MARKETING & RETAIL ANALYTICS

GROCERY STORE DATA

○ RFM MILESTONE 1 – DIVYA VIKRAM

Agenda

Agenda of this project is to find the underlying buying patterns of the customers of an Automobile parts manufacturing company based on the past 3 years of the Company's transaction data and recommend them customized marketing strategies for different segments of customers.

Executive Summary

We have 3 years of data of an Automobile parts manufacturing company consisting of 2747 customer purchase records with 20 variables . The company has 89 customers, spread across 19 countries and 71 cities . There are 298 unique orders with each order containing multiple line items

There are 109 unique products belonging to 7 product categories on offer . The Marketing strategy is to segment the customers based on the buying patterns

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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

Data Summary

- There are 2747 records and 20 variables in the dataset.

Column Information

```
Column                   Non-Null Count   Dtype
------                   --------------   -----
ORDERNUMBER              2747 non-null    int64
QUANTITYORDERED          2747 non-null    int64
PRICEEACH                2747 non-null    float64
ORDERLINENUMBER          2747 non-null    int64
SALES                    2747 non-null    float64
ORDERDATE                2747 non-null    datetime64[ns]
DAYS_SINCE_LASTORDER     2747 non-null    int64
STATUS                   2747 non-null    object
PRODUCTLINE              2747 non-null    object
MSRP                     2747 non-null    int64
PRODUCTCODE              2747 non-null    object
CUSTOMERNAME             2747 non-null    object
PHONE                    2747 non-null    object
ADDRESSLINE1             2747 non-null    object
CITY                     2747 non-null    object
POSTALCODE               2747 non-null    object
COUNTRY                  2747 non-null    object
CONTACTLASTNAME          2747 non-null    object
CONTACTFIRSTNAME         2747 non-null    object
DEALSIZE                 2747 non-null    object
```

Top 5 records of dataset

ORDERNUMBER	10107	10121	10134	10145	10168
QUANTITYORDERED	30	34	41	45	36
PRICEEACH	95.7	81.35	94.74	83.26	96.66
ORDERLINENUMBER	2	5	2	6	1
SALES	2871.0	2765.9	3884.34	3746.7	3479.76
ORDERDATE	2018-02-24 00:00:00	2018-05-07 00:00:00	2018-07-01 00:00:00	2018-08-25 00:00:00	2018-10-28 00:00:00
DAYS_SINCE_LASTORDER	828	757	703	649	586
STATUS	Shipped	Shipped	Shipped	Shipped	Shipped
PRODUCTLINE	Motorcycles	Motorcycles	Motorcycles	Motorcycles	Motorcycles
MSRP	95	95	95	95	95
PRODUCTCODE	S10_1678	S10_1678	S10_1678	S10_1678	S10_1678
CUSTOMERNAME	Land of Toys Inc.	Reims Collectables	Lyon Souveniers	Toys4GrownUps.com	Technics Stores Inc.
PHONE	2125557818	26.47.1555	+33 1 46 62 7555	6265557265	6505556809
ADDRESSLINE1	897 Long Airport Avenue	59 rue de l'Abbaye	27 rue du Colonel Pierre Avia	78934 Hillside Dr.	9408 Furth Circle
CITY	NYC	Reims	Paris	Pasadena	Burlingame
POSTALCODE	10022	51100	75508	90003	94217
COUNTRY	USA	France	France	USA	USA
CONTACTLASTNAME	Yu	Henriot	Da Cunha	Young	Hirano
CONTACTFIRSTNAME	Kwai	Paul	Daniel	Julie	Juri
DEALSIZE	Small	Small	Medium	Medium	Medium

- There is 1 datetime64[ns], 2 float64, 5 int64 and 12 object type data types in the dataset .

- There are no null values in the dataset

- There are no duplicates in the dataset .

The 5 point Summary of numeric variables and inferences

	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

▪

- There are 298 unique ORDERNUMBERS with multiple sub-orders . Suborders indicated by variable ORDERLINENUMBERranges from 1 to 18.

- Minimum QUANTITYORDERED is 6 and maximum is 97. Average QUANTITYORDERED is 35.

- Minimum PRICEEACH is $26.88 and max PRICEEACH is $252.87. Average PRICEEACH is $101.

- Minimum SALES Value is $482.13 and Maximum SALES Value is $14082.80 . Average SALES Value is $3553.

- Minimum DAYS_SINCE_LASTORDER Value is 42 and maximum DAYS_SINCE_LASTORDER Value is 3562 . Average DAYS_SINCE_LAST ORDER is 1757.

- Minimum MSRP (Manufacturer's Suggested Retail Price) of a product is $33 and Maximum MSRP of product is $214. Average MSR P is $100.7.

Data Summary of categorical variables.

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

o There are 6 unique STATUS codes namely Shipped, Cancelled, Resolved, On-hold,

  In Process, Disputed. Majority of the orders are shipped .

o There are 7 unique PRODUCTLINE codes namely Classic Cars, Vintage Cars,

  Motorcycles, Planes ,Trucks & Buses, Ships and Trains.

  Classic cars is the most popular product line

o There are 109 unique PRODUCTCODE values and S18_3232 is the most ordered product

o There are 89 unique CUSTOMERNAME values and Euro Shopping Channel is CUSTOMERNAME with most number of records

o There are 19 unique COUNTRY names . USA has the highest occurrence

o There are 71 unique CITY names. Madrid   has the highest occurrence

o DEALSIZE medium is highest in numbers.

o Variables PHONE has 88 unique values ,ADDRESSLINE1 has 89 unique values ,postal Code has 73 unique values , Contact Last Name has 76 , Contact First Name has 72 unique values

Assumptions

Variables Phone,Addressline1,postal Code, Contact Last Name, Contact First Name are redundant columns and not of any importance for our analysis.

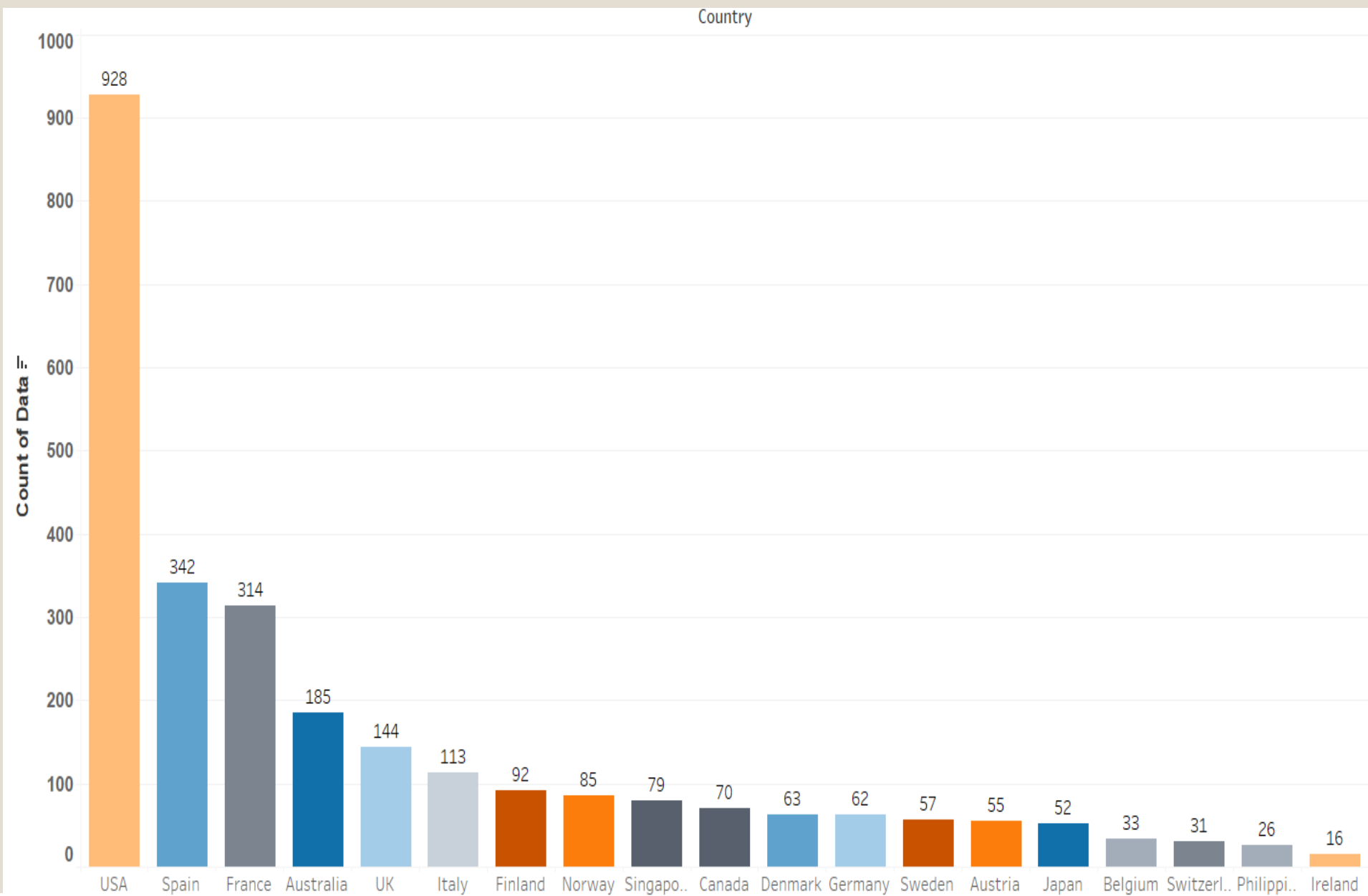All transactions are assumed to be in Dollars.

Cancelled orders are not considered for analysis, its assumed that these orders were not placed .

Column named "DAYS_SINCE_LASTORDER" will be dropped and wont be used for our analysis. It wont help us in the analysis because date from which the days since last order has been counted has not been mentioned. This may lead to erroneous analysis if considered . Instead we will assume that data has been provided as of today and all our date related calculations will have base date as today.

Exploratory Data Analysis

Univariate Analysis

Countries with number of transactions

Country

	Count of Data
USA	928
Spain	342
France	314
Australia	185
UK	144
Italy	113
Finland	92
Norway	85
Singapo..	79
Canada	70
Denmark	63
Germany	62
Sweden	57
Austria	55
Japan	52
Belgium	33
Switzerl..	31
Philippi..	26
Ireland	16

Top 10 Customer Records with highest number of transactions

Euro Shopping Channel	259
Mini Gifts Distributors Lt..	180
Australian Collectors, Co.	55
La Rochelle Gifts	53
AV Stores, Co.	51
Land of Toys Inc.	49
Rovelli Gifts	48
Muscle Machine Inc	48
Souveniers And Things ..	46
Anna's Decorations, Ltd	46

Top 10 Customer Records with lowest number of transactions

Bavarian Collectables Im..	14
West Coast Collectables ..	13
CAF Imports	13
Double Decker Gift Store..	12
Cambridge Collectables ..	11
Microscale Inc.	10
Royale Belge	8
Auto-Moto Classics Inc.	8
Atelier graphique	7
Boards & Toys Co.	3

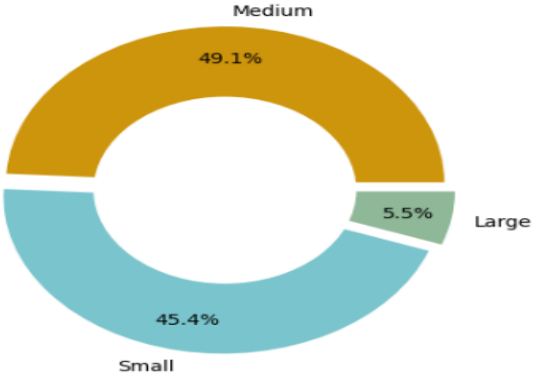# Cities with number of transactions

| City	Count
Madrid	304
San Rafael	
NYC	
Singapore	
Paris	
New Bedford	60
Nantes	
Melbourne	
Manchester	
Bergamo	
Brickhaven	
North Sydney	46
Chatswood	
Philadelphia	
Boston	
Reims	
Lyon	
San Jose	40
Salzburg	
Reggio Emilia	
London	
Cambridge	38
Boras	
Kobenhavn	
Nashua	
Burlingame	
Stavern	32
Oulu	
Minato-ku	
Gensve	
Allentown	
Pasadena	30
Helsinki	
Espoo	
Liverpool	
Las Vegas	29
Bergen	
Aarhus	
White Plains	26
Tsawassen	
Torino	
Makati City	26
Koln	
Cowes	
San Diego	
Marseille	25
Bruxelles	
Bridgewater	
Oslo	
Glen Waverly	23
Barcelona	
Vancouver	22
Montreal	
Glendale	
Frankfurt	
Newark	
Toulouse	20
Osaka	
Lille	
Strasbourg	19
Lule	
Versailles	
New Haven	
Dublin	
South Brisbane	15
Sevilla	
Graz	
Brisbane	
Munich	14
Burbank	
Charleroi	

Count of Data

PRODUCTLINE

- Classic Cars — 34.5%
- Trains — 2.8%
- Ships — 8.4%
- Trucks and Buses — 10.7%
- Planes — 11.1%
- Motorcycles — 11.4%
- Vintage Cars — 21.1%

Order Status

- Shipped — 92.5%
- Disputed — 0.5%
- In Process — 1.5%
- On Hold — 1.6%
- Resolved — 1.7%
- Cancelled — 2.2%

DEALSIZE

- Medium — 49.1%
- Large — 5.5%
- Small — 45.4%

Inferences from Univariate Analysis of Categorical Variables

- Maximum number of transactions are from country USA .Least number of transactions are from Ireland.
- Maximum number of transactions are from City Madrid in Spain .Least number of transactions are from Charleroi in Belgium .
- In terms of number of transactions placed, Of the 89 customers , Euro shopping channel has maximum of 259 transactions followed by Mini Gifts distributors Ltd with 180 transactions. Boards and Toys Co has only 3 transactions
- Parts for Classic cars are most ordered followed by Vintage Cars . Parts for Trains are least ordered .
- 49.1% of the deals are of medium size, 45.4 % deal are of Small . Only 5.5 % deal are Large in size.
- 92.5 % of the orders are in shipped status.

Univariate Analysis of Sales

Sales per order
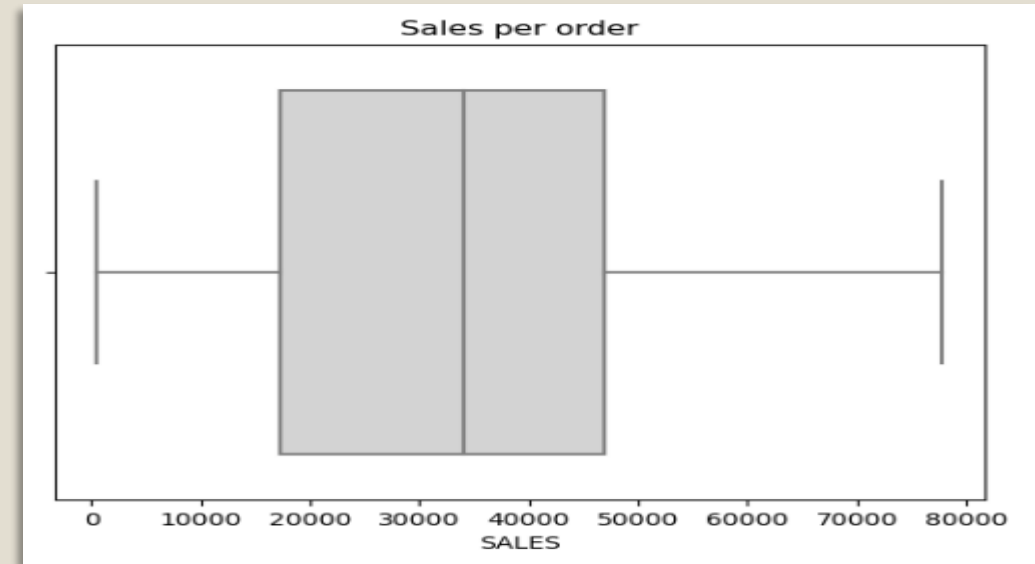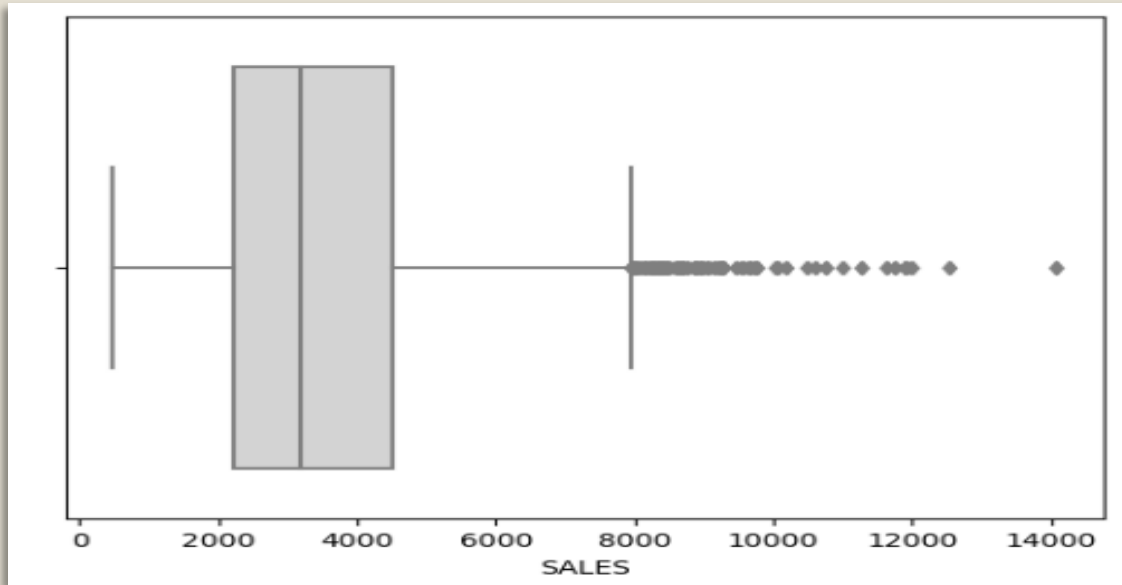
Inferences

- Total sales is $ 9.76 M. Average Sales is $ 3553.
- The Hist Plot of Sales indicates that maximum number of transactions have sales between $2K to $3K.
- Boxplot of sales shows that there are outliers in the sales data. Minimum Sales Value is $482.13 and Maximum Sales Value is $14082.80 . Average Sales Value is $3553
- In the Box plot of Sales per order, maximum sale amount for an order is $77.8K and lowest sales for an order is $554. Average Sales per order is $32.7K
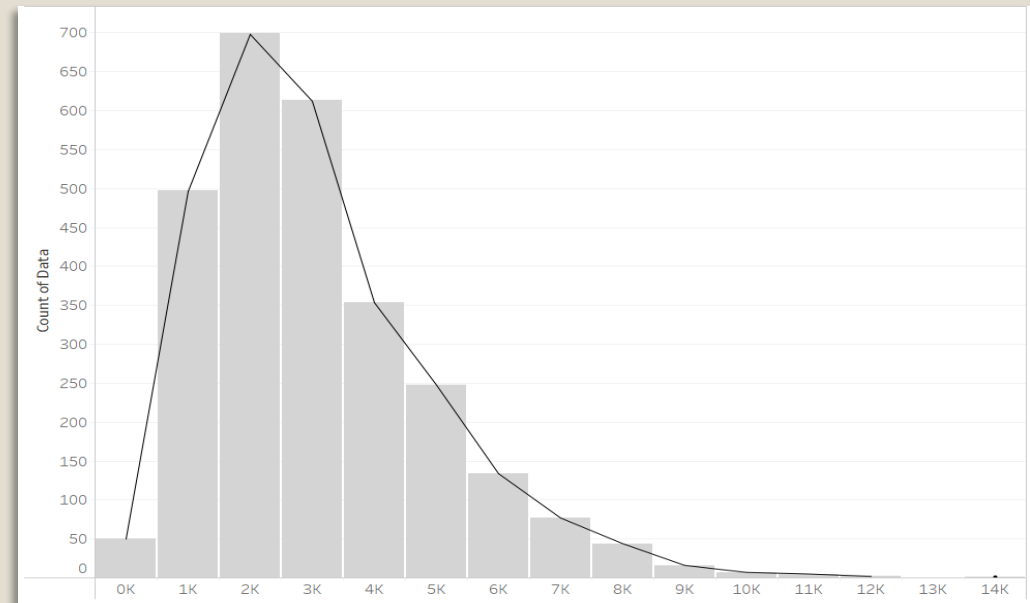
Univariate Analysis of PRICEEACH
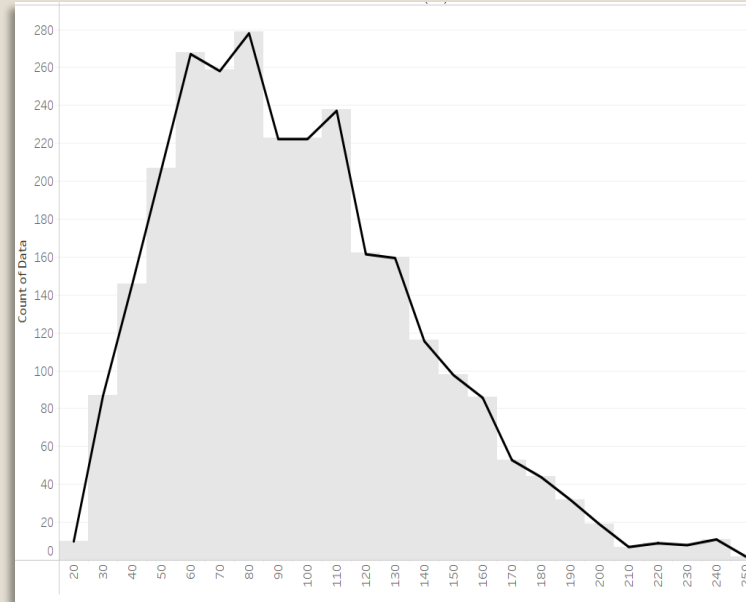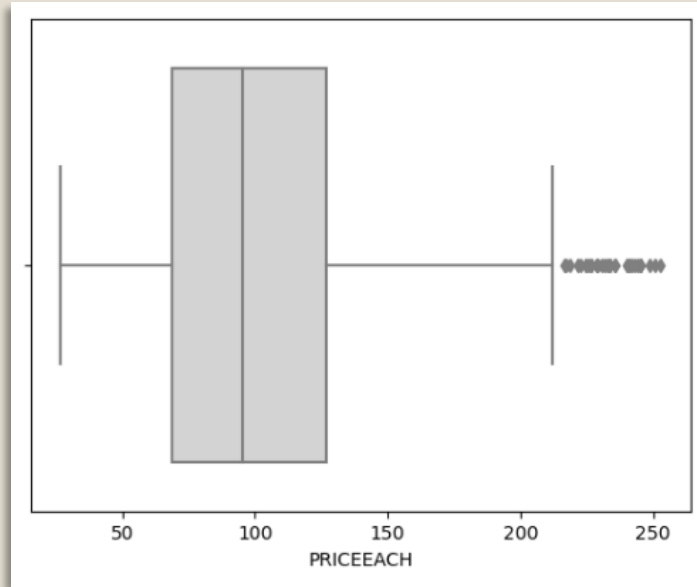
- Boxplot shows that there are outliers in price of products.
- Max price of a product is $252.87 and Min price of a product is $26.88 . Average price of a product is $101
- Histplot shows that most products are priced between $80 to $90.

Univariate Analysis of MSRP
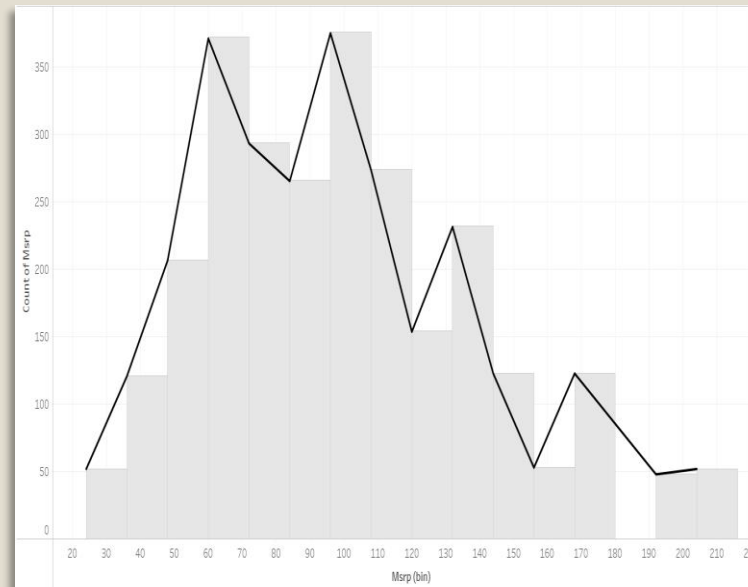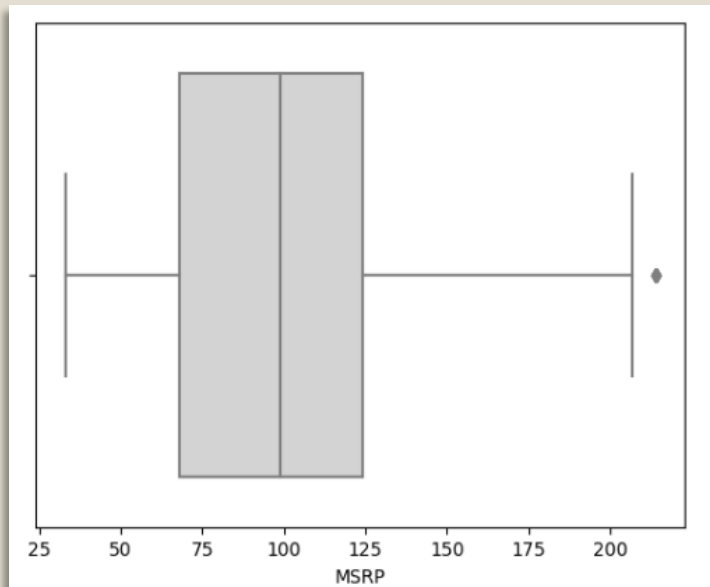
- Boxplot shows that there are not many outliers in MSRP of products. Max MSRP of a product is $214.
- Min MSRP of a product is $33 . Average MSRP is $100.7
- Histplot shows that most products are priced between $60 to $70 and $100 to $110.

Univariate Analysis of QUANTITYORDERED
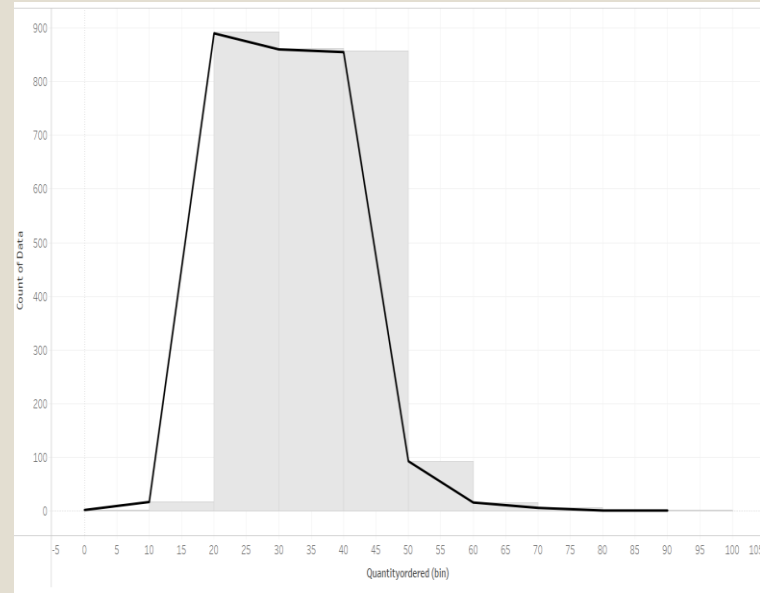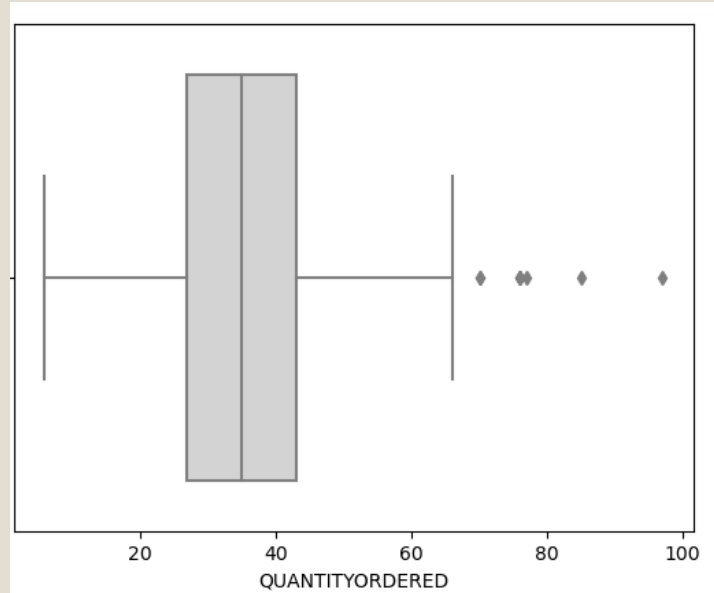
- Boxplot shows that there are outliers in price of products.
- Minimum QUANTITYORDERED is 6 and maximum is 97. Average QUANTITYORDERED is 35
- Histplot shows that most transactions have quantities between 20 and 40.

Bivariate Analysis

Sales by Country

Sales by Customers

Sales by ProductLine
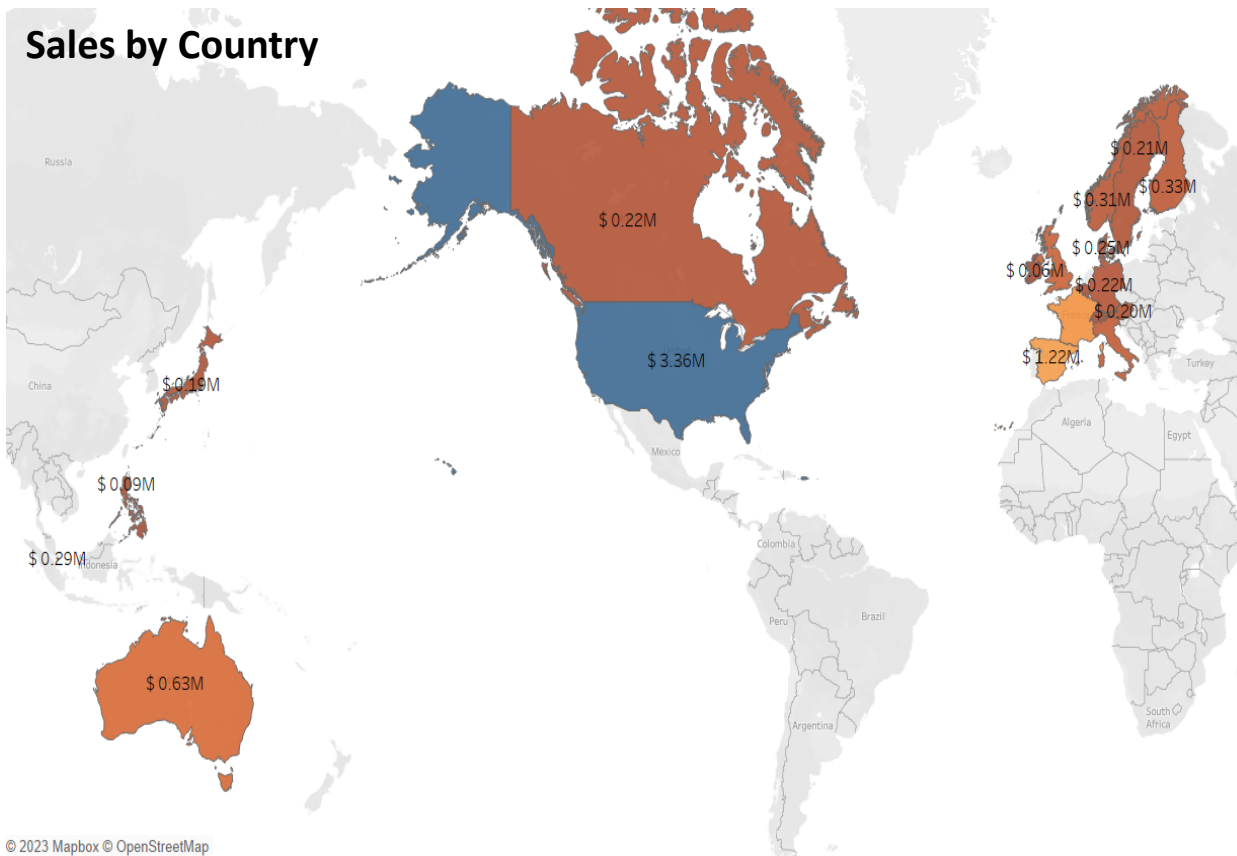
- USA has the highest sales with 34.38% share with $3.36M and Ireland has the least sales with $ 0.06M
- Euro Shopping Channel is customer with highest sales with $912K and and Boards & Co Toys has least sales with $9.13K
- Classic cars has the most sales with $3.84M and Trains has the least share of sales with only with $0.23M

Average Price of each Product Line

Average Price of each Product

Parts of Classic cars has the highest average Price with an average price of $115.2 and that of Train has the least average price of $84.11

Product S10_1949 has the highest average Price with an average price of $199.52 K of classic cars part and product S24_3969 has the lowest average Price with an average price of $45.34 K of Vintage car part

Orders by Country
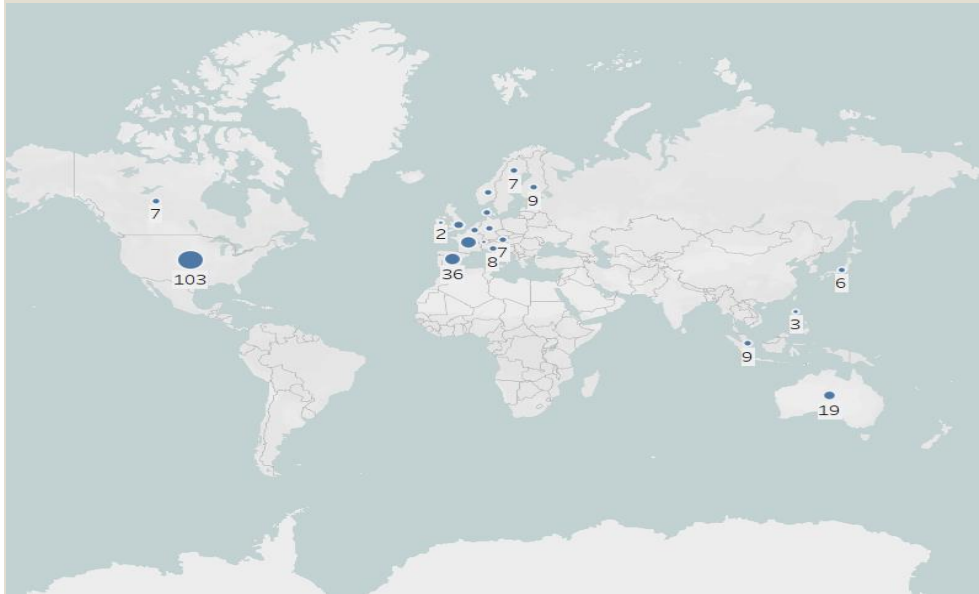
Number of Orders by Status

Number of Orders by Product Category

Number of Orders by Status (chart values): Shipped 277, In Process 6, Resolved 4, On Hold 4, Cancelled 4, Disputed 3

Number of Orders by Product Category (chart values): Classic Cars 193, Vintage Cars 169, Trucks and Buses 71, Motorcycles 70, Ships 63, Planes 58, Trains 45
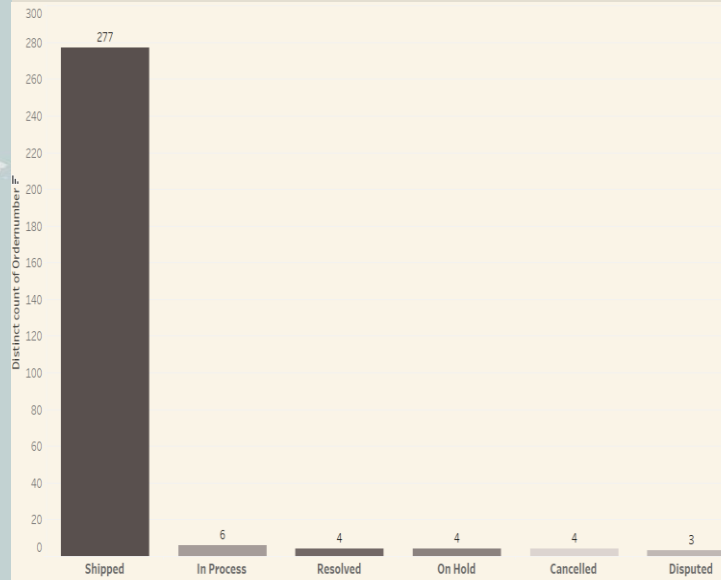
Number of Orders by Customers
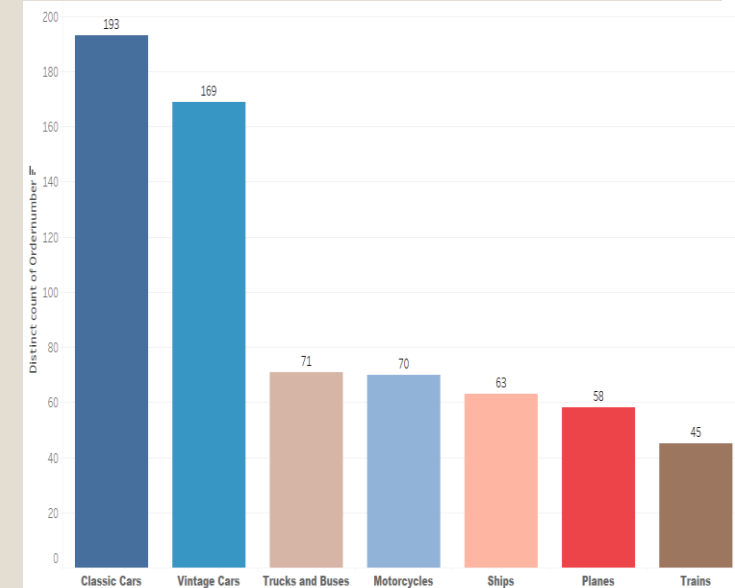
- USA has the maximum orders with 103 orders and Ireland and Switzerland has the least of 2 orders each.
- Customer Euro Shopping Channel has the maximum orders with 26 orders. Bavarian Collectible imports Co has just 1 order.
- Parts of Classic cars are present in 193 orders and Trains is present in just 45 out of 298 orders.
- 277 out of 299 Orders are in Shipped status , 6 in Process, 4 each in resolved, on-hold, cancelled status and 3 in disputed status

Country wise count of Product Line

Legend:
- Classic Cars
- Motorcycles
- Planes
- Ships
- Trains
- Trucks and Buses
- Vintage Cars
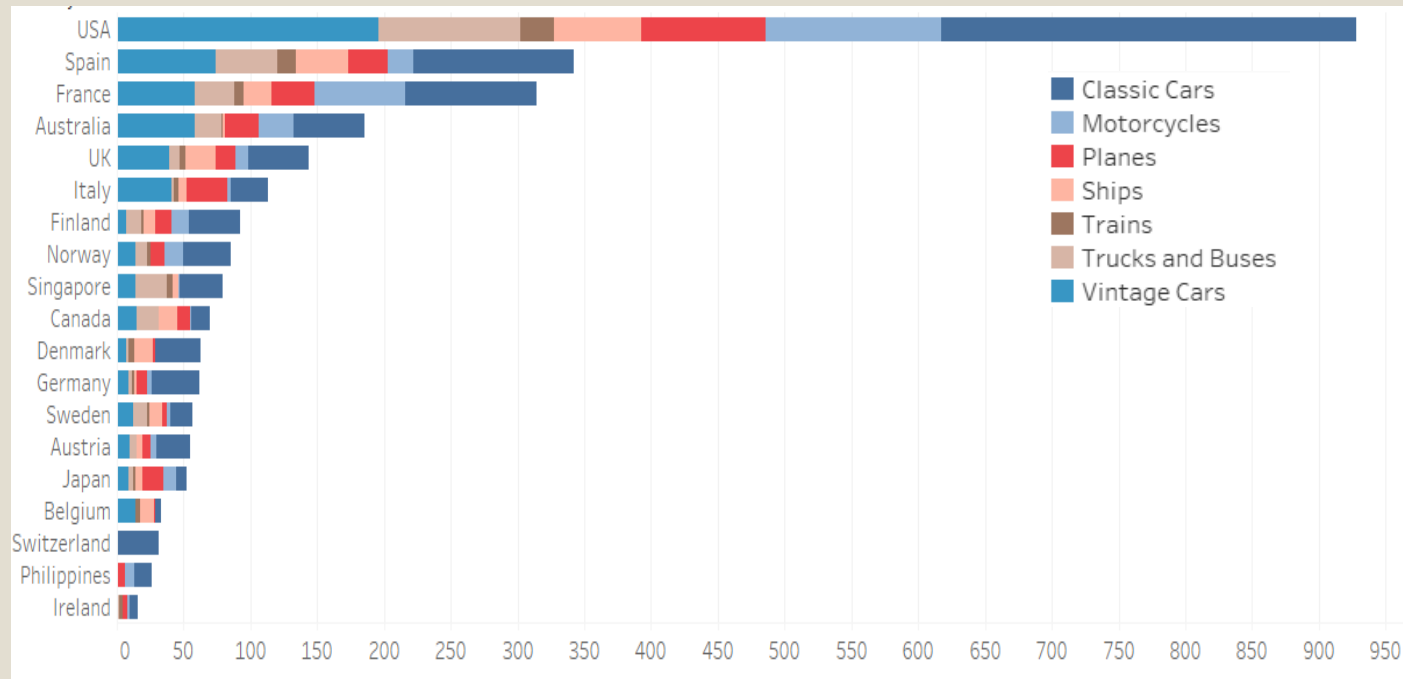
Status of each Product Line
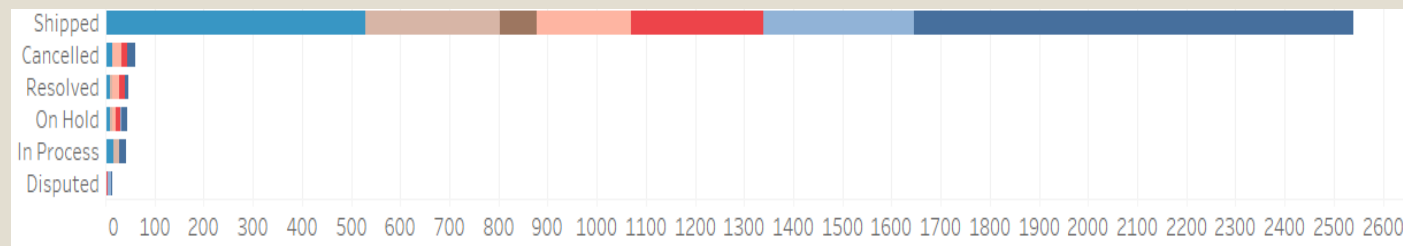
Deal Size Product Line
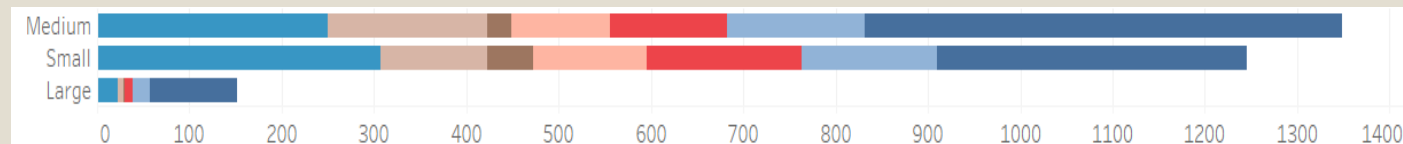
- USA has the maximum number of orders of which Classic cars parts were the most popular order followed by parts of Vintage cars ,Motorcycles, Trucks & Buses, Planes, Ships and lastly Trains

- Maximum orders are shipped status of which Classic cars parts are the most shipped orders followed by parts of Vintage cars ,Motorcycles, Trucks & Buses, Planes, Ships and lastly Trains.

- Maximum deals are of medium size of which of which Classic cars parts are the most ordered followed by parts of Vintage cars , Trucks & Buses, Motorcycles, Planes, Ships and lastly Trains.

Scatter Plot of Sales Vs Priceeach
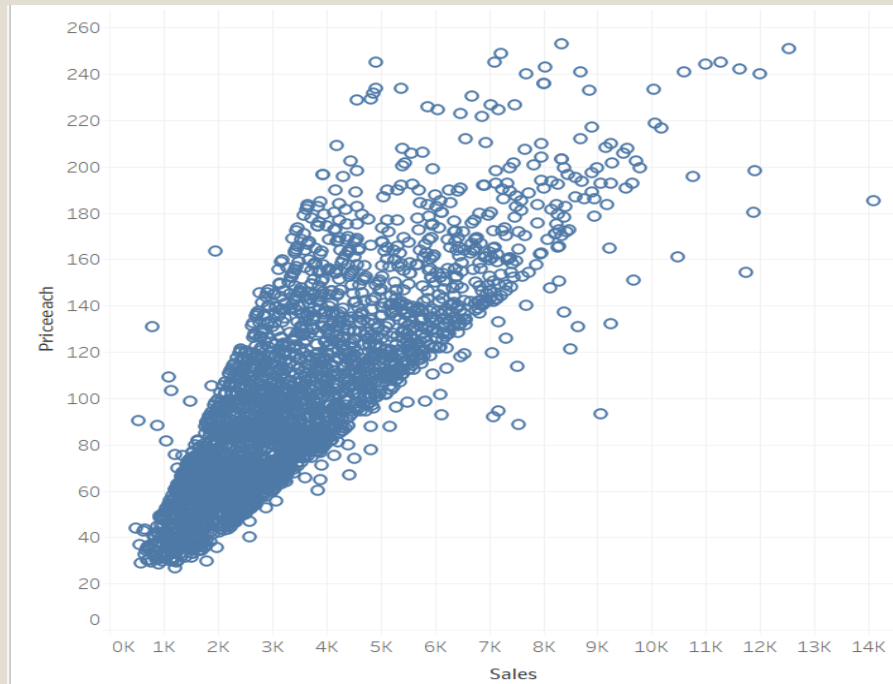
Scatter Plot of Sales Vs MSRP
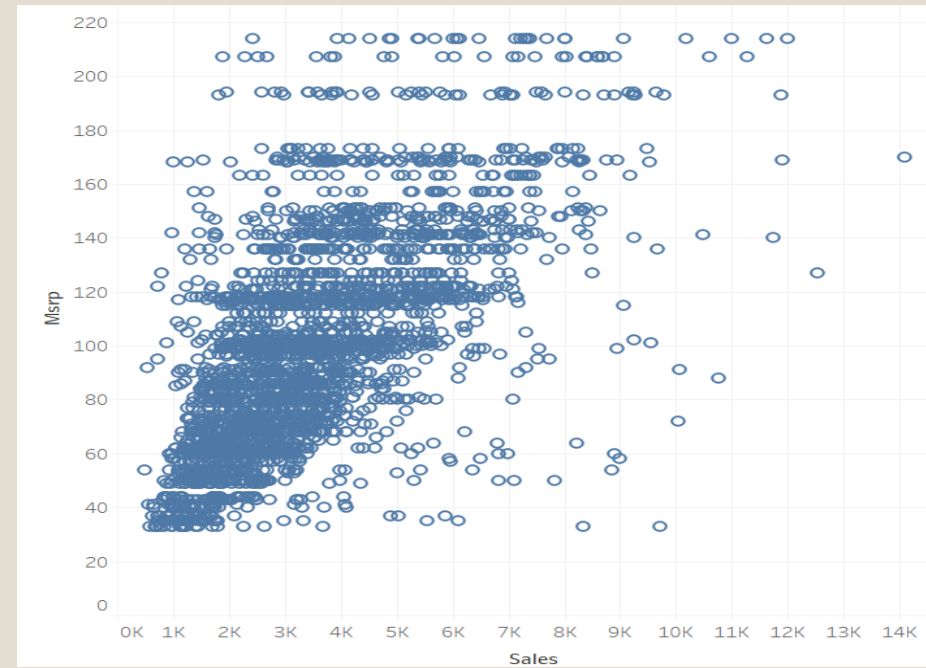
- Sales and Price   have a high correlation
- Sales and MSRP have a moderate correlation

Sales across different product lines
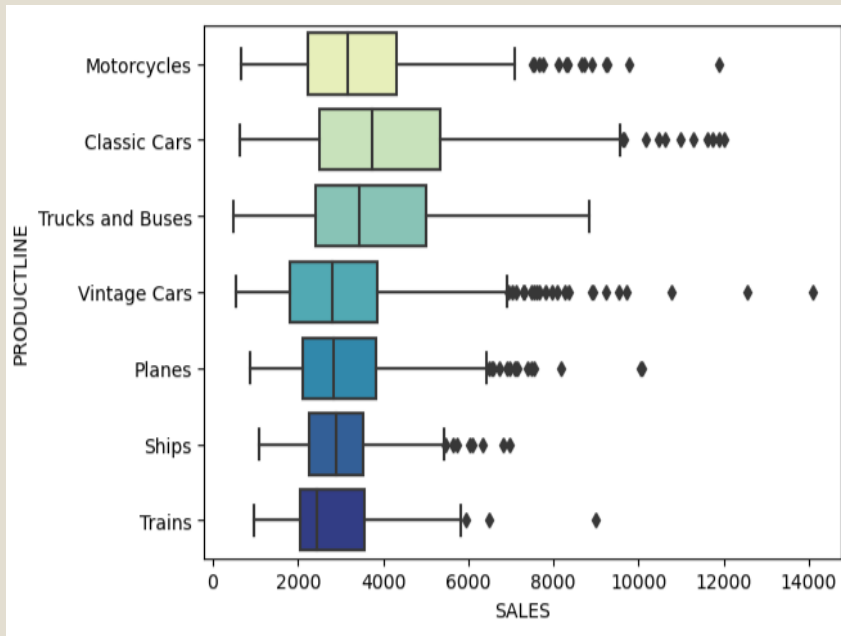
Sales across different status
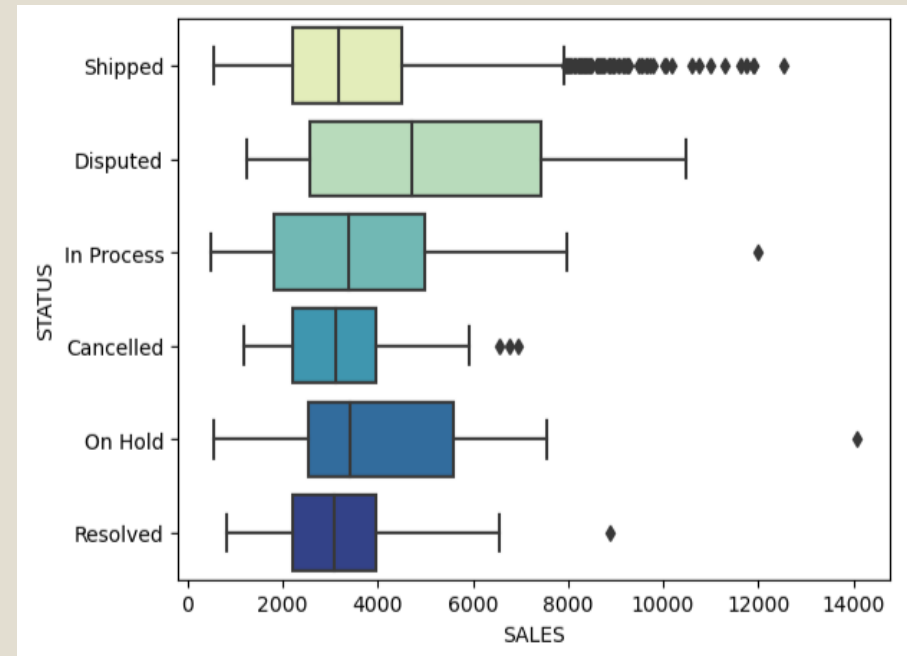
- There are outliers in sales amount in every product line except Trucks and Buses
- Orders in Classic Car has highest mean sales and Orders in Train has the lowest mean Sales
- Truck & Buses has the least Sale amount of all the Product categories . Vintage car has the highest sale price among all category
- There are outliers in every Status except Disputed
- Orders in Shipped status has many outliers in sales amount
- Orders in Disputed status has highest mean sales and Orders in Resolved status has the lowest mean Sales
- Orders in On-hold status has the maximum sale amount and Orders in In Process status has the least sale amount

Multi-variate Analysis

Country wise Product Sales

| Classic Cars USA $1.27M | Classic Cars France $0.39M | Classic Cars Australia $0.19M | Classic Cars UK $0.16M | Trucks and Buses USA $0.38M | Trucks and Buses Spain $0.18M | Motorcycles USA $0.46M |

Classic Cars Denmark $0.16M, Classic Cars, Classic Cars Italy, Trucks and Buses

Classic Cars Finland $0.15M, Trucks and Buses

Classic Cars Germany, Classic Cars Austria

Classic Cars Spain $0.48M, Classic Cars Norway, Classic Cars

Planes USA, Planes France, Planes

Planes Italy

Vintage Cars USA $0.66M, Vintage Cars Spain $0.23M, Vintage Cars France $0.18M, Planes

Vintage Cars Australia $0.19M, Vintage Cars UK, Ships USA $0.20M, Ships Spain $0.12M, Ships France

Vintage Cars Italy, Ships, Ships

Correlation heat map

MSRP Vs Price of Product Category
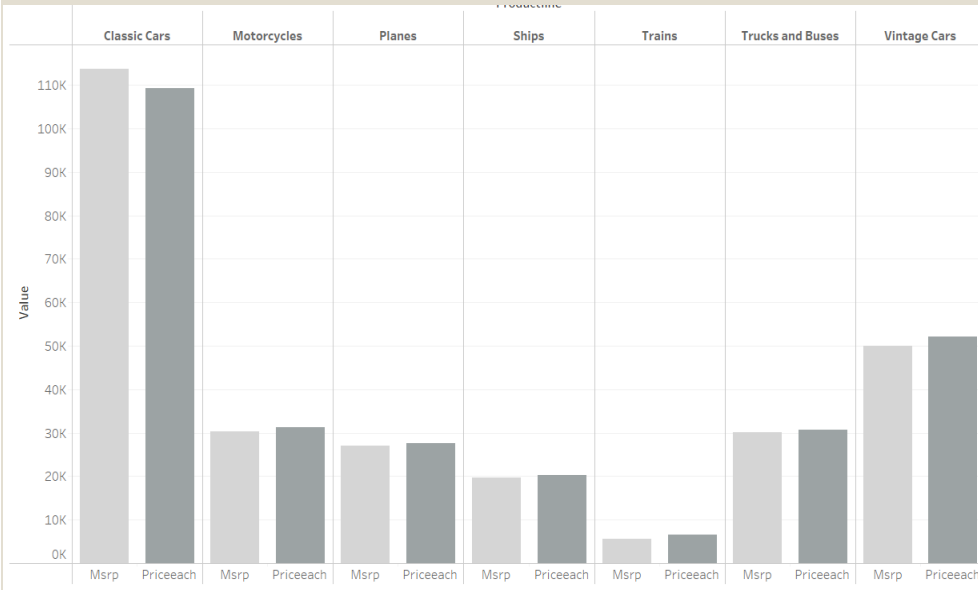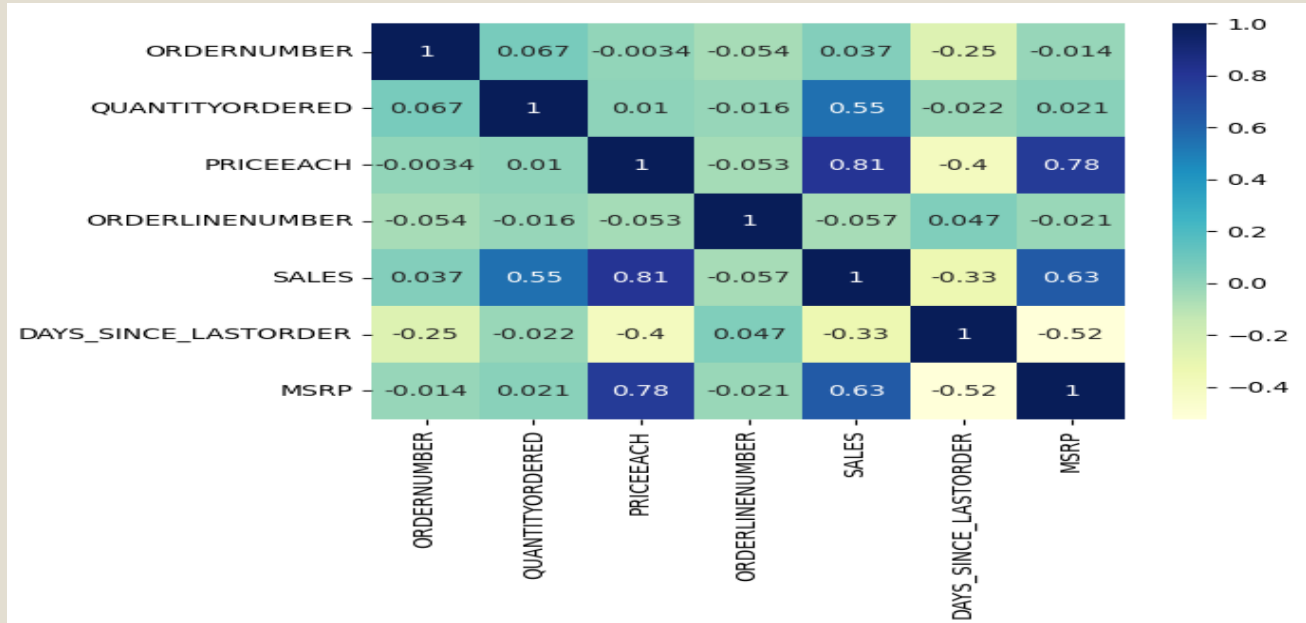
- Sales from parts of classic cars from customers in USA is the highest of all and Sales from parts of Trains from customers in Australia is the least of all
- Selling Price of Parts of Classic cars is less than MSRP , whereas for all other product categories Selling Price is more than MSRP, indicating that since Classic cars Parts is most sold , prices have been discounted .
- Among all the numerical variables Priceeach is highly correlated with MSRP and Sales and MSRP is moderately correlated with Sales. Sales is moderately correlated with quantity ordered

Yearly Analysis of Data

Orders and Sales across Years

Yearly Orders and Sales
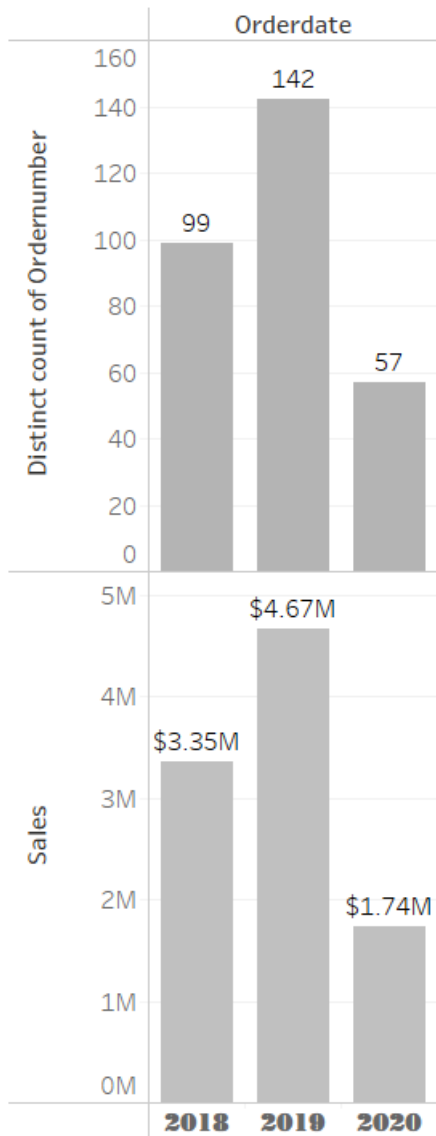
Orderdate

Country wise Sales across Years

Country	Orderdate 2018	2019	2020
Australia	$253.13K	$232.40K	$145.09K
Austria	$82.12K	$51.69K	$68.25K
Belgium	$3.35K	$80.02K	$25.04K
Canada	$54.61K	$135.78K	$33.69K
Denmark	$99.19K	$120.43K	$26.01K
Finland	$111.15K	$91.58K	$126.85K
France	$312.76K	$555.20K	$242.96K
Germany	$70.05K	$150.42K	
Ireland		$57.76K	
Italy	$140.93K	$192.24K	$41.51K
Japan		$149.42K	$38.75K
Norway	$196.53K	$110.93K	
Philippines	$78.09K	$15.93K	
Singapore	$165.69K	$116.04K	$6.76K
Spain	$405.34K	$483.55K	$326.80K
Sweden	$58.46K	$119.95K	$31.61K
Switzerland		$117.71K	
UK	$180.42K	$257.66K	$40.80K
USA	$1,141.18K	$1,631.23K	$583.16K

% Sales across all years per product line
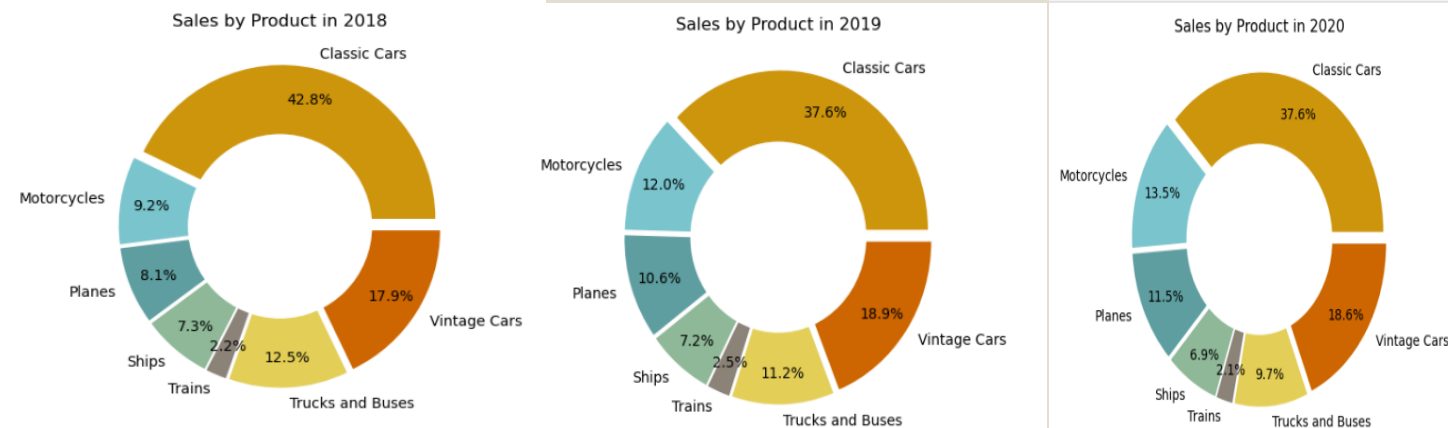
- Year 2019 has maximum orders on 142 and Year 2020 has the least orders of 57
- Year 2019 has maximum sales of $4.67M and Year 2020 has the least sales of $1.74M.
- Across All years Classic cars sales has been the highest and that of Trains the least
- USA had the highest sales among all countries , with Year 2019 having highest sales.
- Year on Year Sales has increased by 39.3% in year 2019 and reduced by 62.8% in year 2020

Percentage Change in Sales since 2018

2019	2020
39.3%	-62.8%

Quarterly Analysis of Data

Quarterly Sales across years

Year of Orderdate	Quarter ..
2018	Q1
	Q2
	Q3
	Q4
2019	Q1
	Q2
	Q3
	Q4
2020	Q1
	Q2
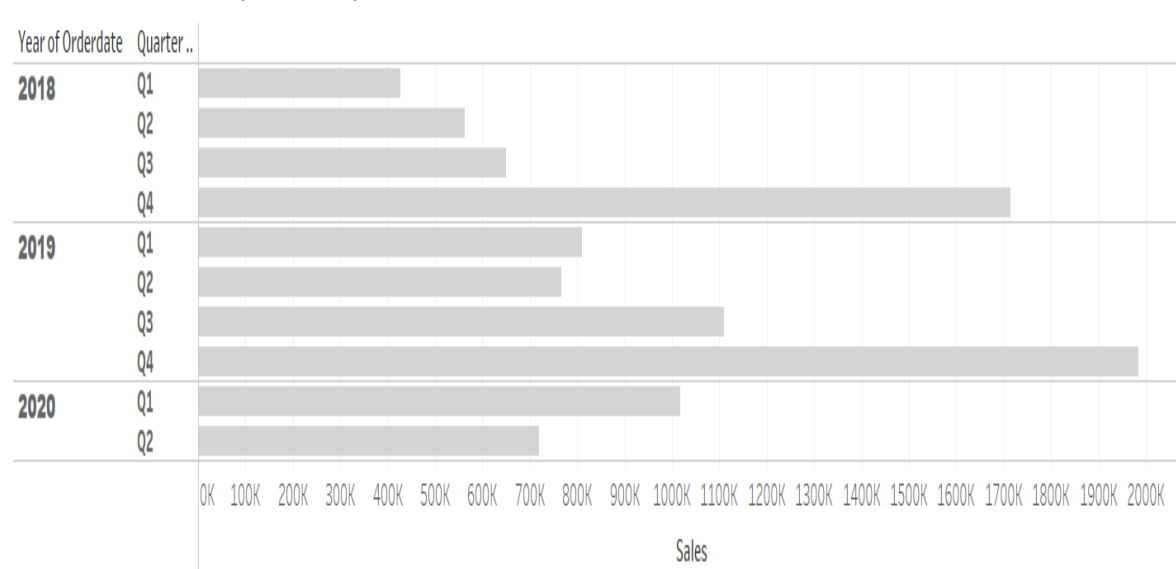
Sales

Quarterly Product Sales

- Classic Cars
- Motorcycles
- Planes
- Ships
- Trains
- Trucks and Buses
- Vintage Cars

Sales

Quarter of Orderdate
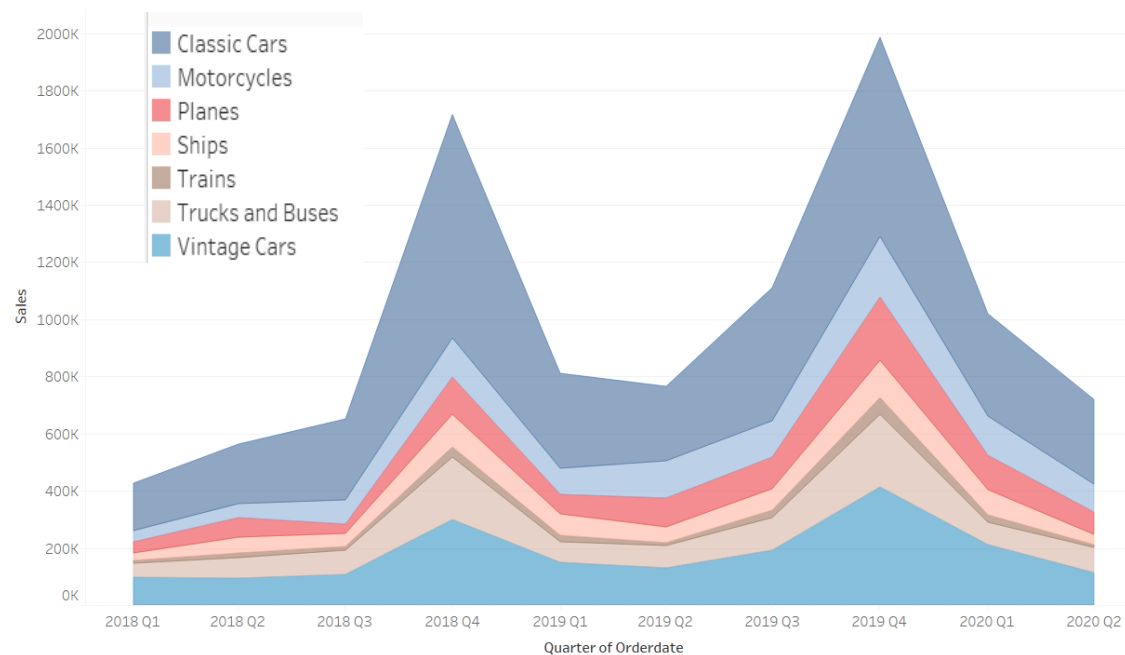
% change in sales across quarters

	2018				2019				2020	
Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
	31.9%	15.5%	164.0%	-52.8%	-5.4%	44.8%	78.9%	-48.7%	-29.3%

Quarterly Sales by Country
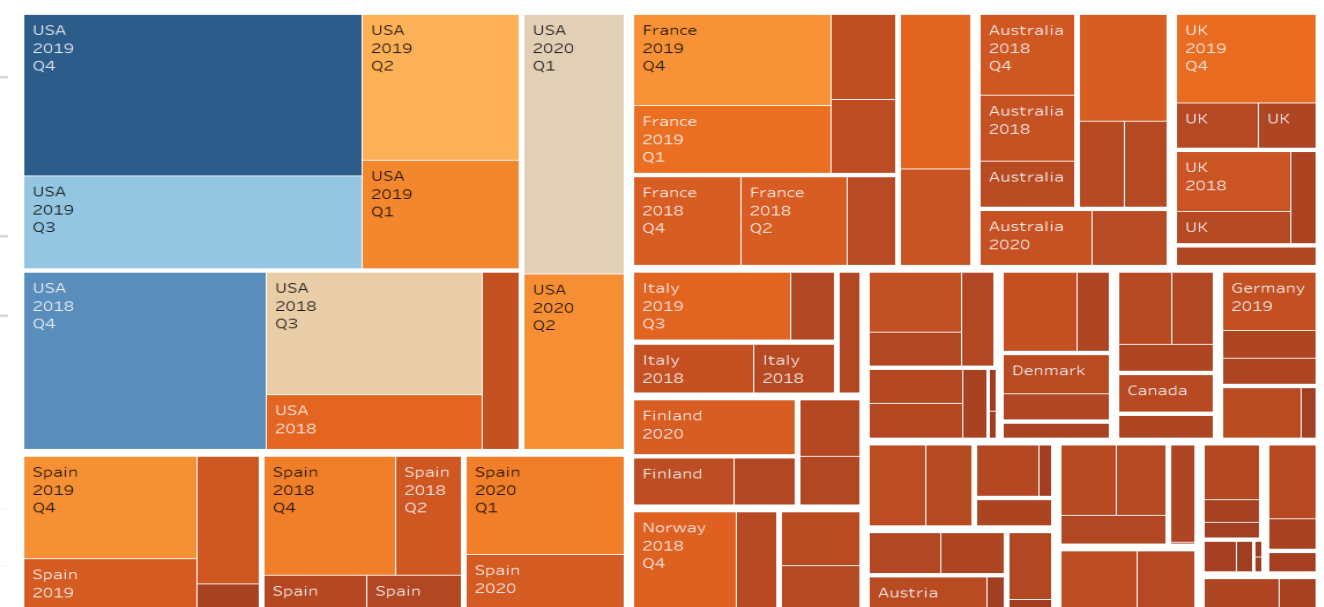
- Maximum sales was in the year 2019 in Quarter 4 and least sales was in Q1 of year 2018
- USA had the highest sales among all countries , with Year Quarter 4 in year 2019 having highest sales.
- Quarter on Quarter Sales was highest in Q4 of year 2018 with 164% increase in sales and least in Q1 of 2019 the sales dropped by 52.8%.
- Classic cars showed highest sales across all quarters
- Quarter 4 of 2018 and 2019 had highest sales in Classic cars

Monthly Analysis of Data

Monthly Sales across years

Country wise sales across Months
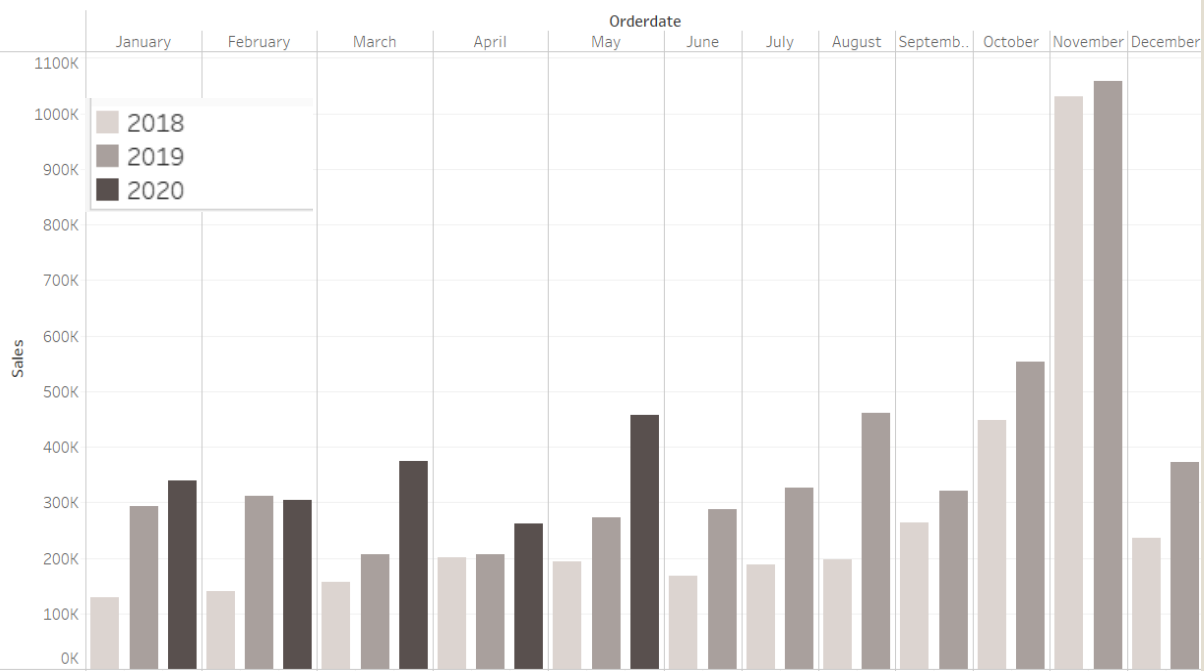
Monthly Sales by Product
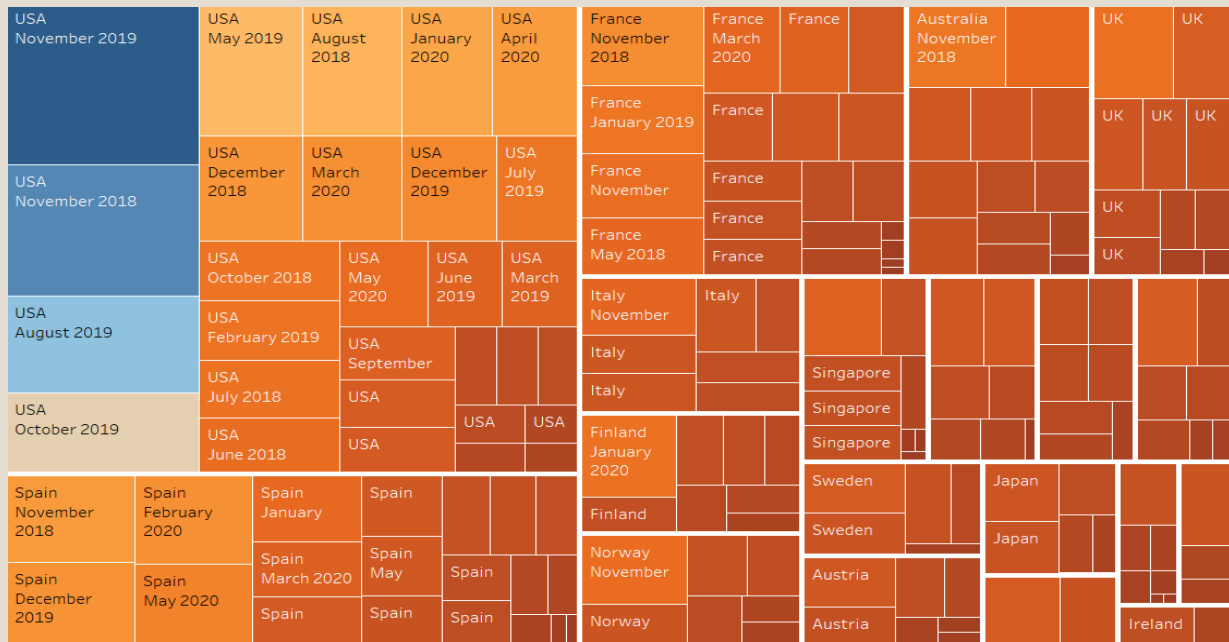
- There is monthly data only from January through May for year 2020 and for all months in year 2018 and 2019.
- November is the month with highest sales
- Monthly analysis of data reveals that November month of year 2018 and 2019 had highest sales and least sales was in the month January of year 2018
- November month of year 2018 and 2019 had highest sales for Classic cars and January of 2018 was least sales for Classic cars
- USA has maximum sales in the November month of 2019

Weekly Analysis of Data

Weekly sales across Years
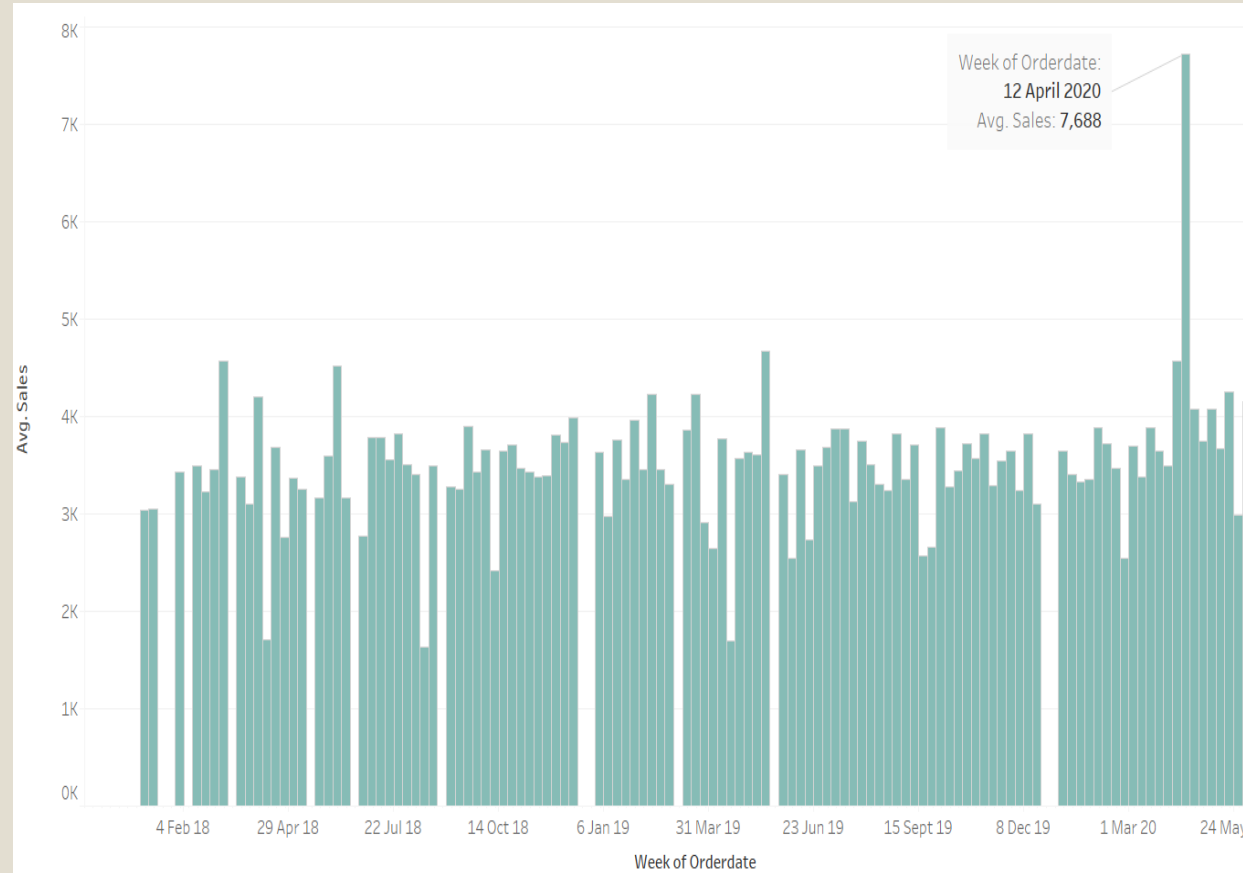
Weekly sales across Years per product
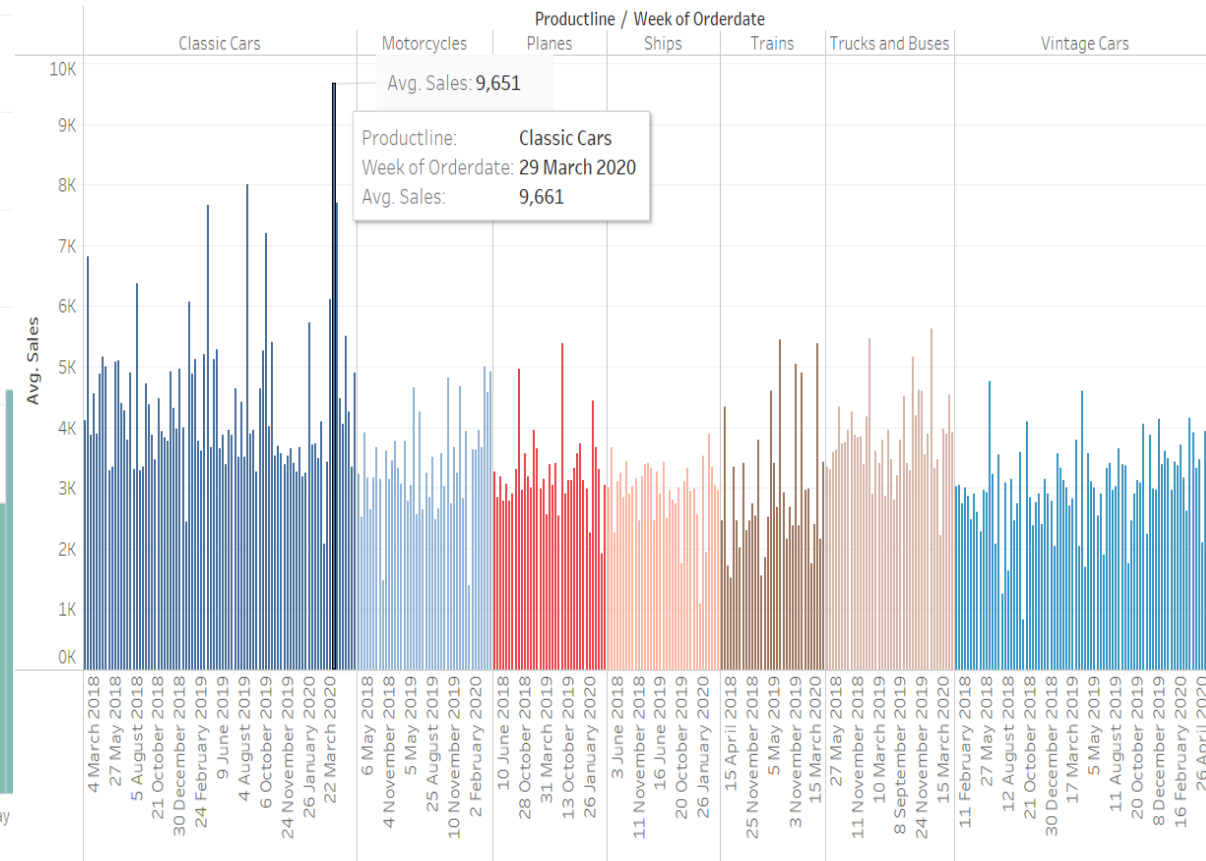
- There are weeks where there were no sales
- Average weekly sales was highest on the week of April 12 2020, avg sales was $7688
- Average weekly sales was highest for Classic cars In the week of 29 March 2020, avg sales was $9661

Changing Trends in Sales across Years, Months, Quarters and Weeks

Yearly

Sales values shown: 3,353,014 (2018), 4,669,925 (2019), 1,737,283 (2020)

X-axis: Year of Orderdate (2018, 2019, 2020)
Y-axis: Sales (0M to 4M)

Monthly

X-axis: Month of Orderdate (June 2018, December 2018, June 2019, December 2019, June 2020)
Y-axis: Sales (0K to 1000K)

Quarterly

X-axis: Quarter of Orderdate (2018 Q2, 2018 Q4, 2019 Q2, 2019 Q4, 2020 Q2)
Y-axis: Sales (0K to 2000K)

Weekly

X-axis: Week of Orderdate (13 May 18, 11 Nov 18, 12 May 19, 10 Nov 19, 10 May 20)
Y-axis: Sales (0K to 300K)

Inferences from EDA

◦ Parts for Classic cars have maximum sales and Trains have lowest sales.

◦ USA has maximum sales and Ireland has minimum sales.

◦ November month has highest sales across all years.

◦ Euro Shopping channel is the customers that have given maximum sales

◦ Deal-Size Medium has highest numbers

◦ Most of all the transactions are been shipped.Of the 60 cancelled orders , 18 of them of them are for ships, 16 for classic cars , 12 for planes, 13 for vintage cars and 1 for Train .

◦ Countries like Ireland, Germany, Norway have not ordered in year 2020

◦ As sales are high for classic cars the company has even sold below MSRP, there might be a chances that the company has given more discounts to its customers. Vintage cars, Ship, Motorcycles & trains are been sold above the MSRP.

Customer Segmentation using RFM analysis

The most important aspect of Analytics in Retail is to gain a very comprehensive understanding of the consumer .The key to understanding consumer behavior is through building different kinds of segments **.**

RFM is a segmentation technique that gives you a measure of the loyalty of the customer.

RFM stands for Recency, Frequency, and Monetary value, each corresponding to some key customer trait.

These RFM metrics are important indicators of a customer's behavior because frequency and monetary value affects a customer's lifetime value, and recency affects retention, a measure of engagement. Thus ,RFM Analysis will help the businesses to segment their customer base into different homogenous groups so that they can engage with each group with different targeted marketing strategies.

RFM factors illustrate these facts:

• The more recent the purchase, the more responsive the customer is to promotions.

• The more frequently the customer buys, the more engaged and satisfied they are.

• Monetary value differentiates heavy spenders from low-value purchasers.

RFM analysis helps us find answers to the following questions:

• Who are your best customers? Which of your customers could contribute to your churn rate? Who has the potential to become valuable customers? Which of your customers can be retained? Which of your customers are most likely to respond to engagement campaigns?

Parameters and Assumptions

We will be performing RFM analysis using KNIME , here are the assumptions and parameters needed for RFM analysis

Assumptions

- To arrive at Recency value , the reference date used is todays date hence not a fixed date

- Records with status cancelled are not considered for RFM analysis, because these orders are assumed to have not resulted in sales

- Since each customer has multiple orders, RFM is computed by grouping the customers and aggregating other parameters

- For our analysis we will not consider days since last order column, because its not calculated based on a certain base date

- To compute Monetary value, we will be using SALES values, as it same as Price * Quantity

- Frequency is taken as number of unique orders placed by customers and not total number of orders for that customer, because same order is having multiple line items

Parameters used in KNIME

◦ **Recency** is computed for each order for a customer using formula (todays_date- order_date) and then minimum of that value is considered as recency value for that customer

◦ **Frequency** for a customer is computed as count of unique order numbers , as the same customers can have multiple orders

◦ **Monetary** value for a customer is computed using formula quantity *price for each order and then summing up the monetary value for that customer . However since SALES column also does the same thing so Monetary parameter is equated to Sales

◦ To Bin the customers into segments, four different bins for Recency, frequency & Monetary are created using percentile range (0,0.10,0.40,0.70,100) which will be binned as Bin 1, Bin 2 , Bin 3 , Bin 4 based on percentile values .

◦ Monetary and Frequency will be assigned bins in ascending order of the percentile as Low, Medium, High and Churn whereas Recency will be assigned bins in descending order of the percentile as Low, Medium, High and Churn

◦ Customers are segmented into Best, Lost, Loyal and Churning Customers based on the combinations of the Low, medium, high and Churn .

KNIME Workflow Image
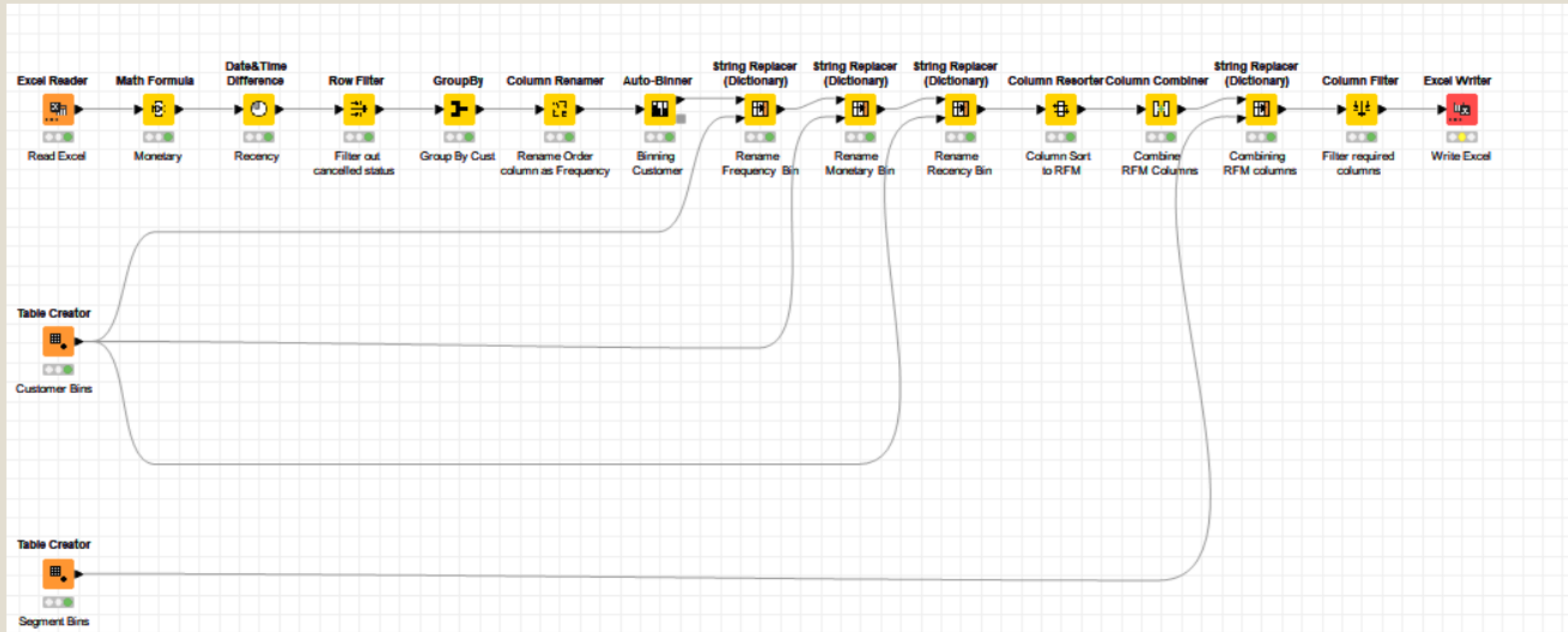
Output of RFM Analysis

Table "default" - Rows: 89 | Spec - Columns: 9 | Properties | Flow Variables

Row ID	▲ CUSTOMERNAME	Recency	Freque...	Monetary	Recenc...	Freque...	Moneta...	combin...	combi...
Row0	AV Stores, Co.	1427	3	157,807.81	L	L	H	LLH	Churning
Row1	Alpha Cognac	1295	3	70,488.44	M	L	L	MLL	Churning
Row2	Amica Models & Co.	1496	2	94,117.26	C	C	M	CCM	Churning
Row3	Anna's Decorations, Ltd	1314	4	153,996.13	M	M	H	MMH	Best
Row4	Atelier graphique	1419	3	24,179.96	L	L	C	LLC	Churning
Row5	Australian Collectables, Ltd	1253	3	64,591.46	H	L	L	HLL	Loyal
Row6	Australian Collectors, Co.	1415	5	200,995.41	L	H	H	LHH	Churning
Row7	Australian Gift Network, Co	1350	3	59,469.12	M	L	L	MLL	Churning
Row8	Auto Assoc. & Cie.	1464	2	64,834.32	L	C	L	LCL	Churning
Row9	Auto Canal Petit	1285	3	93,170.66	M	L	M	MLM	Loyal
Row10	Auto-Moto Classics Inc.	1411	3	26,479.26	L	L	C	LLC	Churning
Row11	Baane Mini Imports	1439	4	116,599.19	L	M	M	LMM	Loyal
Row12	Bavarian Collectables Imports, Co.	1490	1	34,993.92	C	C	C	CCC	Lost
Row13	Blauer See Auto, Co.	1439	4	85,171.59	L	M	M	LMM	Loyal
Row14	Boards & Toys Co.	1344	2	9,129.35	M	C	C	MCC	Churning
Row15	CAF Imports	1670	2	49,642.05	C	C	L	CCL	Lost
Row16	Cambridge Collectables Co.	1620	2	36,163.62	C	C	C	CCC	Lost
Row17	Canadian Gift Exchange Network	1453	2	75,238.92	L	C	L	LCL	Churning
Row18	Classic Gift Ideas, Inc	1461	2	67,506.97	L	C	L	LCL	Churning
Row19	Classic Legends Inc.	1423	3	77,795.2	L	L	L	LLL	Churning
Row20	Clover Collections, Co.	1489	2	57,756.43	L	C	L	LCL	Churning
Row21	Collectable Mini Designs Co.	1691	2	87,489.23	C	C	M	CCM	Churning
Row22	Collectables For Less Inc.	1363	3	81,577.98	M	L	M	MLM	Loyal
Row23	Corrida Auto Replicas, Ltd	1443	3	120,615.28	L	L	M	LLM	Churning
Row24	Cruz & Sons Co.	1428	3	94,015.73	L	L	M	LLM	Churning
Row25	Daedalus Designs Imports	1696	2	69,052.41	C	C	L	CCL	Lost
Row26	Danish Wholesale Imports	1277	5	145,041.6	M	H	H	MHH	Best
Row27	Diecast Classics Inc.	1232	4	122,138.14	H	M	H	HMH	Best
Row28	Diecast Collectables	1632	2	70,859.78	C	C	L	CCL	Lost
Row29	Double Decker Gift Stores, Ltd	1726	2	36,019.04	C	C	C	CCC	Lost
Row30	Dragon Souveniers, Ltd.	1321	5	172,989.68	M	H	H	MHH	Best
Row31	Enaco Distributors	1420	3	78,411.86	L	L	L	LLL	Churning
Row32	Euro Shopping Channel	1231	25	862,283.46	H	H	H	HHH	Best
Row33	FunGiftIdeas.com	1320	3	98,923.73	M	L	M	MLM	Loyal
Row34	Gift Depot Inc.	1257	3	101,894.79	M	L	M	MLM	Loyal
Row35	Gift Ideas Corp.	1410	3	57,294.42	L	L	L	LLL	Churning
Row36	Gifts4AllAges.com	1256	3	83,209.88	M	L	M	MLM	Loyal
Row37	Handji Gifts& Co	1269	4	115,498.73	M	M	M	MMM	Loyal
Row38	Heintze Collectables	1453	2	100,595.55	L	C	M	LCM	Churning
Row39	Herkku Gifts	1502	3	111,640.28	C	L	M	CLM	Churning
Row40	Iberia Gift Imports, Corp.	1469	2	54,723.62	L	C	L	LCL	Churning
Row41	L'ordine Souveniers	1252	3	142,601.33	H	L	H	HLH	Best
Row42	La Corne D'abondance, Co.	1424	3	97,203.68	L	L	M	LLM	Churning
Row43	La Rochelle Gifts	1231	4	180,124.9	H	M	H	HMH	Best
Row44	Land of Toys Inc.	1429	3	118,711.78	L	L	M	LLM	Churning

Customer Segments

Who are your best customers?

◦ On segmenting the customers based on Recency, frequency & monetary the list of out top performing customers is as below.

Some of the best customers are

Danish Wholesale Imports
Euro Shopping Channel
L'ordine Souveniers
La Rochelle Gifts
Mini Gifts Distributors Ltd.
Reims Collectables
Salzburg Collectables
Souveniers And Things Co.
The Sharp Gifts Warehouse

◦ These customers have high recency , high frequency and high spends. We have bucketed customers with low frequency value but with high recency and high frequency also as our best customers because they could potentially become our best customers .

◦ These customers have to rewarded. Offer personalized special discounts, early access, and other premium perks to make them feel valued and appreciated. They can become early adopters for new products and will help promote your brand.

◦ Euro Shopping Channel , Danish Wholesale Imports and Mini Gifts distributors are three of the best customers with high recency frequency and Spends

Customers who are on the verge of churning

◦ On segmenting the customers based on Recency, frequency & monetary the list of customers on the verge of churning are as below Some of the customers who are on the verge of churning are

AV Stores, Co.
Alpha Cognac
Amica Models & Co.
Atelier graphique
Australian Gift Network, Co
Auto-Moto Classics Inc.
Boards & Toys Co.
Classic Legends Inc.
Collectable Mini Designs Co.
Corrida Auto Replicas, Ltd
Cruz & Sons Co.
Enaco Distributors
Gift Ideas Corp.
Heintze Collectables
Herkku Gifts

◦ Customers are on the verge of churning are those customers who have a low to very low recency or with medium recency but with very low spends. These are your customers who purchased often and spent big amounts, but haven't purchased recently. Send them personalized reactivation campaigns to reconnect, and offer renewals and helpful products to encourage another purchase.

◦ We should focus on this group because they are on the verge of churning and can be lost.

◦ Some customers have high frequency and high good monetary value, but with very low recency. These customers could be turned in to loyal customers by enticing them with discounts or better offers

Customers whom we lost

◦ On segmenting the customers based on Recency, frequency & monetary the list of some customers whom we lost are as below

◦
Bavarian Collectables Imports, Co.
CAF Imports
Cambridge Collectables Co.
Double Decker Gift Stores, Ltd
Online Mini Collectables
Osaka Souveniers Co.
Signal Collectibles Ltd.

◦ Customers whom we lost are those customers who have a very low recency and their frequency and spend also is medium to low .For e.g. Bavarian Collectables Imports, Co. has very low recency, frequency and very low spend, so this customer is a lost customer

Customers who are loyal

○ On segmenting the customers based on Recency, frequency & monetary the list of customers whom are loyal are as below

Australian Collectables, Ltd
Australian Collectors, Co.
Auto Canal Petit
Baane Mini Imports
Blauer See Auto, Co.
Collectables For Less Inc.
FunGiftIdeas.com
Gift Depot Inc.
Gifts4AllAges.com
Mini Caravy
Mini Creations Ltd.
Muscle Machine Inc
Oulu Toy Supplies, Inc.
Petit Auto
Royale Belge
Scandinavian Gift Ideas
Technics Stores Inc.
Tekni Collectables Inc.
Toys of Finland, Co.
Toys4GrownUps.com
UK Collectables, Ltd.

○ These customers are those with high recency , hence new but may or may not have made big ticket purchases, but could potentially turn into best customers.

○ They could also be with medium recency , but with medium to high spends. These customers could be potential best customers .

○ Potential Loyalists are your recent customers with average frequency and who spent a good amount. Offer membership or loyalty programs or recommend related products to upsell them and help them become your Loyalists or Champions

Inferences from RFM Analysis

- Using Recency, frequency & monetary parameters we have grouped our Customers into Top, loyal, on the verge of churning and lost customers.

- Of the 89 customers we have only 14 best customers, 21 loyal, 35 on verge of churning and 19 lost customers.

- There are 35 who are churning, they are your customers who purchased often and spent big amounts, but haven't purchased recently there is a risk we might lose them if we don't take immediate actions.

- We have 14 customers who are the Champions and your best customers, who bought most recently, most often, and are heavy spenders.

- We have 21 loyal customers. They have medium recency, frequency and Monetary. They could also be potential loyalists are your recent customers with average frequency and who spent a good amount. It also includes New Customers who are customers who have a high overall RFM score but are not frequent shoppers.

- Our Top customer are either buying Classic Cars or Motorcycles. Their average spend is about 233K.

- Our Loyal customers average spend is about 100 K