Sales Data Analysis

Dragana Ninkovic

Data Description

Data columns that are available:

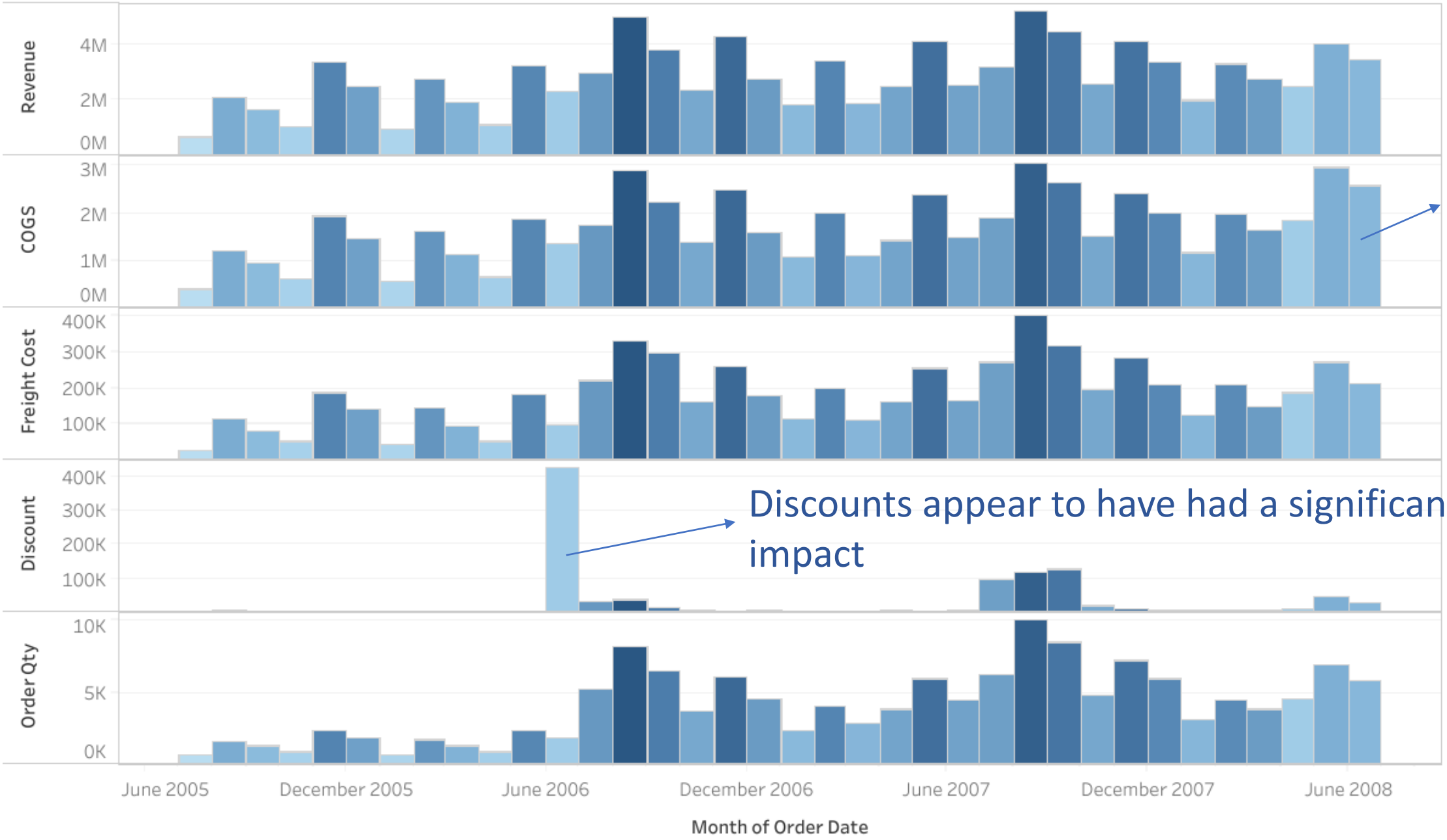
- Sales Order Number
- Order Date
- Due Date
- Ship Date
- Sales Person
- Sales Region
- Sales Province
- Sales City
- Sales Postal Code
- Unit Cost
- Unit Price
- Unit Price Discount
- Order Qty
- Unit Freight Cost
- Customer Code
- Customer Name
- Customer Region
- Customer Province
- Customer City
- Customer Postal Code
- Line Item Id
- Product Category
- Product Sub Category
- Product Name
- Product Code

Unit Price	Unit Price Discount	Order Qty	Unit Freight Cost	Revenue	Discount	COGS
41884.000000	41884.000000	41884.000000	41884.000000	41884.000000	41884.000000	41884.000000
797.107599	0.005290	3.462539	41.917555	2414.337341	23.671942	1450.496867
2.290000	0.000000	1.000000	0.034400	2.290000	0.000000	0.856500
61.920000	0.000000	2.000000	25.984800	224.970000	0.000000	107.878800
539.990000	0.000000	3.000000	35.776700	799.840000	0.000000	486.706600
1120.490000	0.000000	4.000000	50.405275	2863.000000	0.000000	1769.416600
3578.270000	0.400000	44.000000	274.109100	61985.820000	12993.711500	38530.385400
915.681850	0.034575	2.982925	26.273406	3874.045263	280.310578	2340.870578

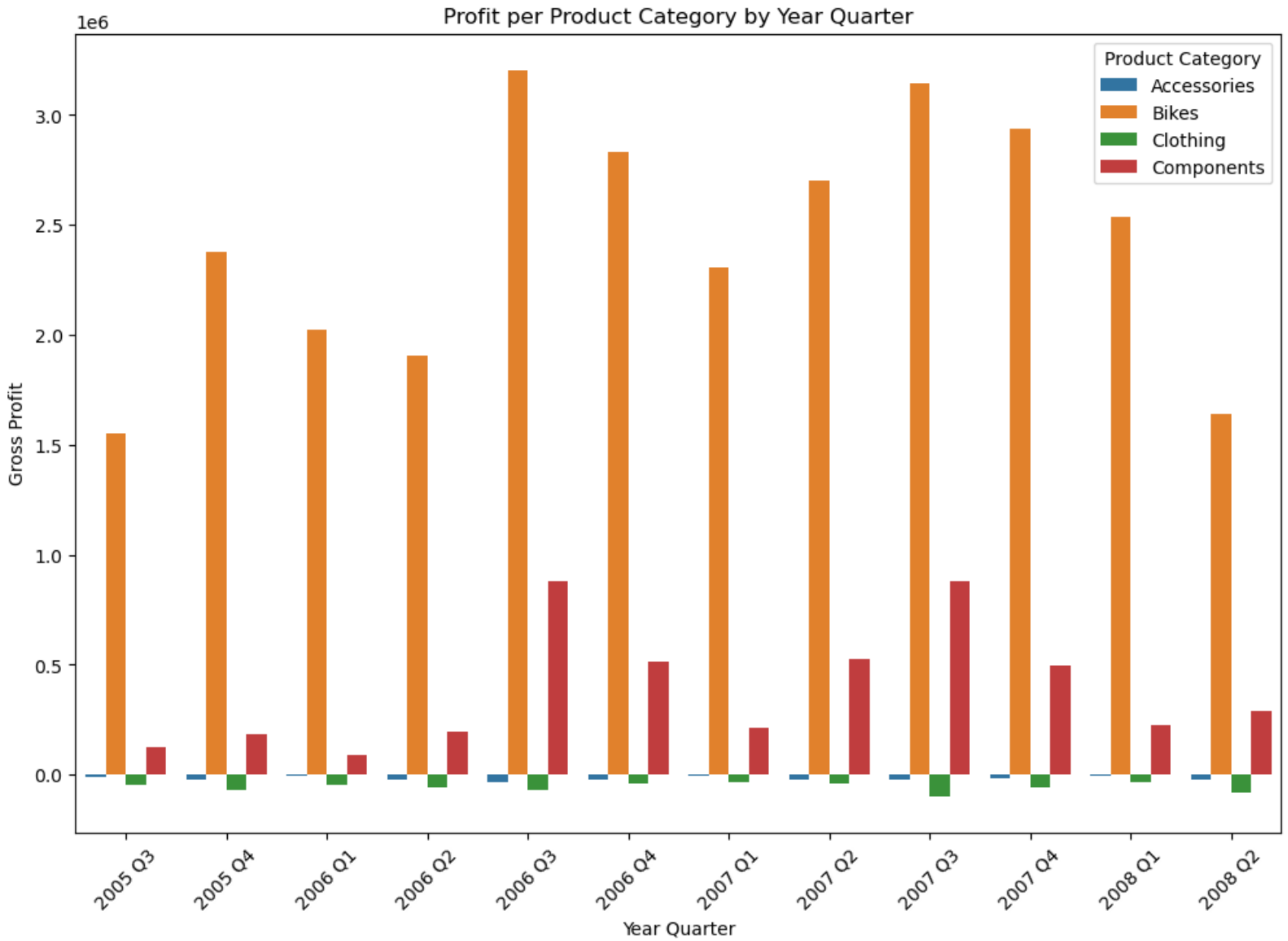
Derived data columns:

- Revenue – this column is calculated as $Unit\ Price * Order\ Qty$ and it represents how much is the price for customer per sale row
- COGS(Cost of Goods Sold) - this column is calculated as $Unit\ Cost * Order\ Qty$ and it represents how much is the cost of making the product per sale row
- Freight Cost - this column is calculated as $Unit\ Freight\ Cost * Order\ Qty$ and represents how much we spend on Freight by sale row
- Discount – this column is calculated as $Unit\ Price * Unit\ Price\ Discount * Order\ Qty$ an represents how much is the discount per sale row
- Profit – this column is calculated as $Revenue - COGS - Freight\ Cost - Discount$
- Profit Margin – this column is calculated as $\frac{Profit}{Revenue}$

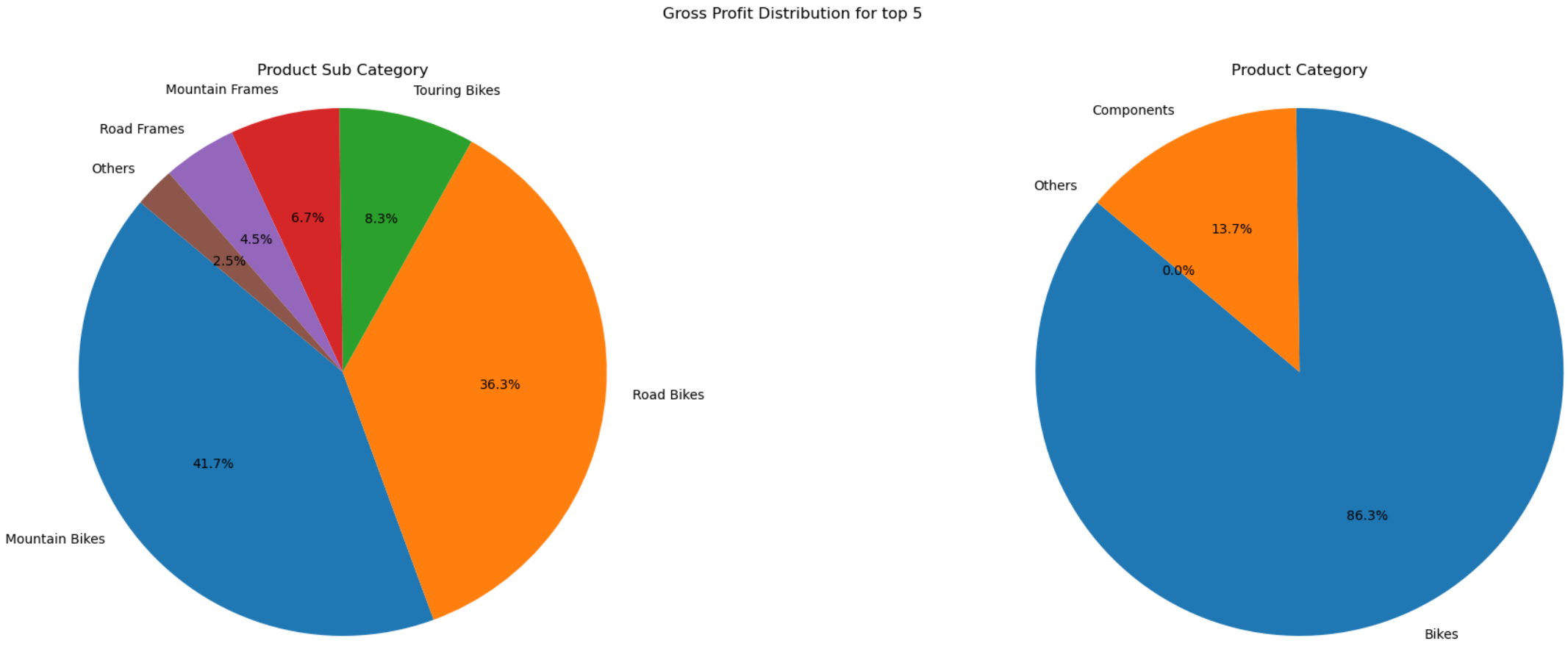
Important Features Per Month



Accessories and Clothing have consistently posted negative profits each quarter over the past three years. We should consider stop selling them.



Mountain Bikes and Road Bikes are the top-selling products, contributing 78% of the positive profit share. It is crucial to focus on them.



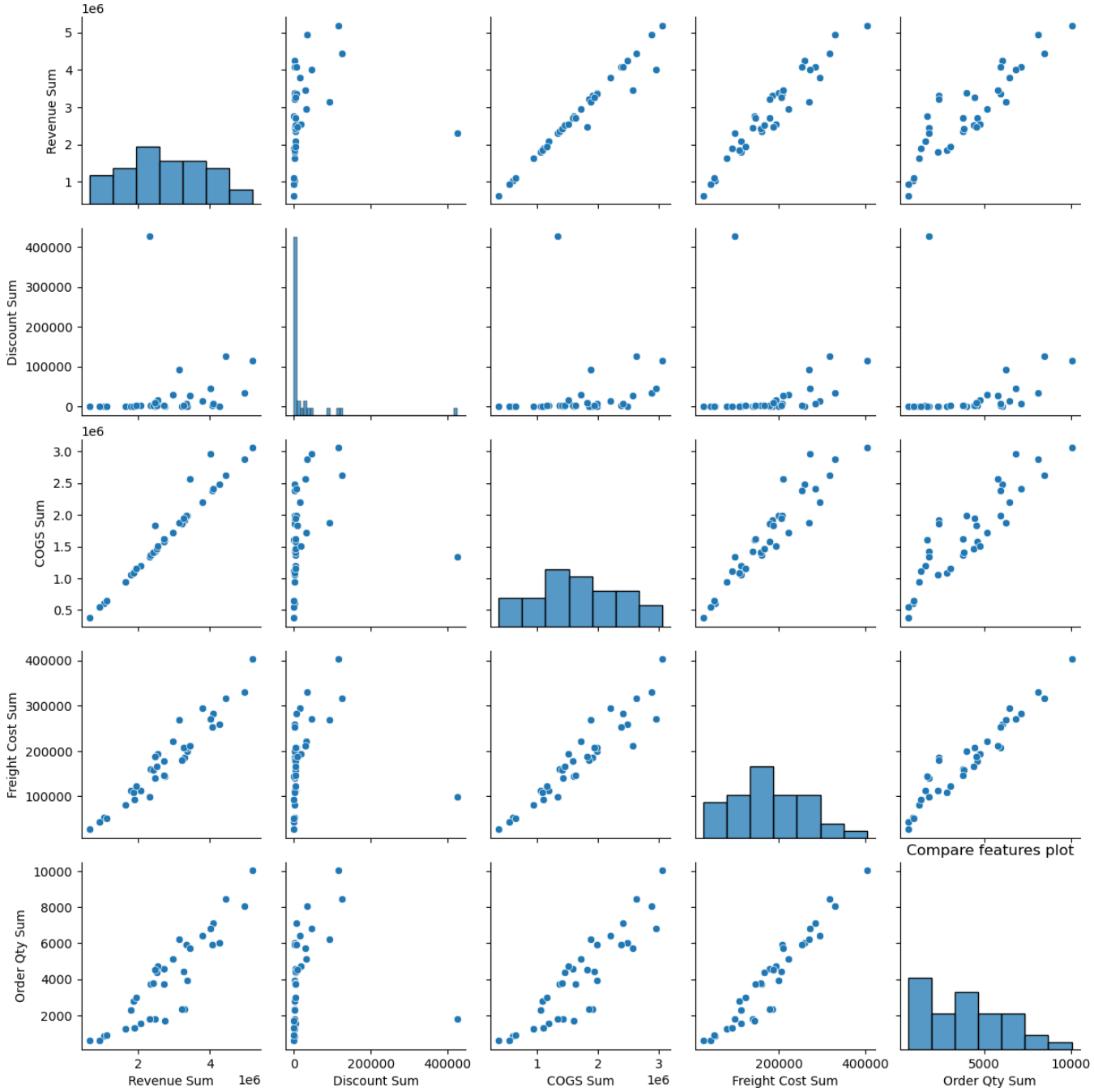
- There is linear dependency between features except from discount
- There are some workers gaining much more profit than others – we should think about giving them a raise

Sales Person

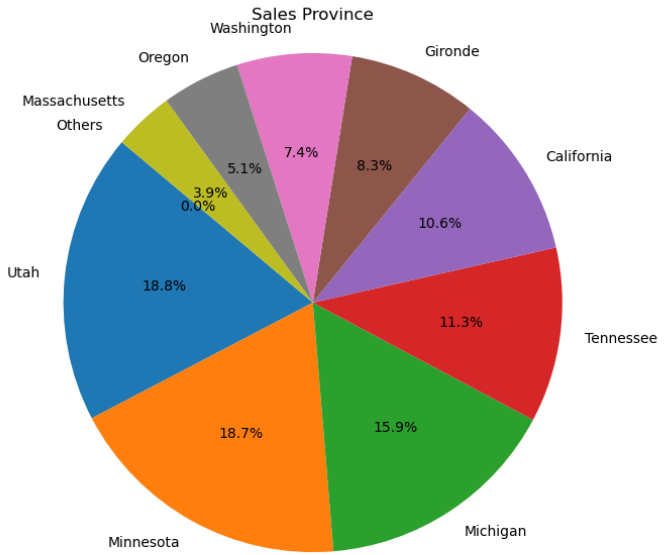
Sales Person	Order Date 2005	2006	2007	2008
Amy Alberts		6,838	50,027	1,142
David Campbell	319,905	736,226	809,991	298,039
Jillian Carson	762,465	2,307,139	2,125,757	585,159
Linda Mitchell	725,553	2,008,057	2,402,073	810,381
Michael Blythe	466,836	1,890,621	2,306,544	688,061
Pamela Ansman-Wolfe	384,014	751,730	536,804	297,111
Rachel Valdez				144
Ranjit Varkey Chudukatil		455,126	1,131,519	501,995
Shu Ito	549,435	1,276,519	1,315,583	443,661
Stephen Jiang	17,941	182,594	182,484	97,159
Tete Mensa-Annan		161,663	704,582	343,331
Tsvi Reiter	868,968	1,568,423	1,350,084	481,073

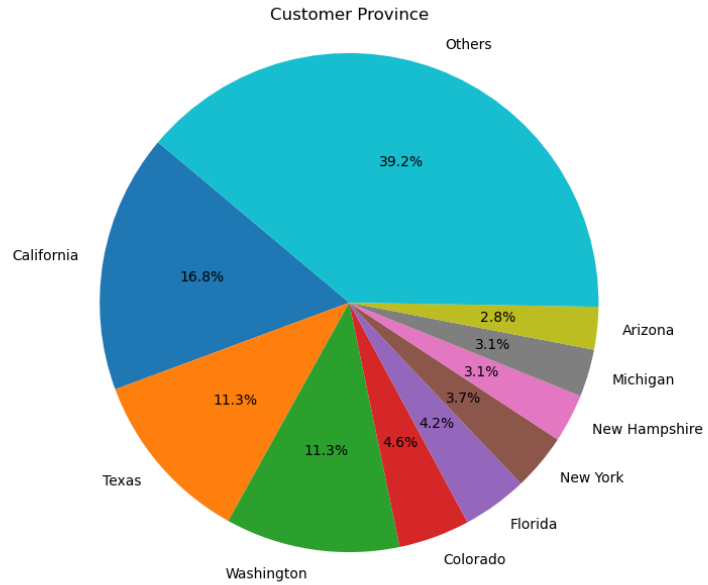
Profit

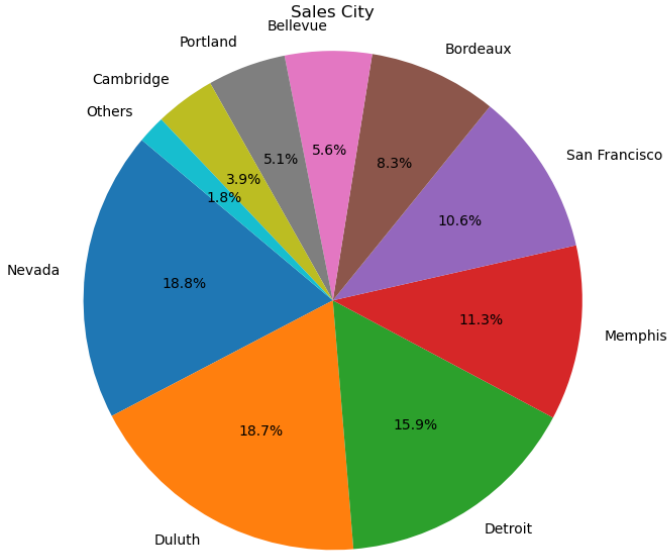
144

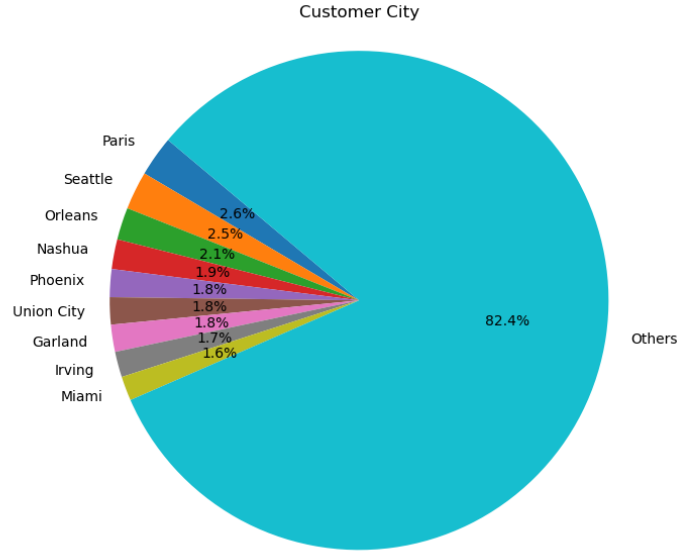


Profit share by geography (top 10 locations) should be the focus when making decisions.

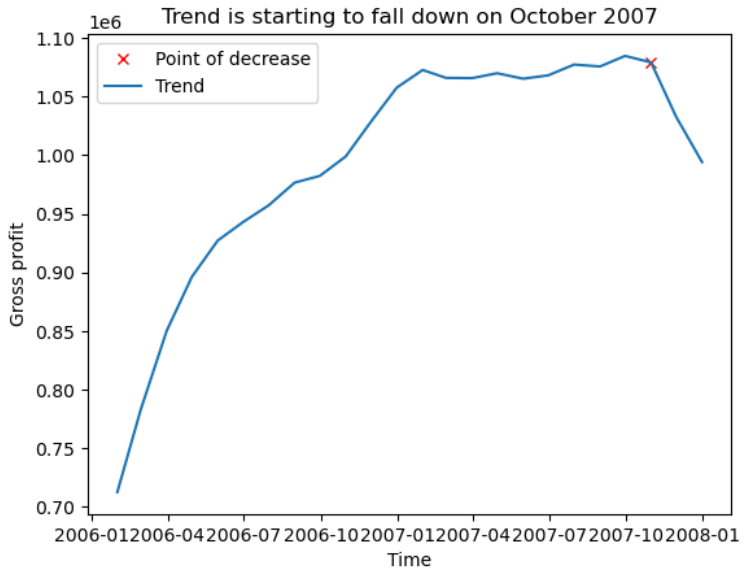


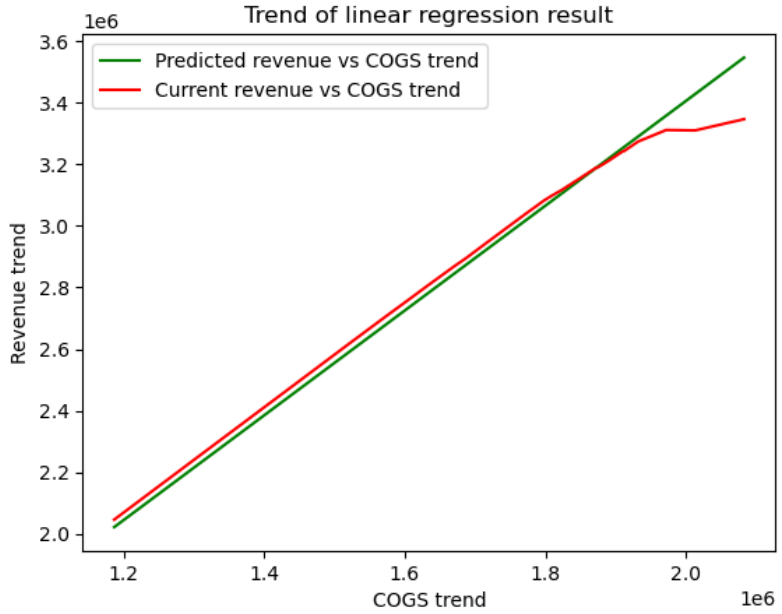


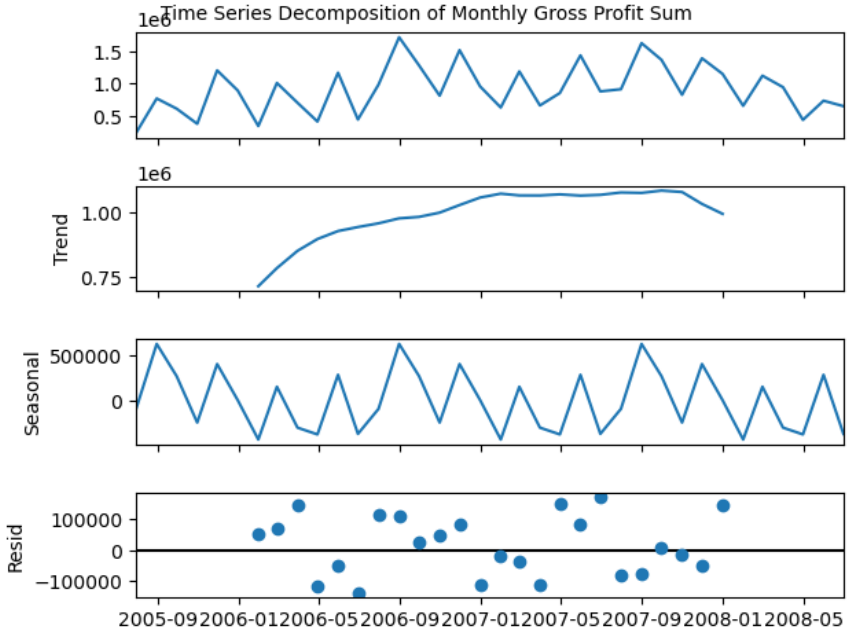




Profit has been analyzed and broken down into three components: periodic patterns, overall trend, and random variations. A significant drop in profit was observed in October 2007, which was attributed to an event that caused a spike in the rise costs of goods sold (COGS) while revenue rise remained unchanged. To address this issue, we propose making revenue and COGS proportional. This adjustment would decrease the volume by 0.0002 relative to revenue, minimizing risk.





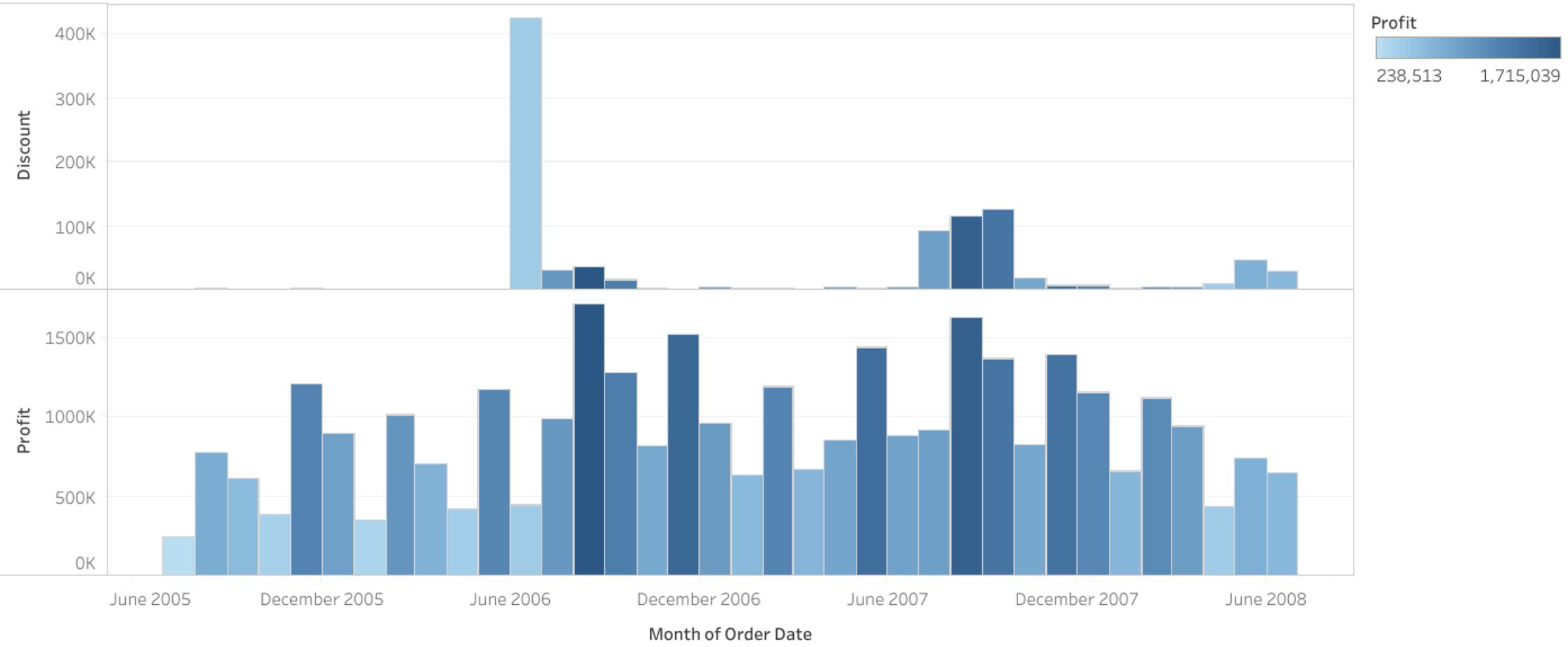


The average profit increased significantly after the first big discount but decreased slightly after the second discount. This decline could also be due to an increase in the cost of goods sold (COGS).

Discount effect

Before First Discount	Between Big Discounts	After Big Discounts	AVG PROFIT	Distinct count of Or..	Profit
False	False	True	991,249	11	10,903,739
	True	False	1,063,240	13	13,822,122
True	False	False	681,396	12	8,176,752

Discount effect (2)



Further work:

- Analyse if current features (REVENUE, COGS, COST, DISCOUNT, QUANTITY) have effect on features shifted in time
- Take deeper look into the discount effect to see if discount will increase the quantity after we increase the prices
- Do more analysis on separate products