ASSIGNMENT 2: EARNEST AND DECEPTIVE VISUALIZATIONS

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Introduction

For this excercise, we would use the yahoo finance dataset. The yfinance dataset contains detailed stock market data, including information like daily stock prices (opening, closing, highs, and lows), trading volumes, and historical records. It also provides key financial metrics such as market capitalization and price-to-earnings ratios, which are useful for tracking stock performance over time. This data is easily accessible using the yfinance library, which allows users to pull both real-time and past financial data for analysis.

What is the Month on month stock percentage change for the top 3 companies in the SP 500?

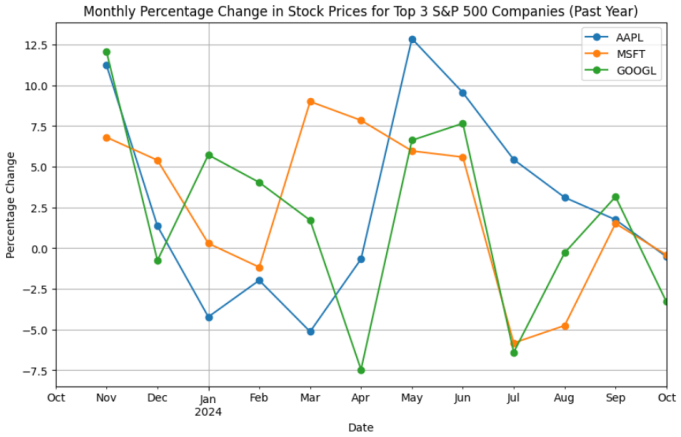

Figure 1: Line chart for monthly percantage change in Stock Price for Apple, Google and Microsoft (Past Year)

This graph shows the monthly percentage changes in stock prices for three of the largest companies in the SP 500 index over the course of the past year. It visually compares how the stock prices of Apple (AAPL), Microsoft (MSFT), and Google (GOOGL) have fluctuated over time, providing a sense of the volatility and performance of these companies in relation to each other.

Different colors of the graphs make it easier to understand the variations it indicates in the percentage change over time with multiple companies.

What is the Monthly positive change in the market by these companies?

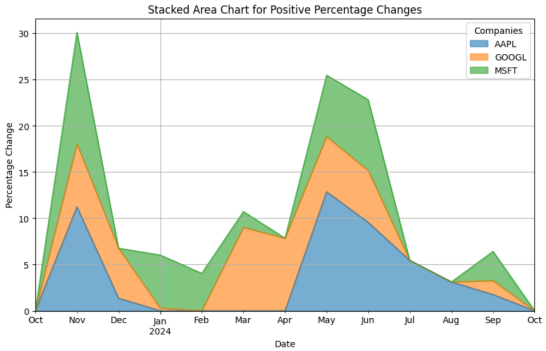

Figure 2: Stacked Area chart for Monthly Percentage change in Stock Price for Apple, Google and Microsoft (Past Year)

The stacked area chart represents cumulative data values which indicates collective positive percent change or collective impact in the market by the respective companies altogether. The stacked area chart effectively shows the combined growth of the three companies over time, making it easy to see how their collective performance contributes to the overall positive percentage changes. This is especially useful when the goal is to highlight the total impact of multiple entities.

By stacking the data, the chart allows for an easy comparison of how each company's performance contributes to the overall market trend. It highlights periods where one company's stock rose more than the others. Additionally, the chart clearly shows when certain companies experienced significant growth over time, making trends in positive stock changes easy to spot.

Also, The smooth transitions between months and clear labeling (with distinct color coding for each company) make the chart easy to interpret for a general audience, even without prior financial expertise.

What is the Stock price Trend for these companies?

Last 3 months

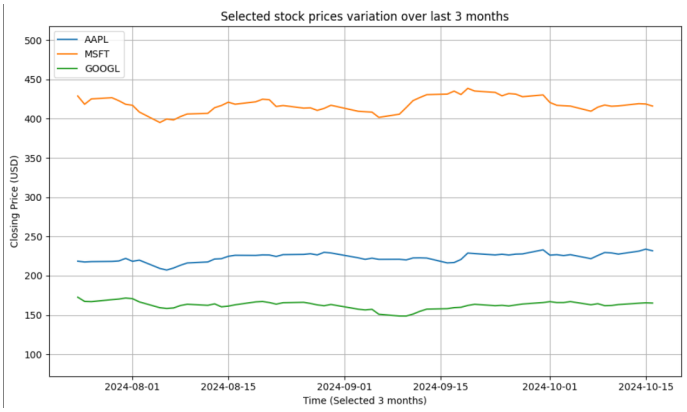

Figure 3: Line chart trend for Stock Price for Apple, Google and Microsoft (Last 3 months)

This chart shows the closing stock prices of Apple (AAPL), Microsoft (MSFT), and Google (GOOGL) over the past three months. The y-axis displays the closing price in USD, while the x-axis marks the time period from August 2024 to October 2024. Each company's performance is plotted as a line, giving a clear view of the stock price trends during this period. While the chart provides a straightforward comparison of the stock prices, the title may exaggerate the performance, as the stocks remain relatively stable without any significant growth spikes. We can clearly observe that the stock prices doesn't show any significant growth or decline over the last 3 months, is it actually a case over the year as well?

For 12 Months

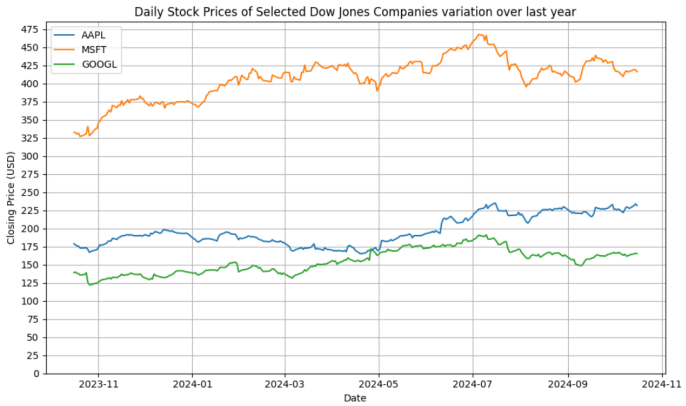

Figure 4: Line chart trend for Stock Price for Apple, Google and Microsoft (Last 12 months))

This chart shows the daily closing stock prices for Apple (AAPL), Microsoft (MSFT), and Google (GOOGL) over the past year. The y-axis represents the stock prices in USD, and the x-axis shows the dates from November 2023 to November 2024. It gives a clear view of how the stock prices of these companies have changed throughout the year, showing differences in their growth and stability.

But after analysing the graphs and reading their descriptions, can you find out which figures are Earnest and which are deceptive? lets find out.

Finding out Earnest and Deceptive visualisations

1. **Figure 1 is Earnest visualisation.**. This chart is effective because it uses different colors to clearly represent each company's data, making it easy to tell Apple (AAPL), Microsoft (MSFT), and Google (GOOGL) apart. The data points are easy to read and follow, with lines that clearly show changes over time. The axis labels are straightforward, with the x-axis showing months and the y-axis displaying percentage changes, allowing viewers to quickly grasp the trends. The overall design is simple and easy to understand, with a clean layout that keeps the focus on the data.
2. **Figure 2,This stacked area chart is deceptive** because it distorts individual contributions by stacking data, making it difficult to see how each company performed on its own. Additionally, it only highlights positive changes, ignoring any negative changes over time, which creates a misleadingly optimistic view of performance. For someone unfamiliar with cumulative addition, the chart might falsely suggest that Google (stacked at the top) has the largest contribution in certain months, when in reality, its actual impact may be much smaller compared to other companies. The visual weight of the company at the bottom (Apple) also exaggerates its influence. Overall, the chart misleads by magnifying positive performance, masking volatility, and confusing viewers about each company's true contribution. However these shortcomings can be improved as the stacked area chart, the data could be displayed using individual line or area charts for each company, making it easier to see their performance separately. Negative changes should also be included to avoid presenting an overly optimistic view. Clarifying how cumulative addition works or using an alternative format like a grouped bar chart would prevent misinterpretation. Additionally, adjusting the visual weight and using distinct colors would help ensure that no company's contribution is exaggerated.
3. **Figure 3 is Deceptive**. The 3-month chart provides a misleading perspective of stock price movements for a few key reasons. First, the y-axis is set with a wide range (150 to 500 USD), which minimizes the appearance of price changes. This compresses the data, making it look like there is almost no fluctuation, when in reality, there are clear shifts in the prices during this period. When the same 3-month span is viewed in the 12-month chart, the fluctuations are far more visible, giving a more accurate depiction of stock performance. Second, the 3-month chart suggests minimal changes in the stock prices, misleading viewers into thinking that the market has been steady, even though the longer-term data shows more activity. Finally, focusing on just the last 3 months creates a false impression of stability, as it ignores the broader context and volatility seen in the longer-term view, which gives a clearer picture of the true market trends. Together, these elements make the 3-month chart appear deceptively calm and less volatile than it actually is. However it can be simply improved by shortening the y-axis scale so that it can show the deviations in a better way.
4. **Figure 4 is Earnest visualisation.** This chart is a good example of an earnest visualization because it effectively displays the daily stock prices for Apple (AAPL), Microsoft (MSFT), and Google (GOOGL) over the past year. Each company's stock is represented by a different color, making it easy to differentiate between them. The y-axis is properly scaled to show the full range of stock prices, from around 100 to 475 USD, and the x-axis provides clear date labels to track changes over time. There is no data manipulation, and the chart presents the stock prices as they naturally occurred without distortion. It also highlights trends, such as Microsoft's steady rise and Apple and Google's fluctuations, making it a transparent and easy-to-understand representation of the data. Overall, this chart is clear, unbiased, and reliable.

Conclusion

Figure 1 is considered an earnest visualization because it uses clear color coding and straightforward axis labeling to make it easy to understand stock trends for Apple, Microsoft, and Google. Figure 2 is identified as deceptive due to its stacked area chart format, which distorts individual company contributions, ignores negative changes, and misleadingly amplifies positive trends. Figure 3 is also called deceptive for using a broad y-axis that minimizes visible fluctuations and suggests false stability, even though longer-term data shows more activity. Finally, Figure 4 is described as another earnest visualization that clearly represents the daily stock prices of the companies over a year, offering an unbiased, transparent view of market trends.