



Stock Analysis Report

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Executive Summary

This data analysis paper examines the complexities of the stock market, utilizing advanced data processing tools to extract meaningful insights from extensive datasets. Throughout the exploration of the stocks contained in the dataset I identify the top twenty best and worst performing stocks providing direct evidence to the dynamic and nuanced nature of financial markets. Notably, the analysis highlights three different stocks and examines their profitability and reliability. The emphasis being on the stocks Spotify Technology S.A. (SPOT), SilverSun Technologies, Inc. (SSNT), and Virgin Galactic Holdings, Inc. (SPCE), and examining the factors that contribute to their perceived market success or failure. Beyond the specifics of individual stocks, this paper underscores the broader application of data processing in financial analysis and its distinct impact on decision-making processes. Data processing tools emerge as a critical skill for extracting actionable insights and staying competitive as organizations continue to navigate a data-drive marketplace. In summary, this paper will serve as a valuable resource for those seeking an informed understanding of stock market dynamics, offering a glimpse into specific stock performances, a broader appreciation for the role of data processing tools in modern financial analysis, and allowing the data scraping techniques learned and applied throughout this project to be repurposed for other datasets.

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Introduction

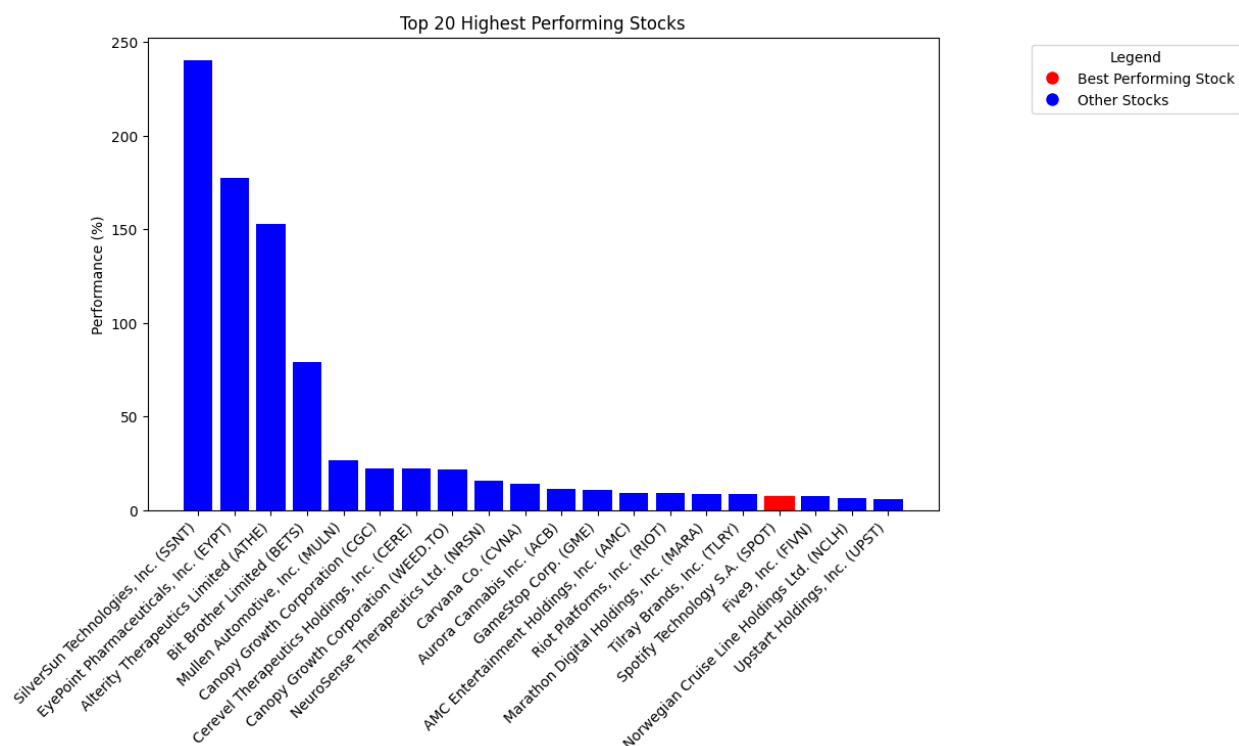
In the continuously evolving landscape of financial markets one thing remains true and consistent: information is key. Data driven insights play a vital role in helping to influence investment decisions by individuals playing in the stock market. Throughout this report I will delve into an analysis of stock market data, seeking to uncover trends, patterns, or valuable information that can aid investors, analysts, enthusiasts, and myself. Through utilizing advanced data processing techniques and visualization tools, I aim to provide a comprehensive overview of the market dynamics during the observed period. My analysis encompasses a diverse range of stocks, exploring their performance, market changes, and key indicators for positive and negative trends. The dataset used in the analysis offers a variety of information including stock prices, market change percentages, and additional metrics that offer a nuanced understanding of the market's behavior. By leveraging Python programming, Pandas, and Matplotlib, I have processed and visualized this data, distilling complicated patterns into accessible and insightful charts that can aid in stock market predictions and past activity. Through employment of the various data analytic techniques learned throughout this Data Processing course, it will allow better understanding and interpretation of the data presented, helping us to make key decisions regarding market behavior. With this data I sought to answer two key questions regarding the stocks evaluated including: which stock proved to be most reliable/profitable and which stock proved to be least reliable/profitable? It is important to note that the data scraped is particular to the day it was gathered, meaning the analysis conducted on the information queried during my initial scraping, will of course differ from data gathered on a different day. Meaning that this analysis is only applicable in respect to the day in which the information was collected.

Data

The data within this report was scraped using Python and various libraries to aid in the endeavor. The information is pulled from the website Yahoo! Finance and contains basic information regarding the stock desired. This would include data such as the stock name, market price, market change (dollar-wise), Market change (percent-wise), yesterday's market close, today's market open, today's market range (low - high), and the number of available share on the market. It is important to note that the values provided within the csv file were taken Monday, December 4th, 2023. This is important because when the scraping tool is run it will override the current market_data.csv file and save the current prices of the stocks when the tool is run. When attempting to read the data into a database and leverage its full applications, it often proved difficult to analyze the data due to the varying symbols and punctuation that threw off the program, because of this the data is manipulated in a way that allows us to use the data without compromising its contents. This is particularly evident in the market change percent data column. To remedy this, I read the data in as a string, removed the percentage sign, converted it to a float, and added a data label. This allowed me to fully utilize the data with no errors when attempting to implement the information in data analysis tool. Furthermore, these data scraping and analysis tools can be reused and repurposed to examine other stocks and important information, allowing this tool and its applications to go far beyond the scope of an academic report. The actual stocks chosen for evaluation are simply hard coded into a list and then once the program is run it gets the necessary data for the desired stock and saves the output to a csv file titled 'market_data.csv' with an output message saying the data was successfully written and the number of lines the data wrote. Due to this, additional stocks can be added or subtracted depending on the users' desires enabling a reusable and relevant data analysis tool for stock market analysis.

Data Analysis

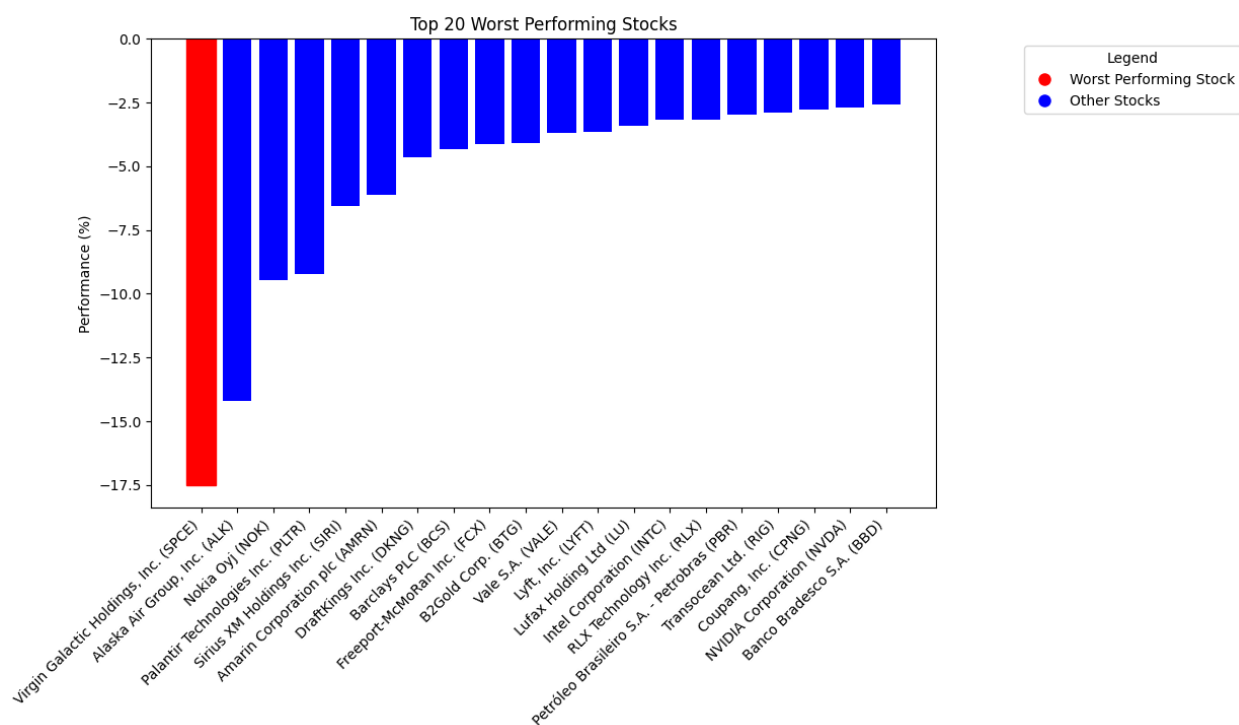
In attempting to better understand the stock market, my analysis begins with meticulous examination of individual stock performances. The fundamental question that guided my research was: “Which stock stood out as the best performer during the observed period?” In this particular case the best performer would encompass profitability and reliability. To aid in addressing this question I used a data-focused approach utilizing Python and its libraries for a more robust and visual analysis. My data set with multiple metrics regarding a stock allowed me to discern complex trends into easily accessible visualizations. My research led me to create a visual bar chart where each stock’s performance was distinguished with a distinct color. The top performer was highlighted with a bold red color, creating a clear focal point for investors and analysts. The chart aided in showcasing the best performing stock but also provided a comparative view of the top 20 stocks in the market.



This chart highlighted the single best-performing stock but simultaneously showcased a spectrum of high-performance stocks, each contributing to the dynamic market landscape. The actionable insights derived from this analysis extend beyond a singular stock, allowing myself and investors to explore a diversified portfolio of potential opportunities.

In contrast, I scrutinized the opposite end of the spectrum, aiming to identify the stock that faced the most significant challenges during the observed period and thus answering the question:

“Which stock stood out as the worst performer during the period?” The chart provides a contrasting view to the success stories by showcasing the worst-performing stocks, discernable with the same legends, axis, and colors.



After conducting this in-depth analysis, I not only was able to determine which stocks would be a good investment with the top twenty stock, but I was also able to shed lights on areas of caution by providing the same analysis of the twenty worst performing stocks. Being able to

visualize the data provided a nuanced understanding of market dynamics and allowed me to feel more empowered in decision making regarding decisions based on understanding of individual stock performances. As I continue throughout this report, the following sections will examine in deeper specification how these results were reached and their implications.

Results Interpretation

The bar chart depicting the top twenty best-performing stocks provides a visual narrative of the market's high achievers. Each bar in the graph represents a specific stock, with the standout performer marked in a distinct red color. This chart provides valuable insight into the market dynamics and enables investors to identify potential winners/losers and optimize their portfolio. Taking a closer look at Spotify Technology S.A. (referred to as SPOT from here onward), we see that it was designated the best performing stock despite not having the largest positive market change percent. At first glance it can be easy to designate SilverSun technologies Inc. (referred to as SSNT from here onward) as the single best-performing stock simply due to its incredibly high market change percent. However, analyzing the performance of stocks goes far beyond a single metric, and there are various nuanced factors contributing to determining whether a stock is considered better performing. Now in this specific case of SPOT and SSNT, despite SSNT having a higher market change percentage, several other factors contribute to SPOT being considered the best-performing stock.

Stock Name	Market Price	Market Change	Market Change Percent	Previous Close	Market Open	Market Range	Market Share Volume Available
SilverSun Technologies Inc. (SSNT)	12.49	8.82	240.33%	3.67	8.29	6.48 - 13.37	41,446,592
Spotify Technology S.A. (SPOT)	194.17	13.48	7.46%	180.69	193	192.00 - 201.41	6,833,293

Some of the factors to consider are SPOT's absolute performance; SPOT has a positive market change percentage of 7.46% indicating a consistent upward trend in its value during the observed period. This positive performance is significant to investors seeking stability and growth in their portfolios. Another important factor to consider is the stocks' closing price, which is a direct indicator of the stocks' established position. SPOT's closing price is substantially higher than SSNT's closing price of \$12.49. The absolute value of the closing price reflects the market's evaluation of the stock so the higher the ending stock price, the more confidence there is in that particular stock. In addition to the previous factors listed, the price range, which is the fluctuations from low-high of the stock price that day, of SPOT is rather narrow but substantial in price with a range of \$192 - \$201.41. In contrast SSNT's price range is wider and lower at \$6.48 - \$13.37. Understanding these ranges is critical when considering the stock because a narrow price range indicates more stability and trust in the stock whereas a wider range of course means more volatility and potential fluctuations in price. These alone are a good indicator that SPOT is considered the more reliable and profitable stock, but for insurance purposes we will continue to compare ulterior stock metrics. Market capitalization, the total number of shares times the share price, is a critical factor in determining the profitability of a stock. When this analysis is conducted on the two competing stocks it is crystal clear which stock has the higher market evaluation with SPOT being valued at \$1,326,820,501.81 and SSNT stock being valued at \$517,667,934.08; this provide further credibility to the claim that SPOT was the best performing stock despite not having the largest positive market change percentage. Finally, a less accounted for variable in a stock profitability is societal influence, and while no one can predict what societal implications will have on the stock market, we can do our best to try. Considering the industry and market position would be vital in this aspect, SPOT is a much more well-known

technology-company in the music streaming industry and is more than likely perceived by the general public as having a stronger market position than that of SSNT, which is a smaller company in the technological sector. For the simple fact that Spotify is a more household name, it may influence investors to be more confident in the stock and thus enabling profitability in a sort of paradoxical effect (because you think a stock is profitable, you invest and thus make the stock more profitable). To summarize, the evaluation of stock performance involves a comprehensive analysis of various metrics, and the choice of what dictates a “better performing” stock greatly depends on the investor’s objectives and risk tolerance. While SSNT may have a more substantial market change percentage, SPOT’s culmination of positive performance, higher absolute value, stability, and market interest places it in a better position as a better-performing stock in the context of the data analyzed.

Conversely, the chart highlighting the twenty worst-performing stocks illuminates potential downfalls and risks within the market. Each bar signifies a stock facing challenges with the worst-performing stock accentuated for clarity. Virgin Galactic Holdings, Inc. (referred to as SPCE from here onward) emerged as the worst-performing stock marked by its distinct red color.

Stock Name	Market Price	Market Change	Market Change Percent	Previous Close	Market Open	Market Range	Market Share Volume Available
Virgin Galactic Holdings, Inc. (SPCE)	1.93	-0.41	-17.52%	2.34	1.98	1.9200 - 2.1300	27,751,496

The negative market change percentage of -17.52% underscores a decline in value during the stock's observed period. SPCE's closing price of \$1.93 reflects a substantial decrease and lack of confidence in the stock. Furthermore, this claim is supported by the price range of the stock with a low of \$1.92 and a high of \$2.13, the price of the stock directly reflects the trust and profitability of the stock and is a clear indication that this is a failing stock utilizing today's data. To further examine SPCE's poor performance we must scrutinize the fundamentals of the stock's metrics. This means the negative market change percentage signals a loss in value, which, purely speculating, could be a result of adverse market conditions, internal challenges, or external factors impacting company operations; nevertheless, the stock performed the worst due to factors out of our data analytical scope. Due to this, investors should exercise caution and conduct additional due diligence before considering all stocks, but especially SPCE. To summarize, the top twenty worst-performing stocks chart serves as a risk management tool, aiding investors and myself in identifying stocks with potential downsides and steering clear of underperformers. Both of these statistical interpretations give evidence to the power of visualizations in sifting through complex data and turning them into actionable insights, guiding investment decisions based on a nuanced understanding of each individual stock performance.

Conclusion

In conclusion, aiding investors in the valuable insights and dynamics of financial markets allows us to better understand the market with comprehensive analysis of stock market data. Data processing tools and techniques have allowed us to navigate extensive datasets, conduct exploratory data analysis, and generate visualizations to uncover patterns and trends. The significance of tools deployed in this analysis cannot be overstated, they have allowed us to efficiently handle large volumes of data, clean and reprocess information, and derive meaningful metrics for interpretation. Helping us in determining top and worst performing stocks it is evident that data processing tools have streamlined the analytical process, enabling us a deeper understanding of the marketspace. Furthermore, the applications of the data processing tools utilized in this report and acquired from CIS 3389 – Data Processing, extend beyond the realm of a simple stock market analysis. In various industries, these tools allow organizations to extract actionable insights from complex datasets, optimize operations, and enhance decision-making processes. The ability to harness data and use its knowledge to enable businesses, researchers, and policymakers is a transformative force aiding in navigating an increasingly data-driven world. As I conclude this analysis report, it is obvious that data processing tools now serve as indispensable assets for those seeking to exploit the data within large datasets. The insights derived from this contribute to the broader understanding of market behaviors and economic trends and enable the individual to formulate informed decisions. In today's modern era where data is abundant, proficiency in leveraging that data becomes a key competency for applying knowledge and staying ahead in a dynamic and competitive marketspace.

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