycles	95	S10_1678	Lyon Souvenirs	+33 1 46 62...	27 rue du Colonel Pierr...	Paris
Row3	10145	45	83.26	6	3,746.7	43337	649	Shipped	Motorcycles	95	S10_1678	Toys4GrownUp...	6265557265	78934 Hillside Dr.	Pasa
Row4	10168	36	96.66	1	3,479.76	43401	586	Shipped	Motorcycles	95	S10_1678	Technics Stores...	6505556809	9408 Furth Circle	Burli
Row5	10180	29	86.13	9	2,497.77	43415	573	Shipped	Motorcycles	95	S10_1678	Daedalus Desig...	20. 16. 1555	184, chausse de Tournai	Lille
Row6	10188	48	114.84	1	5,512.32	43422	567	Shipped	Motorcycles	95	S10_1678	Herkku Gifts	+47 2267 3...	Drammen 121, PR 744 ...	Berg
Row7	10211	41	114.84	14	4,708.44	43480	510	Shipped	Motorcycles	95	S10_1678	Auto Canal Petit	(1) 47. 55. 6...	25, rue Lauriston	Paris
Row8	10223	37	107.18	1	3,965.66	43516	475	Shipped	Motorcycles	95	S10_1678	Australian Colle...	03 9520 4555	636 St Kilda Road	Melb
Row9	10237	23	101.44	7	2,333.12	43560	432	Shipped	Motorcycles	95	S10_1678	Vitachrome Inc.	2125551500	2678 Kingston Rd.	NYC
Row10	10251	28	113.88	2	3,188.64	43603	390	Shipped	Motorcycles	95	S10_1678	Tekni Collectabl...	2015559350	7476 Moss Rd.	New
Row11	10263	34	108.14	2	3,676.76	43644	350	Shipped	Motorcycles	95	S10_1678	Gift Depot Inc.	2035552570	25593 South Bay Ln.	Bridg

Table 8: Viewing the dataset using KNIME

# Steps performed for RFM Analysis using KNIME

- Info of the data shown by KNIME:

Columns: 20	Column Type	Column Index	Color Handler	Size Handler	Shape Han...	Filter Handler	Lower Bound	Upper Bound	Value 0	Value 1	Value 2
ORDERNUMBER	Number (integer)	0					10,100	10,425	?	?	?
QUANTITYORDERED	Number (integer)	1					6	97	?	?	?
PRICEEACH	Number (double)	2					26.88	252.87	?	?	?
ORDERLINENUMBER	Number (integer)	3					1	18	?	?	?
SALES	Number (double)	4					482.13	14,082.8	?	?	?
ORDERDATEINDAYS	Number (integer)	5					43,106	43,982	?	?	?
DAYS_SINCE_LASTORDER	Number (integer)	6					42	3,562	?	?	?
STATUS	String	7					?	?	Shipped	Disputed	In Process
PRODUCTLINE	String	8					?	?	Motorcycles	Classic Cars	Trucks and ...
MSRP	Number (integer)	9					33	214	?	?	?
PRODUCTCODE	String	10					?	?	?	?	?
CUSTOMERNAME	String	11					?	?	?	?	?
PHONE	String	12					?	?	?	?	?
ADDRESSLINE1	String	13					?	?	?	?	?
CITY	String	14					?	?	?	?	?
POSTALCODE	String	15					?	?	?	?	?
COUNTRY	String	16					?	?	USA	France	Norway
CONTACTLASTNAME	String	17					?	?	?	?	?
CONTACTFIRSTNAME	String	18					?	?	?	?	?
DEALSIZE	String	19					?	?	Small	Medium	Large

Table 8: Basic information of the dataset through KNIME

# Steps performed for RFM Analysis using KNIME

- Date column from the excel file has been read as number of days from 1971-12-30.
- Created a column with the above date. Added the number of days in each column to this start date.
- This gives the order date of each order.
- The data has been grouped by customer name.
- Sales are aggregated using the measure SUM. This column is used for monetary analysis.
- DAYS\_SINCE\_LAST\_ORDER is aggregated using the measure MINIMUM. This gives the most recent date on which customer interacted with the business. This column is used for recency analysis.
- ORDERNUMBER has been aggregated with the measure COUNT. This gives the number of orders placed by the customer. This column is used for frequency analysis.
- The data has been binned into 4 groups/bins.
  - Bin1 - 0-25th percentile
  - Bin2 - 25th-50th percentile
  - Bin3 - 50th-75th percentile
  - Bin4 - 75th - 100th percentile

# Steps performed for RFM Analysis using KNIME

- Bins 1,2,3 and 4 are classified as Bad, Average, Above Average, Good respectively for frequency and monetary columns
- Bins 1,2,3 and 4 are classified as Good, Above Average, Average and Bad respectively for recency column.
- The resultant data after classifying the customers.
- The clusters have been created for monetary, frequency and recency columns respectively.

# Results in the output table head

Table "default" - Rows: 89 Spec - Columns: 13 Properties Flow Variables

Row ID	S CUSTO...	I Sum(Q...	D Sum(PR...	D Monetary	I Recency	I MSRP_...	I Freque...	S Moneta...	S Recenc...	S Freque...	S Moneta...	S Freque...	S Recenc...
Row0	AV Stores, Co.	1778	4,645.31	157,807.81	421	4735	51	Bin 4	Bin 3	Bin 4	Good	Good	Average
Row1	Alpha Cognac	687	2,023.2	70,488.44	675	1943	20	Bin 1	Bin 4	Bin 1	Bad	Bad	Bad
Row2	Amica Model...	843	2,882.17	94,117.26	328	2799	26	Bin 3	Bin 2	Bin 2	Above aver...	Average	Above Aver...
Row3	Anna's Decor...	1469	4,895.51	153,996.13	131	4817	46	Bin 4	Bin 1	Bin 4	Good	Good	Good
Row4	Atelier graph...	270	645.67	24,179.96	312	669	7	Bin 1	Bin 2	Bin 1	Bad	Bad	Above Aver...
Row5	Australian C...	705	2,070.96	64,591.46	1018	2027	23	Bin 1	Bin 4	Bin 2	Bad	Average	Bad
Row6	Australian C...	1926	5,752.46	200,995.41	229	5694	55	Bin 4	Bin 1	Bin 4	Good	Good	Good
Row7	Australian Gi...	545	1,658.31	59,469.12	190	1673	15	Bin 1	Bin 1	Bin 1	Bad	Bad	Good
Row8	Auto Assoc. ...	637	1,790.78	64,834.32	275	1807	18	Bin 1	Bin 2	Bin 1	Bad	Bad	Above Aver...

Table 9: KNIME workflow output table after RFM analysis

## Inferences from RFM Analysis and Identified Segments



# Top 10 best customers

- Below are the customers that provide good monetary and purchase value to the business.
- They fall into the category of customers having good recency, frequency and monetary profiles.

A	B	C	D	E	F	G
CUSTOMERNAME	Recency	Frequency	Monetary	Recency_profiling	Frequency_profiling	Monetary_profiling
Anna's Decorations, Ltd	131	46	153996.13	Good	Good	Good
Australian Collectors, Co.	229	55	120783.07	Good	Good	Good
Euro Shopping Channel	42	259	131685.3	Good	Good	Good
La Rochelle Gifts	139	53	149798.63	Good	Good	Good
Land of Toys Inc.	216	49	151570.98	Good	Good	Good
Mini Gifts Distributors Ltd.	219	180	160010.27	Good	Good	Good
Online Diecast Creations Co.	253	34	164069.44	Good	Good	Good
Salzburg Collectables	188	40	180124.9	Good	Good	Good
Souvenirs And Things Co.	186	46	200995.41	Good	Good	Good
Technics Stores Inc.	241	34	654858.06	Good	Good	Good
The Sharp Gifts Warehouse	182	40	912294.11	Good	Good	Good

*Table 10: List of best customers*

# Customers who are on the verge of churning

- Customers who show low recency and average frequency are said to be on the verge of churning.
- These are the customers that need to be concentrated to get them back as they have given good monetary value to the business in the past.

CUSTOMERNAME	Recency	Frequency	Monetary	Recency_profiling	Frequency_profiling	Monetary_profiling
Australian Collectables, Ltd	1018	23	64591.46	Bad	Average	Bad
Blauer See Auto, Co.	705	22	85171.59	Bad	Average	Average
Cruz & Sons Co.	971	26	94015.73	Bad	Average	Above average
Dragon Souvenirs, Ltd.	649	43	172989.68	Bad	Good	Good
Enaco Distributors	659	23	78411.86	Bad	Average	Average
Marseille Mini Autos	757	25	74936.14	Bad	Average	Average
Norway Gifts By Mail, Co.	825	24	79224.23	Bad	Average	Average
Rovelli Gifts	1032	48	137955.72	Bad	Good	Good
Signal Gift Stores	657	29	82751.08	Bad	Above average	Average
Stylish Desk Decors, Co.	702	26	88804.5	Bad	Average	Above average
Toys4GrownUps.com	649	30	104561.96	Bad	Above average	Above average

Table 11: List of customers who are on the verge of churning

# Lost customers

- Lost customers are those who have done transactions in the past but have neither interacted with the business recently or frequently.
- In this case, out 89 customers 11 customers have turned out to be lost customers.

CUSTOMERNAME	Recency	Frequency	Monetary	Recency_profiling	Frequency_profiling	Monetary_profiling
Alpha Cognac	675	20	70488.44	Bad	Bad	Bad
Auto-Moto Classics Inc.	1353	8	26479.26	Bad	Bad	Bad
Bavarian Collectables Imports, Co.	801	14	34993.92	Bad	Bad	Bad
Clover Collections, Co.	659	16	57756.43	Bad	Bad	Bad
Diecast Collectables	672	18	70859.78	Bad	Bad	Average
Double Decker Gift Stores, Ltd	670	12	36019.04	Bad	Bad	Bad
Gift Ideas Corp.	947	19	57294.42	Bad	Bad	Bad
Iberia Gift Imports, Corp.	904	15	54723.62	Bad	Bad	Bad
Mini Auto Werke	717	15	52263.9	Bad	Bad	Bad
Royale Belge	737	8	33440.1	Bad	Bad	Bad
Signal Collectibles Ltd.	836	15	50218.51	Bad	Bad	Bad

Table 12: List of lost customers

# Loyal Customers

- Loyal customers who might be decently recent and frequent customers providing good monetary value to the business.
- The business can rely on targeting sales discounts on such group of customers as they are willing to do more transactions with the business also in near future.

CUSTOMERNAME	Recency	Frequency	Monetary	Recency_profiling	Frequency_profiling	Monetary_profiling
Corrida Auto Replicas, Ltd	407	32	120615.28	Above Average	Above average	Good
Reims Collectables	287	41	135042.94	Above Average	Good	Good
Scandinavian Gift Ideas	262	38	134259.33	Above Average	Good	Good
Amica Models & Co.	328	26	94117.26	Above Average	Average	Above average
Heintze Collectables	414	27	100595.55	Above Average	Above average	Above average
La Corne D'abondance, Co.	387	23	97203.68	Above Average	Average	Above average
Marta's Replicas Co.	292	27	103080.38	Above Average	Above average	Above average
Suominen Souvenirs	317	30	113961.15	Above Average	Above average	Above average
Tokyo Collectables, Ltd	259	32	120562.74	Above Average	Above average	Above average
Toms Spezialitten, Ltd	395	26	100306.58	Above Average	Average	Above average
Toys of Finland, Co.	259	30	111250.38	Above Average	Above average	Above average
AV Stores, Co.	421	51	157807.81	Average	Good	Good
Danish Wholesale Imports	499	36	145041.6	Average	Good	Good
L'ordine Souvenirs	493	39	142601.33	Average	Good	Good
Muscle Machine Inc	502	48	197736.94	Average	Good	Good
Saveley & Henriot, Co.	586	41	142874.25	Average	Good	Good
Handji Gifts & Co	488	36	115498.73	Average	Good	Above average
Herkku Gifts	567	29	111640.28	Average	Above average	Above average
Mini Creations Ltd.	595	35	108951.13	Average	Good	Above average

# Inferences from identified segments using RFM analysis

- There are total of 89 customers who have interacted with the company.
- The average monetary value rendered from the customers is around \$1M.
- 22 customers out of 89 have not interacted with the company with any orders recently.
- 37 out of 89 customers are frequently interacting with the company with orders.
- Since the company deals with selling vehicles monetary parameter plays key role in determining the sales velocity.
- Around half of the customers provided good and above average monetary value to the business.