



MRA PROJECT ML 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.

The columns in the dataset are - **ORDERNUMBER, QUANTITYORDERED, PRICEEACH, ORDERLINENUMBER, SALES, ORDERDATE, DAYS_SINCE_LASTORDER, STATUS, PRODUCTLINE, MSRP, PRODUCTCODE, CUSTOMERNAME, PHONE, ADDRESSLINE1, CITY, POSTALCODE, COUNTRY, CONTACTLASTNAME, CONTACTFIRSTNAME, DEALSIZE.**

Following is a snapshot of how data looks like :-

ORDERNUMBER	QUANTITYORDERED	PRICEEACH	ORDERLINENUMBER	SALES	ORDERDATE	DAYS_SINCE_LASTORDER	STATUS	PRODUCTLINE	MSRP	PRODUCTCODE	CUSTOMERNAME	PHONE	ADDRESSLINE1	CITY	POSTALCODE	COUNTRY	CONTACTLASTNAME	CONTACTFIRSTNAME	DEALSIZE
10107	30	95.70	2	2871	24-02-18	638	Shipped	Motorcycles	95.510_3678	720557818	Land of Togs Inc.	202557818	897 Long Airport Avenue	NVC	76022	USA	Vu	Kwai	Small
10121	34	31.35	5	27853	07-05-18	757	Shipped	Motorcycles	95.510_3678	720557818	Piem's Collectables	28.47855	53 rue de l'Abbaye	Paris	76100	France	Henriot	Paul	Small
10134	41	34.74	2	2684.24	19-07-18	703	Shipped	Motorcycles	95.510_3678	720557818	Ligon Souvenirs	+33 146 62 7555	27 rue du Colonel Pierre Aua	Paris	75003	France	Da Cunha	Daniel	Medium
10145	45	83.28	6	2742.7	25-08-18	643	Shipped	Motorcycles	95.510_3678	720557818	Tops4GrownUps.com	720557818	7834 Hillside Dr.	Pasadena	91003	USA	Young	Julie	Medium
10188	36	92.66	6	2473.76	28-06-18	596	Shipped	Motorcycles	95.510_3678	720557818	Technica Stores Inc.	509555609	9408 Firth Circle	Burlington	54207	USA	Hirano	Jari	Medium
10190	23	16.53	9	2497.77	18-10-18	573	Shipped	Motorcycles	95.510_3678	720557818	Dandelu Design Imports	20.3.855	84, chaussee de Journal	Lille	59000	France	Fiance	Marine	Small
10188	48	16.94	1	5932.22	18-11-18	587	Shipped	Motorcycles	95.510_3678	720557818	Henku Gifts	+47 2267 1225	Drammen 51 PØI 744 Sentrum	Bergen	115004	Norway	Ostian	Vegsel	Medium
10211	41	16.94	10	4708.44	15-01-19	592	Shipped	Motorcycles	95.510_3678	720557818	Auto Casualty	(14 155 8555	25 rue Laidston	Paris	75016	France	Pentier	Domique	Medium
10223	37	107.18	1	3965.66	20-02-19	475	Shipped	Motorcycles	95.510_3678	720557818	Australian Collectors, Co.	03 9520 4955	636 St Kilda Road	Melbourne	3004	Australia	Ferguson	Peter	Medium
10237	23	101.44	7	2333.12	05-04-19	432	Shipped	Motorcycles	95.510_3678	720557818	Visacrome Inc.	202557818	2578 Kingston Rd.	NVC	76022	USA	Frick	Michael	Small
10251	28	103.86	2	2888.64	16-05-19	298	Shipped	Motorcycles	95.510_3678	720557818	Tate's Collectables Inc.	202557818	1476 Moss Rd.	Newark	74109	USA	Brown	William	Medium
10263	24	169.14	2	2676.76	28-06-19	350	Shipped	Motorcycles	95.510_3678	720557818	Gilt Depot Inc.	202557818	25930 South Bay Ln.	Bridgewater	07962	USA	King	Julie	Medium
10275	45	82.83	1	4177.35	23-07-19	326	Shipped	Motorcycles	95.510_3678	720557818	La Rochelle Gifts	40.67855	67, rue des Cinquante Orages	Names	74000	France	Labrousse	Janine	Medium
10285	36	103.86	6	4089.60	27-08-19	292	Shipped	Motorcycles	95.510_3678	720557818	Maria's Replicas Co.	720557818	25322 Spinnaker Dr.	Cambridge	02147	USA	Hernandez	Marta	Medium
10298	23	102.93	9	2587.29	30-09-19	259	Shipped	Motorcycles	95.510_3678	720557818	Tops of Finland Co.	80 224 8555	Helsinkilä 45	Helsinki	0240	Finland	Karttunen	Matti	Small
10303	41	107.18	6	4394.38	05-10-19	245	Shipped	Motorcycles	95.510_3678	720557818	Baane Mini Imports	07-98 9555	Erling Skakkes gate 70	Stavenn	410	Norway	Bergulfsen	Jonas	Medium
10316	46	14.74	1	4359.04	02-11-19	223	Shipped	Motorcycles	95.510_3678	720557818	Dearest Classics Inc.	2025555955	7368 Pompton St.	Albionton	07027	USA	Vu	Kwai	Medium
10329	42	104.67	1	4396.14	15-11-19	286	Shipped	Motorcycles	95.510_3678	720557818	Land of Togs Inc.	720557818	897 Long Airport Avenue	NVC	76022	USA	Vu	Kwai	Medium
10341	41	169.73	9	7737.93	24-11-19	208	Shipped	Motorcycles	95.510_3678	720557818	Saltburg Collectables	0562 4955	Giesweg 11	Saltburg	70129	Austria	Pippos	Georg	Large
10361	20	22.95	10	1481	17-12-19	186	Shipped	Motorcycles	95.510_3678	720557818	Souveniers And Things Co.	412 9495 9555	Monitor Money Building, 885 Pacific Hwy	Chatswood	15067	Australia	Huey	Adrian	Small
10375	21	34.39	12	733.11	03-02-20	159	Shipped	Motorcycles	95.510_3678	720557818	La Rochelle Gifts	40.67855	67, rue des Cinquante Orages	Names	74000	France	Labrousse	Janine	Small
10388	42	76.36	4	3207.12	03-03-20	11	Shipped	Motorcycles	95.510_3678	720557818	FunGiftIdeas.com	709552055	1705 First Street	New Bedford	01953	USA	Bentzen	Victoria	Medium
10403	24	161.44	7	2434.56	08-04-20	78	Shipped	Motorcycles	95.510_3678	720557818	UK Collectables Ltd.	(171) 655 2352	Bewley Gardens 12 Boreway	Liverpool	L10 1LT	UK	Devon	Elizabeth	Small
10417	66	103.86	2	7598.08	13-05-20	42	Disputed	Motorcycles	95.510_3678	720557818	Euro Shopping Channel	(91) 555 94 44	C/ Morabazcal, 86	Madrid	28014	Spain	Freyre	Diego	Large
10403	28	207.87	11	5404.62	29-01-18	878	Shipped	Classic Cars	214_510_1943	720557818	Baane Mini Imports	07-98 9555	Erling Skakkes gate 70	Stavenn	410	Norway	Bergulfsen	Jonas	Medium
10412	29	245.85	11	7208.11	24-03-18	828	Shipped	Classic Cars	214_510_1943	720557818	Yooni Model Replicas Co.	08212 2855	Bergengren 8	Lule	S-458 12	Sweden	Berglund	Christina	Large
10426	38	192.87	11	7323.08	28-05-18	761	Shipped	Classic Cars	214_510_1943	720557818	Conida Auto Replicas Ltd.	(91) 555 22 82	C/ Alayga, 67	Madrid	28023	Spain	Sommer	Martin	Large
10440	37	193.30	11	7274.1	24-07-18	705	Shipped	Classic Cars	214_510_1943	720557818	Technica Stores Inc.	509555609	9408 Firth Circle	Burlington	54207	USA	Hirano	Jari	Large
10450	45	244.26	9	10933.35	19-09-18	640	Shipped	Classic Cars	214_510_1943	720557818	Dragon Souvenirs Ltd.	+45 221 7855	Bronn Søk, Bronx Apt. 316 Vestvige	Singapore	76903	Singapore	Rajendran	Eric	Large
10463	21	231.44	1	4860.24	20-10-18	619	Shipped	Classic Cars	214_510_1943	720557818	Classic Legends Inc.	5905 Pompton St.	NVC	76022	USA	Hernandez	Maria	Medium	
10474	34	235.73	4	8014.82	06-11-18	603	Shipped	Classic Cars	214_510_1943	720557818	Australian Gift Network, Co.	61 2344 4955	31 Duncan St. West End	South Brisbane	4101	Australia	Calaghan	Tony	Large
10483	23	103.59	9	5373.57	15-11-18	597	Shipped	Classic Cars	214_510_1943	720557818	Classic Gift Ideas, Inc.	720557818	712 First Street	Philadelphia	19120	USA	Cavanese	Francisco	Medium
10494	42	173.58	11	7230.36	25-11-18	586	Shipped	Classic Cars	214_510_1943	720557818	Sawley's Henriot, Co.	78 32 5555	2, rue du Commerce	Lyon	69004	France	Savoyet	Mary	Large
10506	47	162.87	6	9604.89	05-12-18	577	Shipped	Classic Cars	214_510_1943	720557818	Canadian Gift Exchange Network	(804) 555 2352	1900 Oak St.	Vancouver	V2F 3K3	Canada	Tannamari	Yoshii	Large
10515	35	172.58	9	6075.3	23-01-19	623	Shipped	Classic Cars	214_510_1943	720557818	Vest Coast Collectables Co.	709557818	3478 Firth Circle	Burlington	54208	USA	Thompson	Steve	Medium
10528	29	222.87	2	6463.23	10-03-19	484	Shipped	Classic Cars	214_510_1943	720557818	Cambridge Collectables Co.	707555555	4658 Baden Av.	Cambridge	02147	USA	Tseng	Kyung	Medium
10545	34	160.81	9	6320.34	04-05-19	430	Shipped	Classic Cars	214_510_1943	720557818	Super Scale Inc.	2025555945	567 North Pendale Street	New Haven	07023	USA	Leffle	Kenneth	Medium
10556	32	260.02	6	7681.64	15-06-19	395	Shipped	Classic Cars	214_510_1943	720557818	Tolpog Collectables Ltd.	412 9495 9555	2, rue du Commerce	Lyon	69004	France	Savoyet	Mary	Large
10570	21	233.59	9	4905.39	19-07-19	356	Shipped	Classic Cars	214_510_1943	720557818	Souveniers And Things Co.	412 9495 9555	Monitor Money Building, 885 Pacific Hwy	Chatswood	15067	Australia	Huey	Adrian	Medium
10580	34	235.73	2	8014.82	17-08-19	328	Shipped	Classic Cars	214_510_1943	720557818	Amica Models & Co.	089 34 4955	Via Monte Bianco 34	Torino	10100	Italy	Accorti	Paolo	Large
10595	307	182.87	11	718.19	09-09-19	307	Shipped	Classic Cars	214_510_1943	720557818	Scandinavian Gift Ideas	089 34 4955	Thungsten 34	Borås	S-444 67	Sweden	Larsson	Maria	Large
10604	47	26.44	6	1072.7	11-10-19	275	Shipped	Classic Cars	214_510_1943	720557818	Auto Assoc. & Cie	30.53 8555	67, avenue de l'Europe	Verailles	77000	France	Tonini	Daniel	Large
10612	48	242.36	3	1023.7	23-10-19	264	Shipped	Classic Cars	214_510_1943	720557818	Mini Gift Distributors Ltd.	749550490	5677 Strong St.	San Rafael	91962	USA	Nelson	Valerie	Large
10622	40	160.81	1	6000.47	04-11-19	251	Shipped	Classic Cars	214_510_1943	720557818	Deleu Deleu Creations Co.	202557818	2384 Long Airport Avenue	NVC	76022	USA	Yalanie	Valerie	Medium
10647	30	103.49	1	3944.7	23-11-19	229	Shipped	Classic Cars	214_510_1943	720557818	Australian Collectors, Co.	03 9520 4955	636 St Kilda Road	Melbourne	3004	Australia	Ferguson	Peter	Medium
10657	32	177.87	10	5631.94	10-12-19	219	Shipped	Classic Cars	214_510_1943	720557818	Mini Gift Distributors Ltd.	749550490	5677 Strong St.	San Rafael	91962	USA	Nelson	Valerie	Medium

ABOUT DATA

The data is the given dataset is based on the information collected in the past 3 years. It has 20 columns and around 2750 line items about different customers, products, their last visits, orders, status of their orders, geographical data, deal size, etc.

The data has no missing values but still needs some computation to make it meaningful and derive some insights. So, we need to do some analysis , EDA, visualizations and perform RFM to derive the insights regarding the behavior of customer and their relationship with the manufacturing company.

EDA

INFORMATION WRT NON-NULL VALUES, DATA TYPES AND COLUMN NAMES USING **INFO()**

```
<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
```

SIZE OF DATA, NULL VALUES IN ALL COLUMNS, 5-NUMBER SUMMARY OF NUMERICAL DATA
USING **SHAPE, ISNA().SUM() AND DESCRIBE()** RESPECTIVELY

```
Number of rows- 2747
Number of columns- 20
ORDERNUMBER      0
QUANTITYORDERED  0
PRICEEACH        0
ORDERLINENUMBER  0
SALES            0
ORDERDATE        0
DAYS_SINCE_LASTORDER  0
STATUS           0
PRODUCTLINE      0
MSRP             0
PRODUCTCODE      0
CUSTOMERNAME     0
PHONE            0
ADDRESSLINE1     0
CITY             0
POSTALCODE       0
COUNTRY          0
CONTACTLASTNAME  0
CONTACTFIRSTNAME 0
DEALSIZE         0
dtype: int64
```

	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

DESCRIPTION OF CATEGORICAL DATA-

NUMBER OF UNIQUE VALUE, DIFFERENT VALUES AND ITS OCCURRENCES USING **NUNIQUE()** , **VALUE_COUNTS()** AND SORTING BY **SORT_VALUES()**

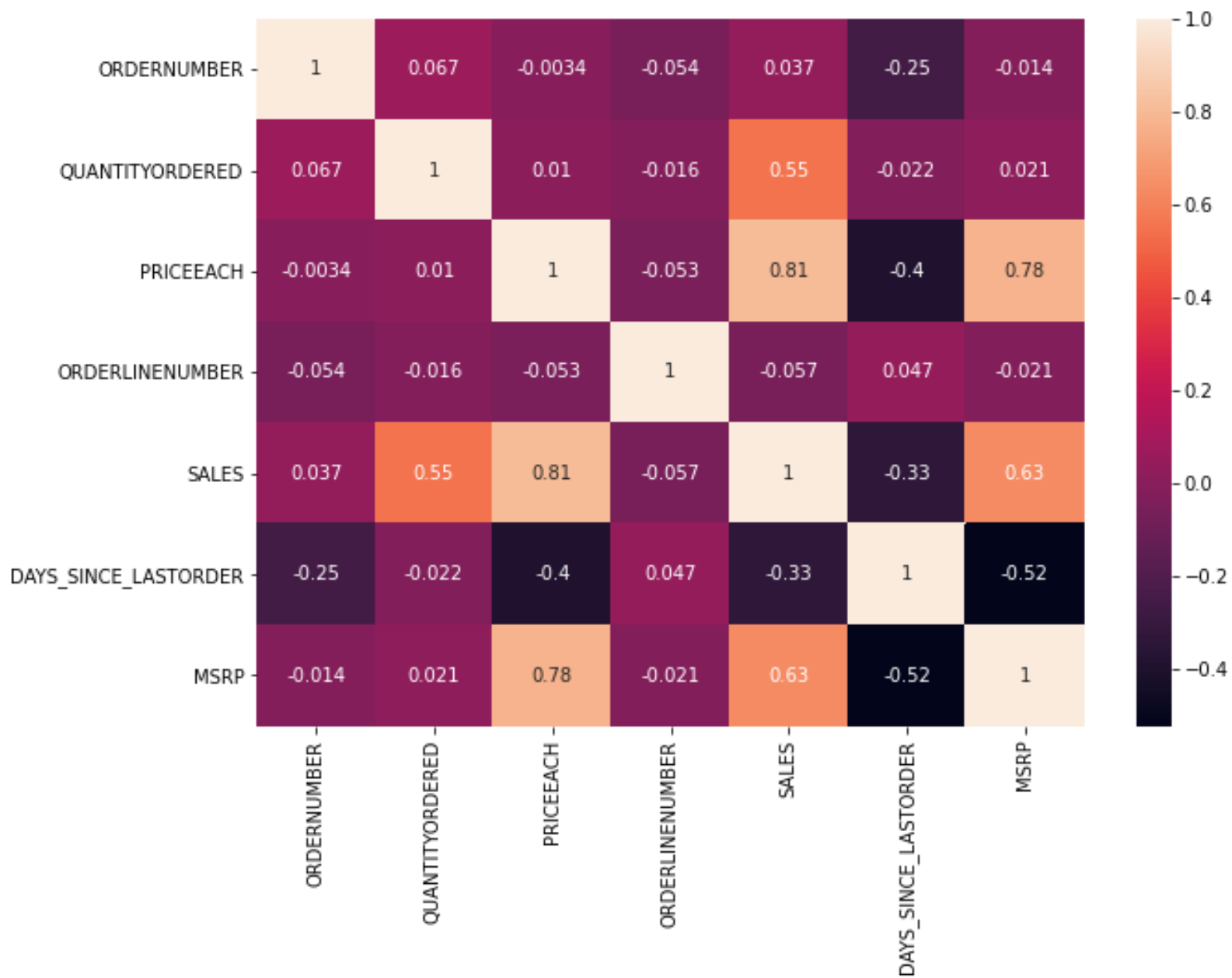
```
STATUS : 6
Disputed      14
In Process    41
On Hold       44
Resolved      47
Cancelled     60
Shipped      2541
Name: STATUS, dtype: int64
```

```
PRODUCTLINE : 7
Trains        77
Ships         230
Trucks and Buses 295
Planes        304
Motorcycles   313
Vintage Cars  579
Classic Cars  949
Name: PRODUCTLINE, dtype: int64
```

```
CITY : 71
Charleroi     8
Burbank       13
Munich        14
Sevilla       15
Brisbane      15
...
Paris         70
Singapore     79
NYC           152
San Rafael    180
Madrid        304
Name: CITY, Length: 71, dtype: int64
```

```
COUNTRY : 19
Ireland       16
Philippines   26
Switzerland   31
Belgium       33
Japan         52
Austria       55
Sweden        57
Germany       62
Denmark       63
Canada        70
Singapore     79
Norway        85
Finland       92
Italy         113
UK            144
Australia     185
France        314
Spain         342
USA           928
Name: COUNTRY, dtype: int64
```

```
DEALSIZE : 3
Large      152
Small     1246
Medium    1349
Name: DEALSIZE, dtype: int64
```



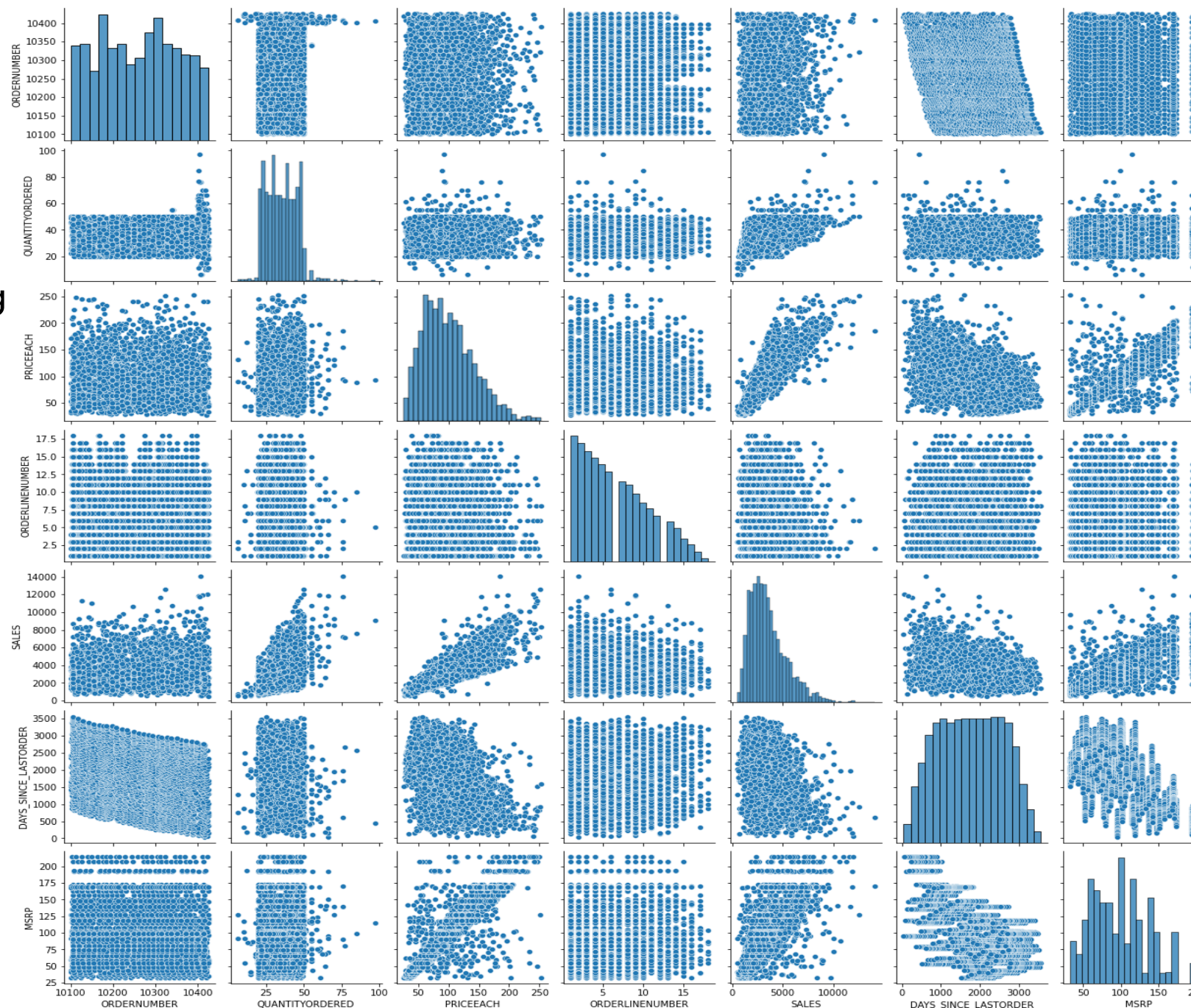
Using **corr()** and seaborn library
for plotting **heatmap()**

CORRELATION AND HEATMAPS

PAIRPLOT

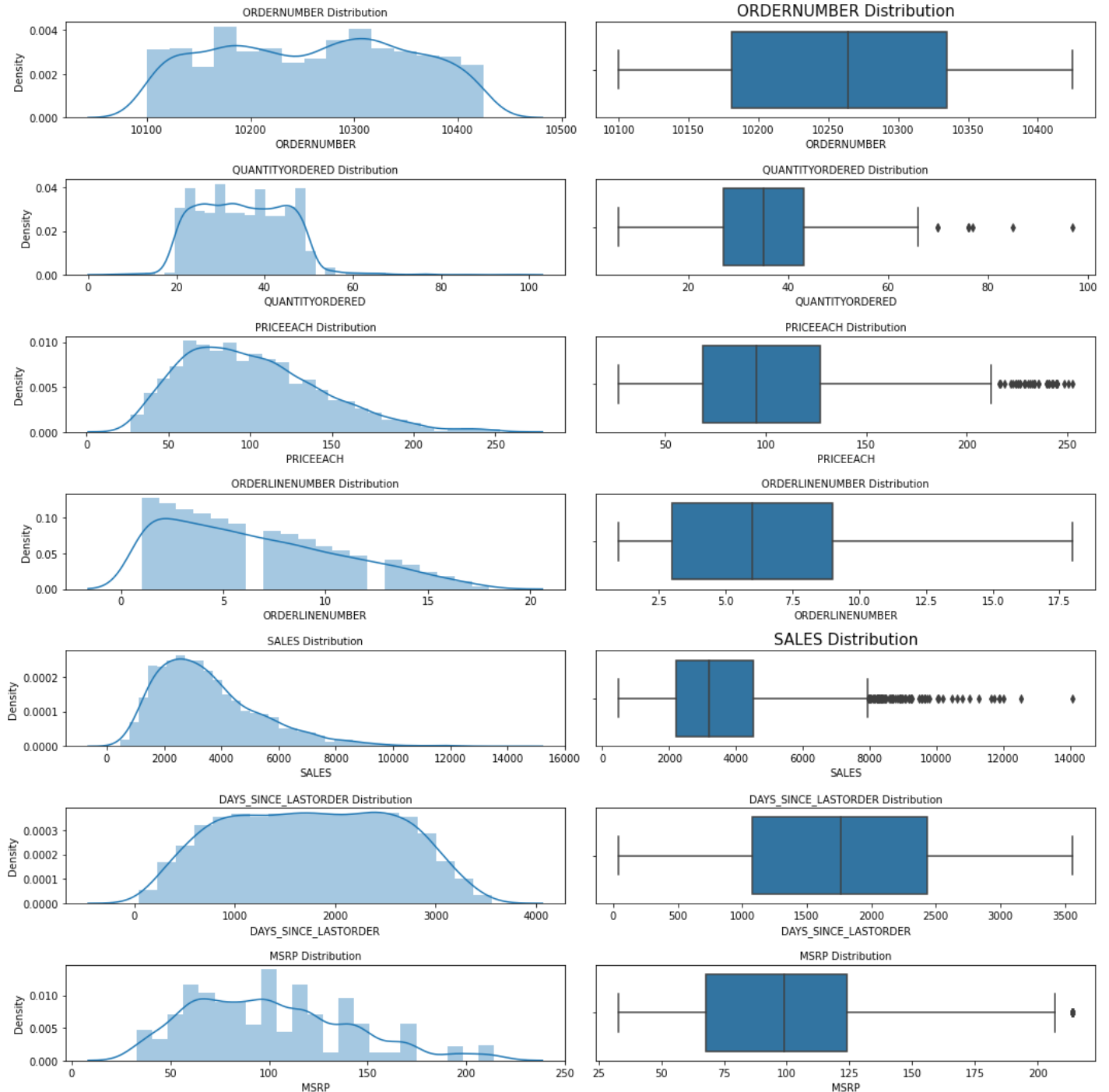
Using Seaborn library for plotting
pairplot()

A pairplot shows distribution and relationship of one variable with respect to other variables.



DISTRIBUTION OF DATA WRT NUMERICAL VARIABLES

We have used **distplot()** to show the distribution of data and **boxplot()** to show the 5-number summary and also check outliers



PANDAS PROFILING

We use pandas profiling for overall analysis of the data, its distribution, eda and its visualization according to variables using `profile_report()`

Example –
ProductLine variables in profile report : -

Pandas Profiling Report

Overview

Variables

Interactions

Correlations

Missing values

Overview

Overview

Warnings 17

Reproduction

Dataset statistics

Number of variables	20
Number of observations	2747
Missing cells	0
Missing cells (%)	0.0%
Duplicate rows	0
Duplicate rows (%)	0.0%
Total size in memory	429.3 KiB
Average record size in memory	160.0 B

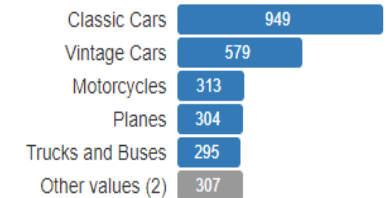
Variable types

CAT	12
NUM	7
DATE	1

PRODUCTLINE

Categorical

Distinct	7
Distinct (%)	0.3%
Missing	0
Missing (%)	0.0%
Memory size	21.5 KiB



Toggle details

Frequencies

Length

Common Values

Overview

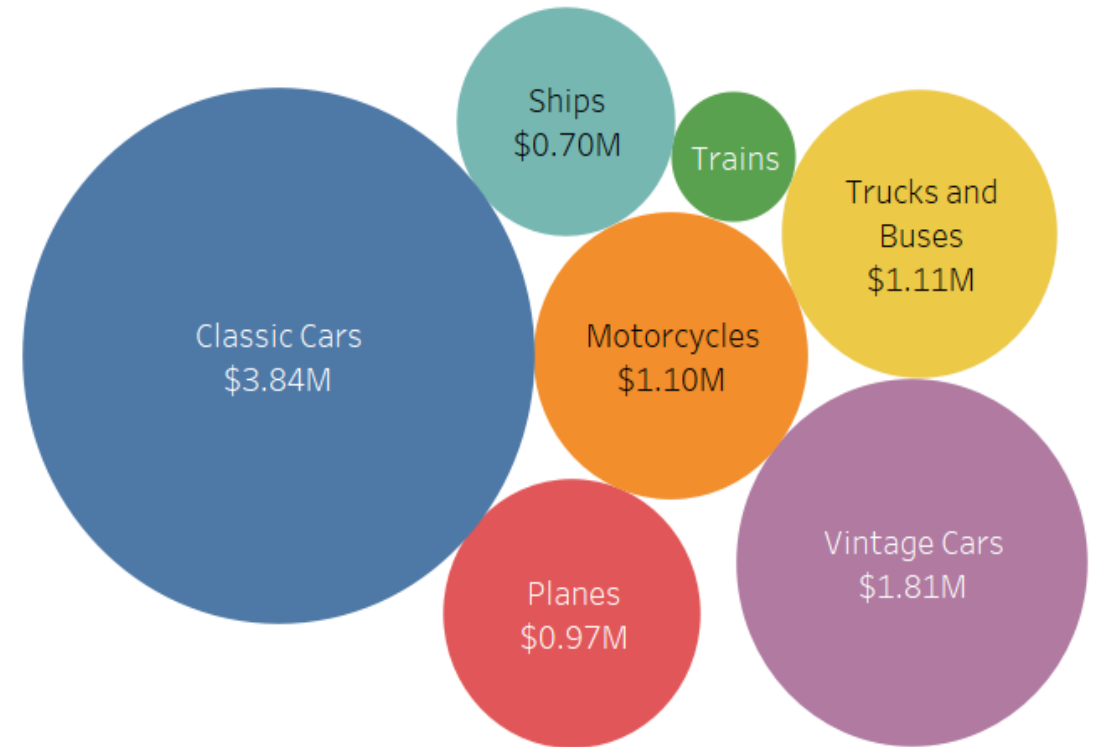
Chart

Value	Count	Frequency (%)
Classic Cars	949	34.5%
Vintage Cars	579	21.1%
Motorcycles	313	11.4%
Planes	304	11.1%
Trucks and Buses	295	10.7%
Ships	230	8.4%
Trains	77	2.8%

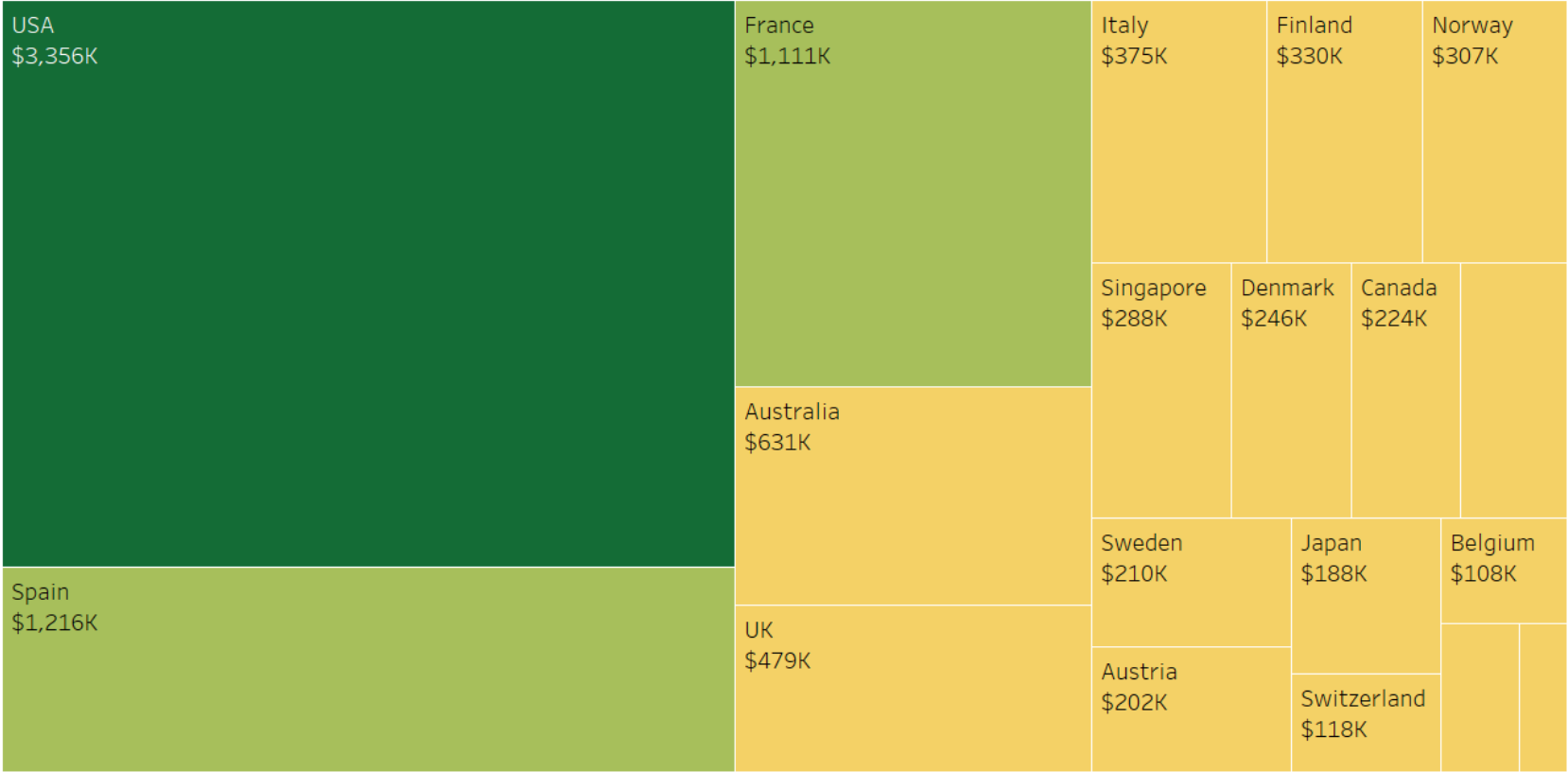
VISUALIZATION TO SEE SALES ACROSS DIFFERENT PRODUCT LINES

This is done using Tableau

Sales by Product Line

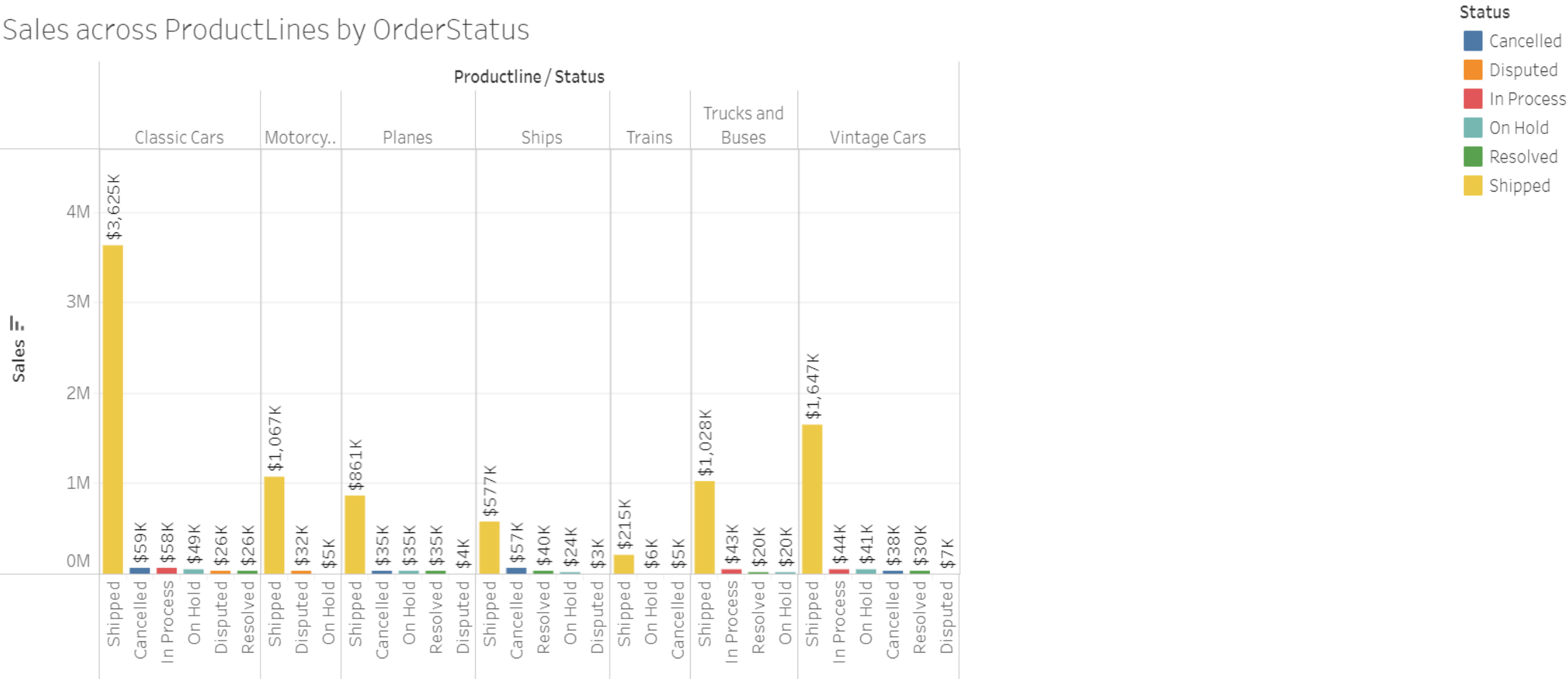


Sales by Country



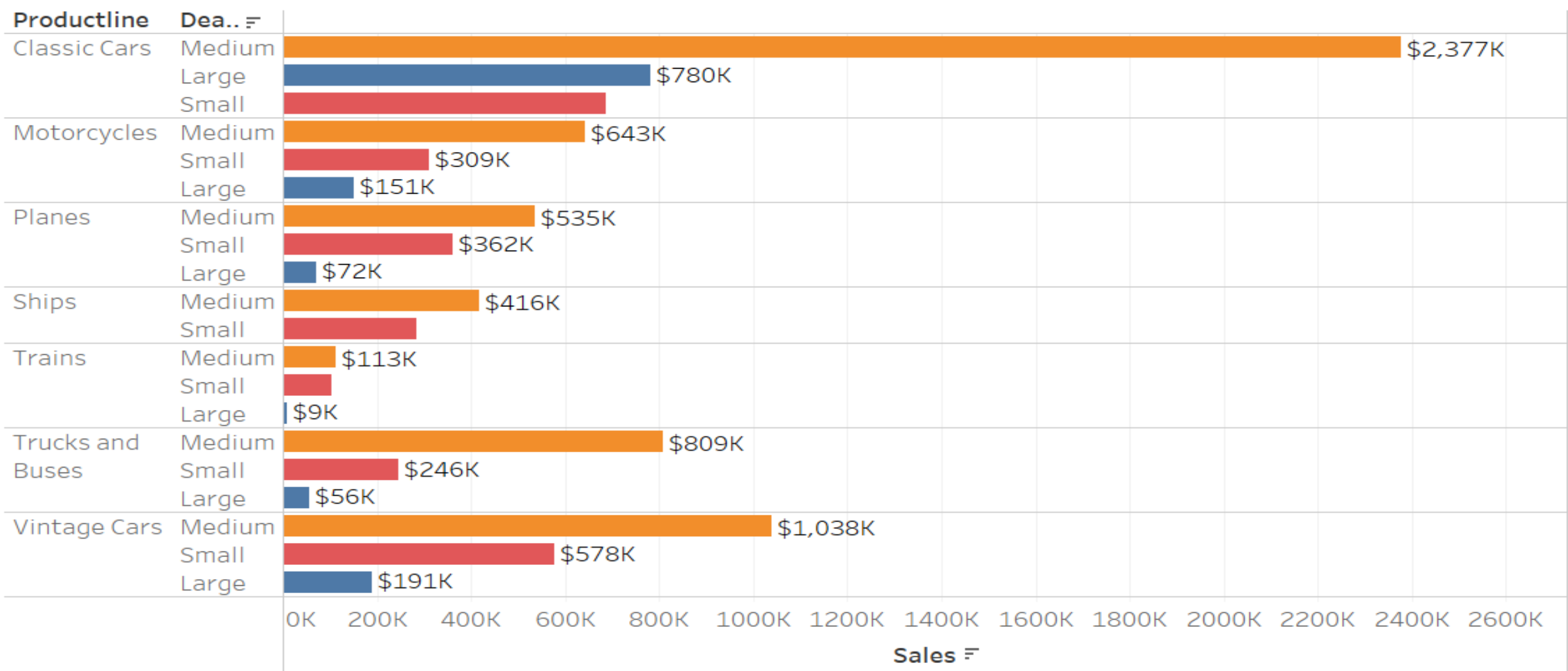
SALES ACROSS DIFFERENT COUNTRIES

Sales across ProductLines by OrderStatus



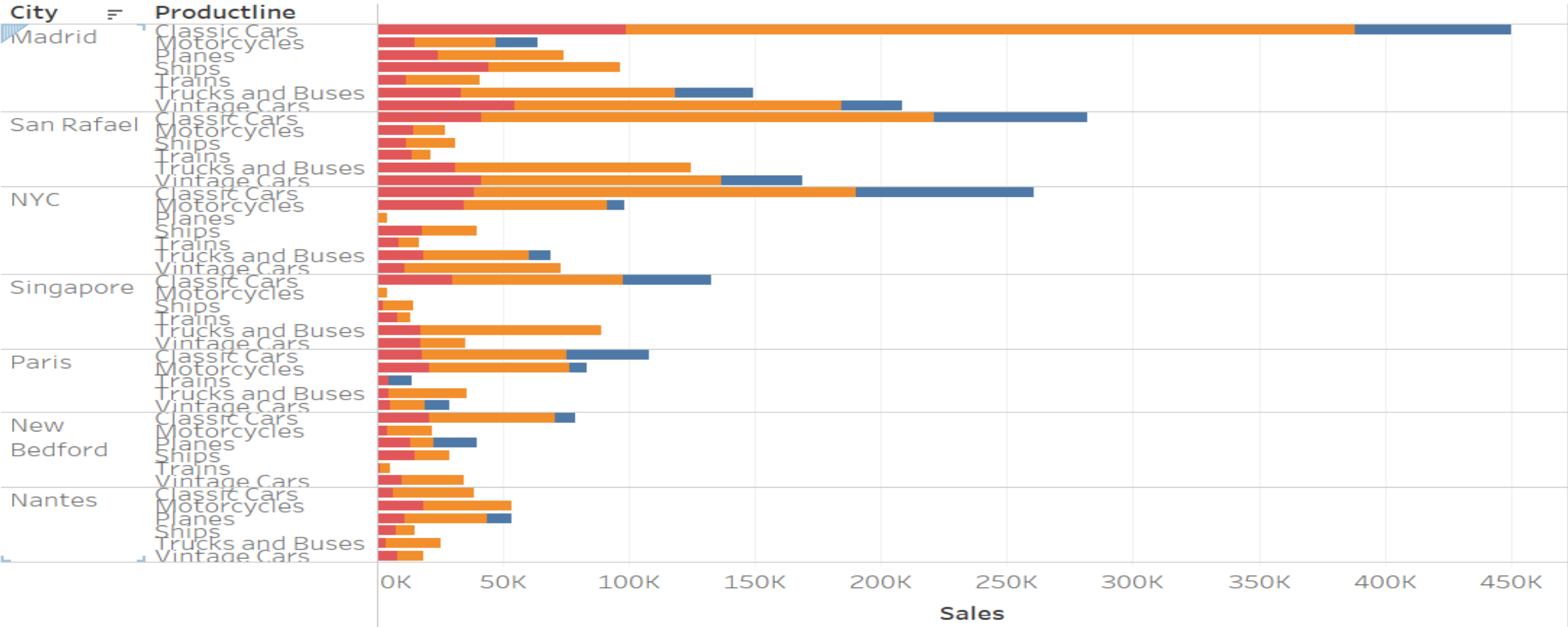
SALES ACROSS DIFFERENT CATEGORIES AND THEIR DELIVERY STATUS

Categories by DealSize



CATEGORIES BY DEAL SIZE

Sales across Cities and ProductLines by DealSize



DealSize

Large

Medium

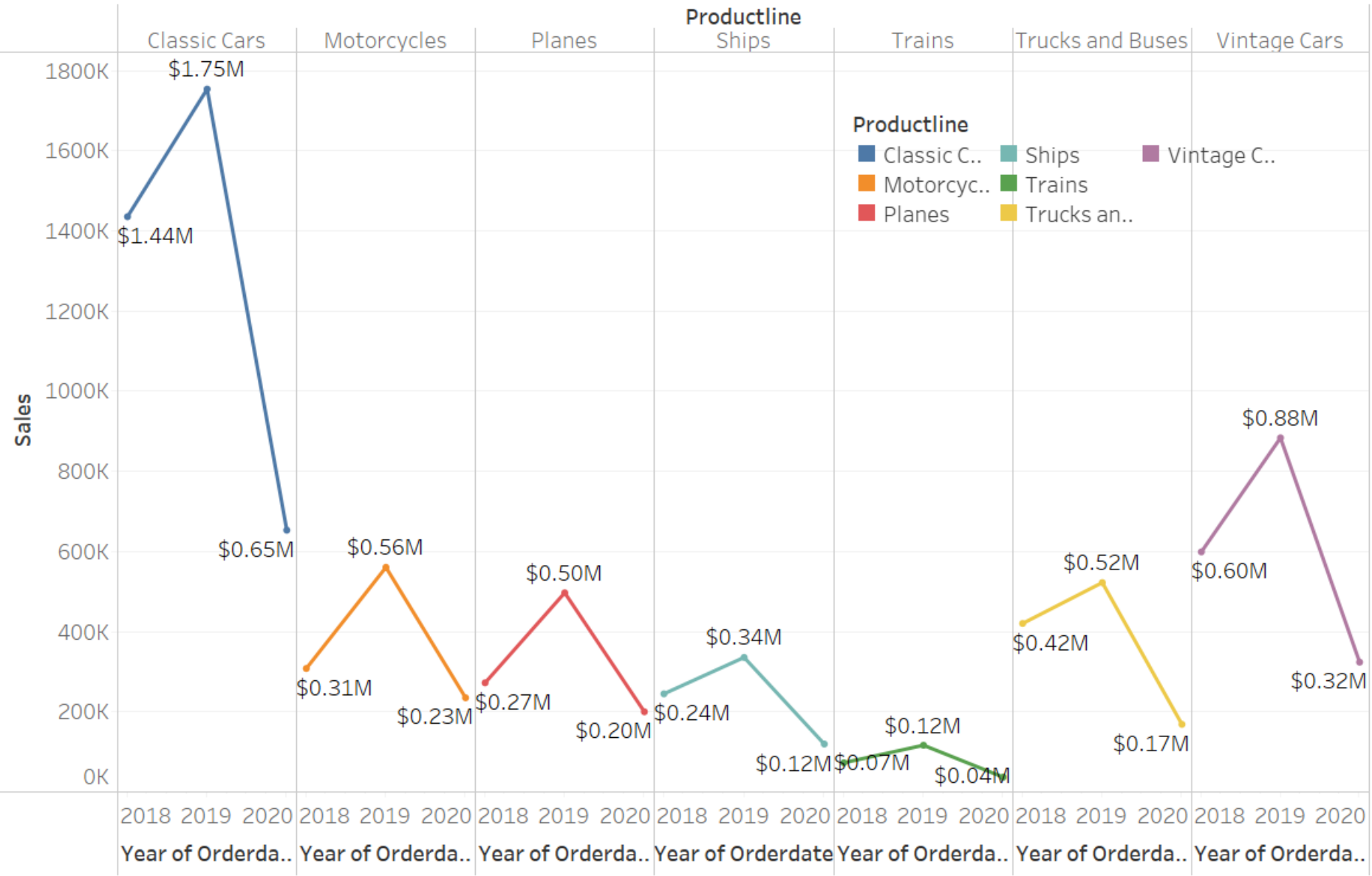
Small

TOP 7 CITIES WRT SALES AND DIFFERENT CATEGORIES

Annual Sales Trends

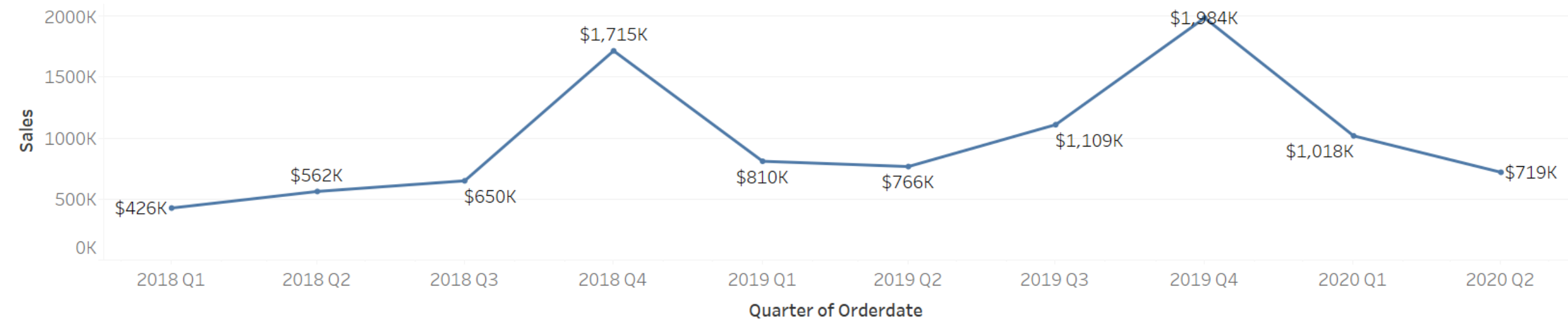


Annual Sales Trends by ProductLine

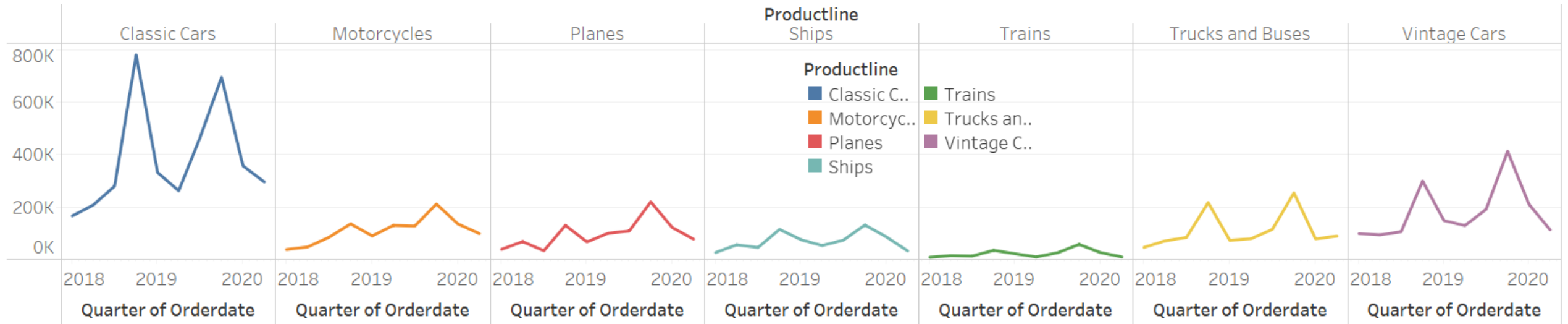


ANNUAL TRENDS

Quarterly Sales Trends

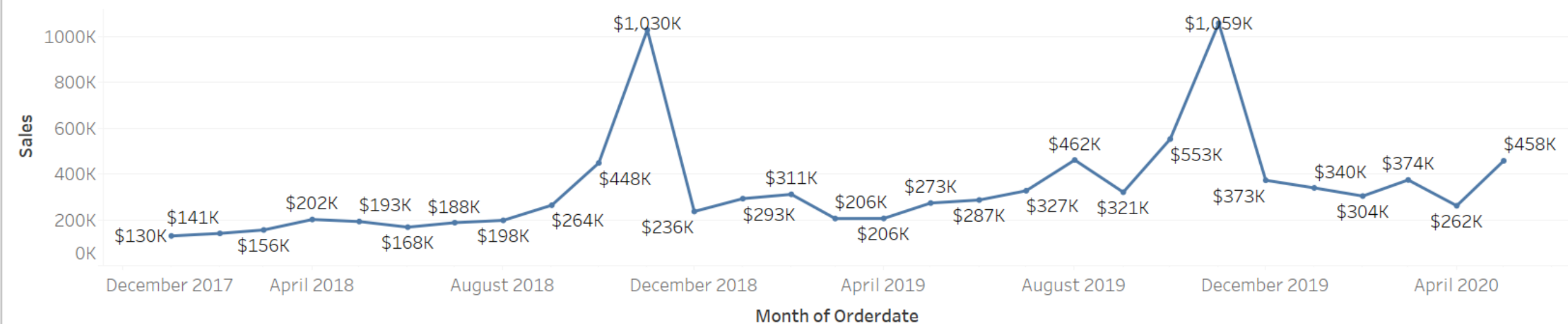


Quarterly Sales Trends by ProductLine

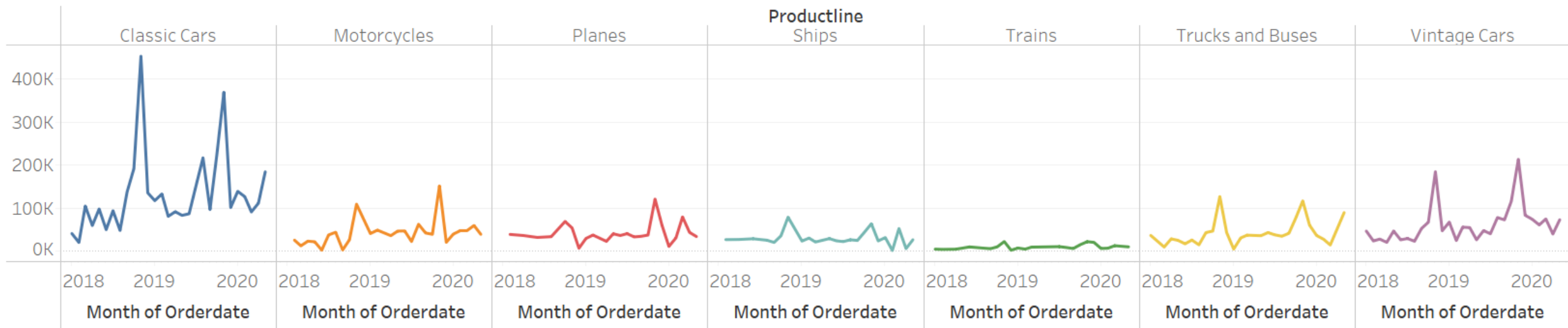


QUARTERLY TRENDS

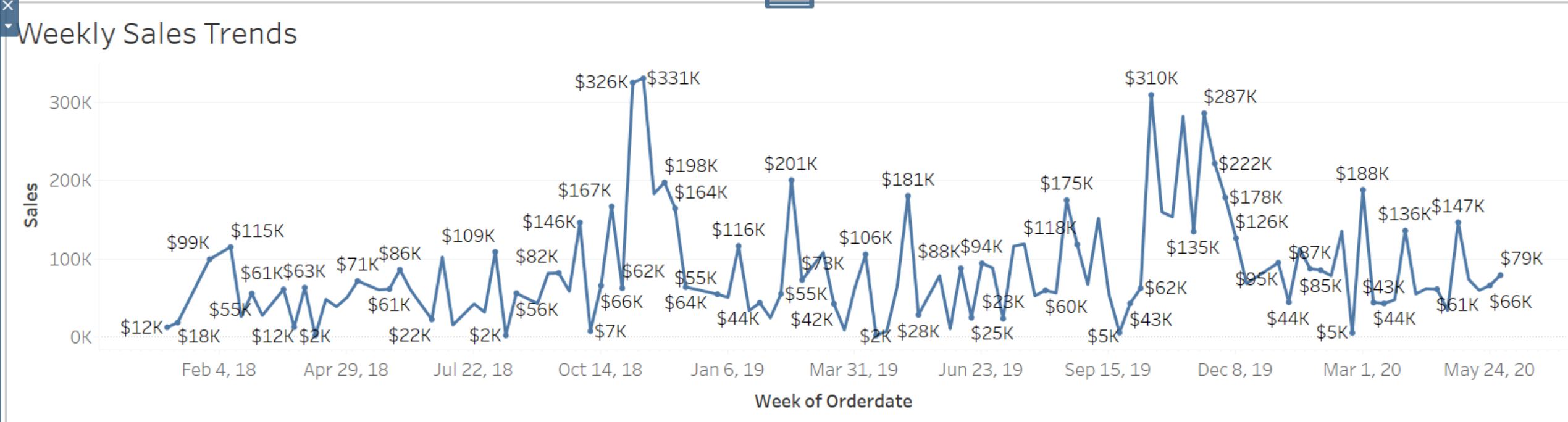
Monthly Sales Trends



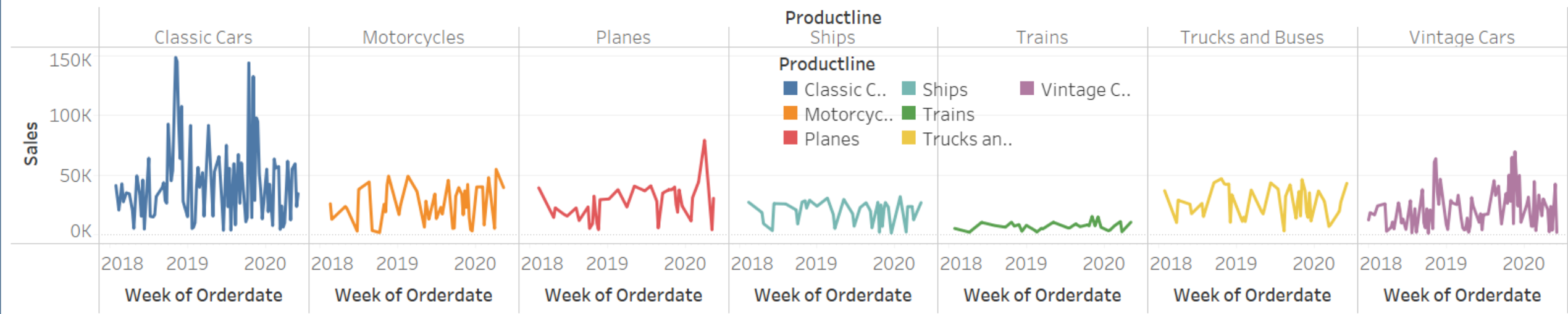
Monthly Sales Trends by ProductLine



MONTHLY TRENDS



Weekly Sales Trends by ProductLine



WEEKLY TRENDS

EDA INFERENCES

For more clearer visualization, we can refer -

https://public.tableau.com/views/Aadi_EDAforMRA/SalesacrossCitiesandProductLinesbyDealSize?:language=en-US&:display_count=n&:origin=viz_share_link

1. From the EDA, we can see that maximum sales is across Classic Cars categories and minimum is for Trains automobile parts over the period of 3 years.
2. USA, Spain and France are countries have maximum sales while Ireland, Phillipines and Belgium have lowest sales.
3. 2019 had greater sales than 2020 and 2018 across all the categories, we can also notice that Q4 sales are drastically higher than the other 3 quarters.
4. The order status for most of the orders are shipped followed by Cancelled, OnHold, Resolved, InProcess and Disputed.
5. Most of the biggest deal sizes across all the categories are medium followed by small and then large.

RFM — RECENCY, FREQUENCY, MONETARY

We have used **KNIME** to perform RFM Analysis.

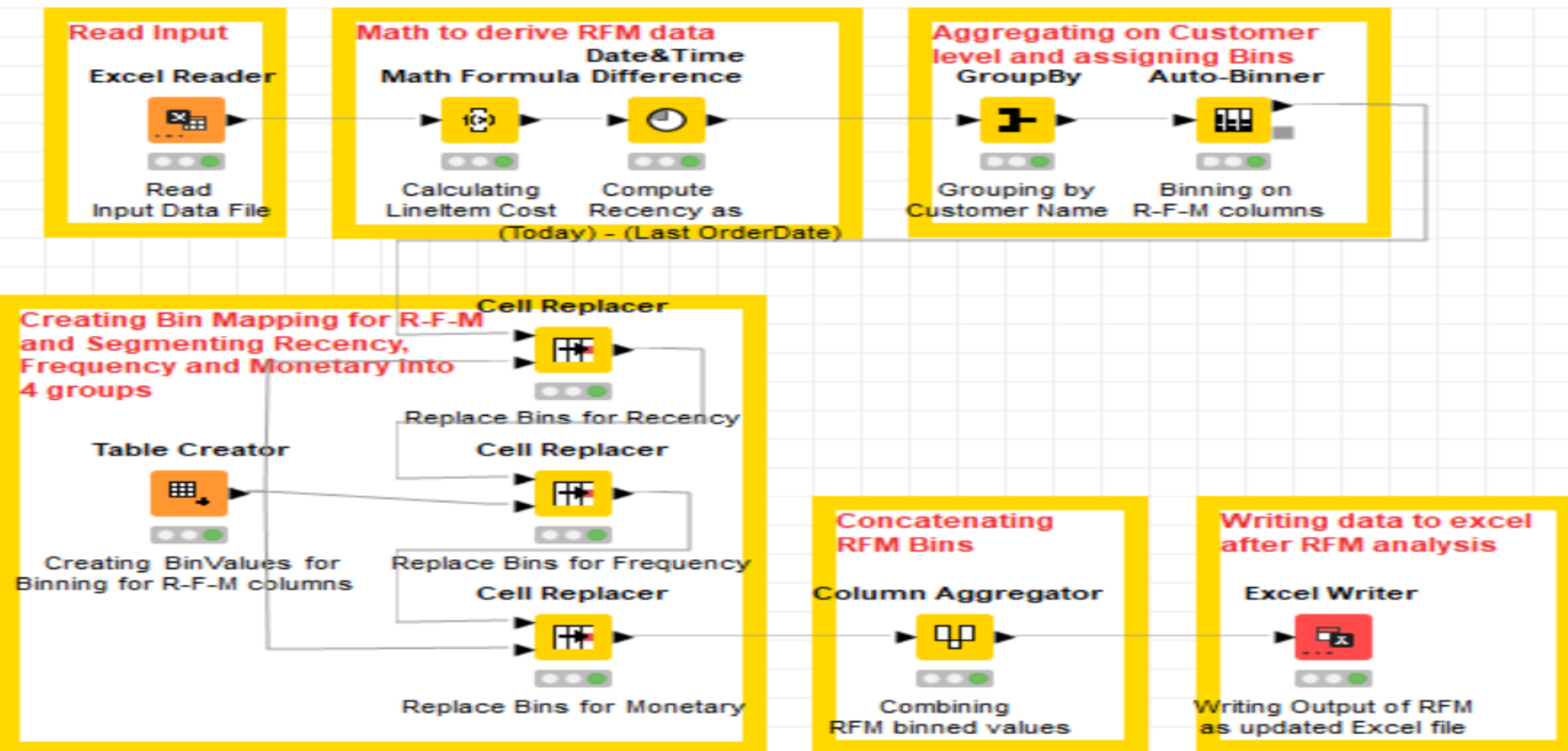
RFM is Recency, Frequency and Monetary Analysis that helps to analyze the customer relationship with the organization and helps in deriving inferences like behavior, loyalty, churning, and customers that have already moved out.

We compute **Recency** by **subtracting the current date – last ordered date** and reading the results in days.

We compute the **Frequency** by **grouping the data on customer level and counting the number of OrderNumbers**.

We calculate the **Monetary** by **multiplying PriceEach and QuantityOrdered**.

We have binned RFM in 4 buckets- Very High, High, Low and Very Low where maximum values of Frequency and Monetary are in Very High buckets and least values in Very Low buckets whereas Minimum values of Recency (in days) lies in Very High bucket and Maximum values of Recency lies in Very Low bucket.



RFM ANALYSIS — WORKFLOW DIAGRAM USING KNIME

RFM IN KNIME PROCESS

Read the input excel file.

Compute Monetary by Cost of Item * Quantity.

Compute Recency (current date – max(orderdate)) or min difference(current date – order date).

Grouping at customer level and calculating Frequency as count(order number) by customer.

Binning the RFM and replacing bin values and segmenting customers.

Aggregating RFM columns and then updating the columns in excel file.

OUTPUT OF RFM ANALYSIS (FIRST 5 CUSTOMERS)

Only the important/ necessary columns after RFM are shown.

CUSTOMERNAME	Frequency	Monetary	Recency(in days)	Frequency [Binned]	Monetary [Binned]	Recency [Binned]	Recency_FinalBins	Frequency_FinalBins	Monetary_FinalBins	Concatenate
AV Stores, Co.	51	157807.81	588	Bin 4	Bin 4	Bin 3	High	Very Low	Very Low	High Very Low Very Low
Alpha Cognac	20	70488.44	456	Bin 1	Bin 1	Bin 1	Very Low	Very High	Very High	Very Low Very High Very High
Amica Models & Co.	26	94117.26	657	Bin 2	Bin 3	Bin 4	Very High	High	Low	Very High High Low
Anna's Decorations, Ltd	46	153996.13	475	Bin 4	Bin 4	Bin 2	Low	Very Low	Very Low	Low Very Low Very Low
Atelier graphique	7	24179.96	580	Bin 1	Bin 1	Bin 3	High	Very High	Very High	High Very High Very High

RFM INFERENCES
— ASSUMPTIONS

<u>Recency Category</u>	<u>Frequency Category</u>	<u>Monetary Category</u>	<u>Assumption</u>
Very High	Very High	Very High	Best and Loyal Customer
Very High	Very High	High	
Very High	High	Very High	
Very High	High	High	
High	Very High	Very High	Loyal Customer
High	Very High	High	
High	High	High	
High	High	Low	
High	Low	High	Stable Customer
Very High	Low	High	Opportunity for Potential Customer
Very High	Low	Low	
Very High	Low	Very Low	
Very High	Very Low	Low	
Very High	Very Low	Very Low	
High	Low	Low	
High	Very Low	Very Low	
Low	Very High	Very High	Churn Important Customer
Low	High	Very High	
Low	High	High	
Very Low	High	High	
Very Low	Very High	Very High	
Low	Low	High	
Low	Low	Low	Churn
Low	Low	Very Low	
Low	Very Low	Low	
Low	Very Low	Very Low	
Very Low	Low	High	
Very Low	Low	Low	Lost Customer
Very Low	Very Low	Low	
Very Low	Very Low	Very Low	

OBSERVATIONS AND ASSUMPTIONS SUMMARY

Count of CUSTOMERNAME		Monetary_Category				
Recency_Category	Frequeny_Category	Very High	High	Low	Very Low	
Very High	Very High	9	1	0	0	
Very High	High	1	3	0	0	
Very High	Low	0	1	4	1	
Very High	Very Low	0	0	2	1	
High	Very High	6	1	0	0	
High	High	0	4	1	0	
High	Low	0	2	2	0	
High	Very Low	0	0	0	6	
Low	Very High	4	0	0	0	
Low	High	1	2	0	0	
Low	Low	0	4	6	1	
Low	Very Low	0	0	2	2	
Very Low	Very High	1	0	0	0	
Very Low	High	0	3	0	0	
Very Low	Low	0	1	3	0	
Very Low	Very Low	0	0	2	12	

Category	Sum of Count of Customers
Best and Loyal Customer	14
Loyal Customer	12
Churn Important Customer	11
Churn	16
Stable Customer	2
Opportunity for Potential Customer	17
Lost Customer	17
Grand Total	89

WHO ARE YOUR **BEST** CUSTOMERS? (GIVE AT LEAST 5)

There are **14 customers** that can be considered as the **best** customers.

This is because they lie in the **Top buckets** in all the **3 categories**- Recency, Frequency and Monetary.

Some of them are : -

CUSTOMERNAME	Frequency	Monetary	Recency	Frequency Bin	Monetary Bin	Recency Bin	Recency_Category	Frequency_Category	Monetary_Category
Euro Shopping Channel	259	912294.11	392	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Mini Gifts Distributors Ltd.	180	654858.06	394	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Reims Collectables	41	135042.94	454	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
L'ordine Souvenirs	39	142601.33	413	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
La Rochelle Gifts	53	180124.9	392	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Danish Wholesale Imports	36	145041.6	438	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Salzburg Collectables	40	149798.63	406	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
The Sharp Gifts Warehouse	40	160010.27	431	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Souvenirs And Things Co.	46	151570.98	394	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High

WHICH CUSTOMERS ARE ON THE VERGE OF CHURNING? (GIVE AT LEAST 5)

There are around 27 customers on the verge of churning.

The behaviour they exhibit is their recency and frequency lie in bottom 2 buckets.

Some of them are : -

CUSTOMERNAME	Frequency	Monetary	Recency	Frequency Bin	Monetary Bin	Recency Bin	Recency_Category	Frequency_Category	Monetary_Category
Royal Canadian Collectables, Ltd.	26	74634.85	677	Bin 2	Bin 2	Bin 4	Very Low	Low	Low
Norway Gifts By Mail, Co.	24	79224.23	676	Bin 2	Bin 2	Bin 4	Very Low	Low	Low
Collectable Mini Designs Co.	25	87489.23	852	Bin 2	Bin 2	Bin 4	Very Low	Low	Low
Amica Models & Co.	26	94117.26	657	Bin 2	Bin 3	Bin 4	Very Low	Low	High
Atelier graphique	7	24179.96	580	Bin 1	Bin 1	Bin 3	Low	Very Low	Very Low
Microscale Inc.	10	33144.93	602	Bin 1	Bin 1	Bin 3	Low	Very Low	Very Low
Volvo Model Replicas, Co	19	75754.88	586	Bin 1	Bin 2	Bin 3	Low	Very Low	Low
Classic Legends Inc.	20	77795.2	584	Bin 1	Bin 2	Bin 3	Low	Very Low	Low
Classic Gift Ideas, Inc	21	67506.97	622	Bin 2	Bin 1	Bin 3	Low	Low	Very Low
Canadian Gift Exchange Network	22	75238.92	614	Bin 2	Bin 2	Bin 3	Low	Low	Low
giftsbymail.co.uk	26	78240.84	604	Bin 2	Bin 2	Bin 3	Low	Low	Low
Enaco Distributors	23	78411.86	581	Bin 2	Bin 2	Bin 3	Low	Low	Low
Motor Mint Distributors Inc.	23	83682.16	588	Bin 2	Bin 2	Bin 3	Low	Low	Low
Blauer See Auto, Co.	22	85171.59	600	Bin 2	Bin 2	Bin 3	Low	Low	Low
Mini Classics	26	85555.99	621	Bin 2	Bin 2	Bin 3	Low	Low	Low
Vitachrome Inc.	25	88041.26	600	Bin 2	Bin 3	Bin 3	Low	Low	High
Cruz & Sons Co.	26	94015.73	589	Bin 2	Bin 3	Bin 3	Low	Low	High

WHO ARE YOUR **LOST** CUSTOMERS? (GIVE AT LEAST 5)

There are around **17 customers** that the Automobile company has lost.

Such customers have **lowest recency, lowest frequency** and **Monetary** category was in the **bottom 2 buckets**.

Some of them are : -

CUSTOMERNAME	Frequency	Monetary	Recency	Frequency Bin	Monetary Bin	Recency Bin	Recency_Category	Frequeny_Category	Monetary_Category
Bavarian Collectables Imports, Co.	14	34993.92	651	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Double Decker Gift Stores, Ltd	12	36019.04	887	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Cambridge Collectables Co.	11	36163.62	781	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
West Coast Collectables Co.	13	46084.64	880	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
CAF Imports	13	49642.05	831	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Signal Collectibles Ltd.	15	50218.51	868	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Iberia Gift Imports, Corp.	15	54723.62	630	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Online Mini Collectables	15	57197.96	656	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Clover Collections, Co.	16	57756.43	650	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Auto Assoc. & Cie.	18	64834.32	625	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Osaka Souvenirs Co.	20	67605.07	806	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Daedalus Designs Imports	20	69052.41	857	Bin 1	Bin 1	Bin 4	Very Low	Very Low	Very Low
Diecast Collectables	18	70859.78	793	Bin 1	Bin 2	Bin 4	Very Low	Very Low	Low
Super Scale Inc.	17	79472.07	785	Bin 1	Bin 2	Bin 4	Very Low	Very Low	Low

WHO ARE YOUR **LOYAL** CUSTOMERS? (GIVE AT LEAST 5)

We have around 26 loyal customers (including best customers).

Such customers have higher frequencies and recency.

CUSTOMERNAME	Frequency	Moneta	Recenc	Frequency Bin	Monetary B	Recency Bin	Recency_Catego	Frequeny_Catego	Monetary_Catego
Euro Shopping Channel	259	912294.1	392	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Mini Gifts Distributors Ltd.	180	654858.1	394	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Australian Collectors, Co.	55	200995.4	576	Bin 4	Bin 4	Bin 2	High	Very High	Very High
Muscle Machine Inc	48	197736.9	574	Bin 4	Bin 4	Bin 2	High	Very High	Very High
La Rochelle Gifts	53	180124.9	392	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Dragon Souvenirs, Ltd.	43	172989.7	482	Bin 4	Bin 4	Bin 2	High	Very High	Very High
The Sharp Gifts Warehouse	40	160010.3	431	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Anna's Decorations, Ltd	46	153996.1	475	Bin 4	Bin 4	Bin 2	High	Very High	Very High
Souvenirs And Things Co.	46	151571	394	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Salzburg Collectables	40	149798.6	406	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Danish Wholesale Imports	36	145041.6	438	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
L'ordine Souvenirs	39	142601.3	413	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Reims Collectables	41	135042.9	454	Bin 4	Bin 4	Bin 1	Very High	Very High	Very High
Scandinavian Gift Ideas	38	134259.3	481	Bin 4	Bin 4	Bin 2	High	Very High	Very High
Diecast Classics Inc.	31	122138.1	393	Bin 3	Bin 4	Bin 1	Very High	High	Very High