**Section 1**

**Section 1.1 - Running Total Profit by Category**

Figure 1.1 shows the running total for profit across the three main product categories, furniture, office supplies, and technology. As you can see, technology profits far outpace both office supplies and technology. While these categories appear to hold consistent growth rates in terms of profit, the rate at which they do so varies greatly. My recommendation based off of this figure is to put more of a focus into the technology sector which consistently generates the highest profit for the company.

**Section 1.2 – Running Total Profit by Sub-Category**

Figure 1.2 is similar to 1.1 where it shows a running total of profits over time, but instead focuses on subcategories within the main three categories of items. This figure shows that the majority of items hold steady, although limited growth in profits overtime. There are a few outliers in both directions, however. Phones jumped out early as the highest generator of profits, but was overtaken by copiers in late 2013. Bookcases also show promise as their profits have trended upwards throughout 2014 at a higher rate than the majority of products. There is one product that has consistently led to negative profits, that being tables. Tables have never seen any profit in terms of a running total, and only continue to lose more and more over time. It would be my recommendation to discontinue the sales of tables entirely, and to instead put a focus into the products such as phones and copiers and other products in the technology sector that trend upwards over time consistently.

**Section 1.3 - Three Month Profit Moving Average**

Figure 1.3 provides insight into the three month profit moving average. As you can see across all product categories there is a similar trend. Notably, the average consistently reaches the highest in the later months of the year, typically around October, November, and December. It consistently falls the lowest in the first few months of the year around March, and April. This shows consumer habits in general rather than specific categories of products, so it would be my recommendation to look into sales and promotions in the months where profits dip in order to keep inventory moving.

**Section 1.4 - Month over Month Profit Change**

Figure 1.4 shows the month over month profit change across the three major categories of items. As you can see all categories of items follow similar trends where if one category has a negative month over month change in profit, then the other categories do as well. This was also indicated by Figure 1.3 which contains the three month moving average for profit. This figure further shows the discrepancy in profits each month and displays outliers such as January 2012 which was a major loss for all categories, and major gains such as December 2021. It would be my recommendation based off of this figure to combine it with the insights of figure 1.3 in order to better time sales to drive profits.

**Section 1.5 - Year over Year Unit Change**

Figure 1.5 shows the year of year change in sales of units. This data is useful to compare the different categories of products across time and consider growth any growth or loss in the number of products sold. As you can see in this figure, almost all products have a positive year over year growth, and technology consistently has the highest growth rate with office supplies close behind. Furniture has a considerably lower year over year growth rate in terms of units. It would be my recommendation to combine the insights of this data with Figure 1.1 and 1.2 in order to evaluate which furniture items to continue offering, and which to discontinue in order to stop the bleeding of profits.

**Section 1.6 - % of Subcategory by Year**

Figure 1.5 illustrates the percent of profits that each subcategory makes up each year. As you can see this chart is a divided up into the different categories as well as subcategories to help show which items are the most volatile. We can see that copiers, binders, and machines vary the most for their respective categories of furniture, office supplies, and technology. Since the rest of the products consistently make up similar percentages of each category historically, I would recommend looking back at what has made these three items so volatile in the past and consider doing more research where these items could be headed next in order to capitalize on rising and falling volatility.

**Section 2**

**Section 2.2 – Running Totals by Year**

Figure 2.2 shows the running totals of profit by year, as well as the profit for each individual year. From this we can see a steady increase in profit of the years, the rate of which slowly increases. As you can see from looking at the different categories, office supplies and technology are responsible for the majority of profits. While office supplies and technology both breach the 100k mark in 2014, furniture lags behind and has still yet to see 25k in profit.

**Section 2.3 - Moving average of profit**

Figure 2.2 shows the moving average profit by month. As you can see, there is a high variance between monthly profits. However, the moving average minimizes these differences and provides a smoother average. Even in months where profit is low such as July, the moving average remains in the same position as June, and also shows little change in July. The overall trend of the moving average is upwards which shows that overall the company is in good shape.

**Section 2.4 – Number of Units Sold and Moving Average of Profit**

Figure 2.4 shows the number of units sold, as well as the moving average of profit. As you can see, this figure displays that there are always dips in the number of units sold in the early months of each year, and gradually increase before rapidly increasing in the final months. This is indicative of consumer habits and the holiday season where people spend the most money. Profits often follow this trend of increased sales, but in 2014 the moving average of profits appears to decline. Further analysis may need to be done to find the cause of this.

**Section 2.5 – Sub-Category Percentage of Profit**

Figure 2.5 shows the percentage of profit that each subcategory makes up each year. From this figure we can see which products are the most worthwhile stocking, and which do not generate much profit, or incur losses. For example tables are never profitable and should not be sold, and bookcases almost always lose or make negligible profit. Accessories, phones, and copiers however consistently make up the highest percentage of overall profit and should be focused on.

**Section 2.6 – YTD Units Sold**

Figure 2.6 shows the YTD units sold for different subcategories. This is important since it provides insights on when consumers are purchasing certain products. With this information sales can be appropriately times in order to have a higher conversion rate and maximize profits. In the figure provided the metrics for phones, one of the highest profit driving products, is shown. As you can see there is a steady increase in YTD sales for most of the year up until the end. Sales sharply increase in the final months of the year in line with the holiday season. More broadly when compared with the data of all technology products we can see similar data reflected. This is key to understanding which products should be stocked and when in order to maximize both supply chain management, as well as inventory.

Appendix

USE Featherman\_Analytics

SELECT Category

,[Sub-Category]

,(YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date]) as [YearMonth]

,YEAR(i.[Order Date]) as [Year]

,FORMAT(SUM(i.Profit),'N0') as [Monthly Profit]

-- Running total profit column that resets every time the sub category or category changes

,SUM(SUM(i.[Profit]))

OVER

(PARTITION BY[Category], [Sub-Category]

ORDER BY (YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date])

) as [Profit Running Total]

-- 3 month moving average that resets when the sub-category or category changes

, FORMAT(AVG(SUM(i.[Profit]))

OVER

(PARTITION BY[Category],[Sub-Category]

ORDER BY (Year(i.[Order Date])\*100)+MONTH(i.[Order Date])

ROWS BETWEEN 2 PRECEDING and CURRENT ROW),'N0')

as [3 Month Profit Moving Average]

-- month over month change in profit column that resets on sub-category or category.

, SUM(i.[Profit]) - LAG(SUM(i.[Profit]),1,NULL)

OVER (PARTITION BY[Category],[Sub-Category]

ORDER BY(YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date]))

as [Month over Month Profit]

-- year over year change in units that resets on sub-category or category

, SUM(i.[Quantity]) - LAG(SUM(i.[Quantity]),12,NULL)

OVER (PARTITION BY[Category],[Sub-Category]

ORDER BY(YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date]))

as [Year over Year Units]

-- Month over Month Change (Up/Down)

, IIF(SUM(i.[Profit])>

LAG(SUM(i.[Profit]),1,NULL)

OVER(PARTITION BY[Category],[Sub-Category]

ORDER BY(YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date]))

,'Up','Down') as [MoM Profit Trend]

-- Extra metric: % of Sub Category by year

,FORMAT(SUM(i.[Profit])/SUM(SUM(i.[Profit]))

OVER

(PARTITION BY[Sub-Category],YEAR(i.[Order Date])),'P2')

as [% of Sub Category by Year]

FROM SuperStore\_Global.Orders as i

GROUP BY [Category]

, [Sub-Category]

, YEAR(i.[Order Date])

, (YEAR(i.[Order Date])\*100)+MONTH(i.[Order Date])

ORDER BY Category,[Sub-Category], YearMonth