INTERNSHIP PROJECT REPORT

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Internship Organization: Unified Mentor

Project Title: Stock Market Analysis Using Tableau

Domain: Business Analyst

Tools Used: Tableau Desktop, Microsoft Excel

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1. Introduction

In today's fast-paced financial world, understanding how major tech companies perform in the stock market is essential for making smart investment and business decisions. This project focuses on analyzing and comparing the stock performance of four leading technology giants Apple, Microsoft, Netflix, and Google. Using powerful data visualization tools like Tableau, along with Excel and SQL, we dig deep into historical stock data to uncover meaningful patterns and trends.

Our analysis goes beyond just looking at prices. We explore how each company's stock has moved over time, identify trends and fluctuations, and even measure the volatility of their performance. By doing so, we aim to gain valuable insights into how these companies behave in the market and how they relate to one another. We also calculate moving averages and conduct correlation studies to better understand the relationships between their stock prices.

This project is not just a technical exercise it's about turning complex financial data into clear, visual stories that can help investors, analysts, and business leaders make more informed decisions. Through interactive dashboards and clean visuals, the goal is to present stock market insights in a way that is both engaging and informative.

2. Objective

- Identify trends and price movement patterns in the stock data to understand how each company's performance has evolved over time.
- Calculate key metrics such as moving averages and volatility to assess the consistency and risk levels associated with each stock.
- Perform correlation analysis to explore how the stock prices of Apple, Microsoft, Netflix, and Google are related to one another.
- Design and build interactive dashboards using Tableau to present insights in a clear and visually engaging manner for easy interpretation.

3. Tools Used

- **Tableau Desktop**:
  Used as the primary data visualization tool to create interactive charts, graphs, and dashboards. Tableau helped simplify complex stock data into meaningful visual insights, making it easier to identify patterns, correlations, and market behaviors across the selected companies.

- **Microsoft Excel**:
  Utilized for initial data cleaning, formatting, and transformation. Excel enabled efficient handling of raw stock data such as removing missing values, standardizing date formats, and calculating additional fields like daily returns or percentage changes.
- **SQL (Structured Query Language)**:
  Applied for querying and managing large datasets when combining or filtering data from multiple sources. SQL helped ensure that only the relevant and accurate data points were imported into Tableau for analysis.

4. Dataset

The dataset used in this project consists of historical stock price data for four major technology companies: Apple (AAPL), Microsoft (MSFT), Netflix (NFLX), and Google (GOOGL). It covers daily stock information such as opening and closing prices, highest and lowest prices of the day, trading volume, and date-wise records over a period of approximately three months.
The dataset provides a solid foundation for conducting time-series analysis, calculating statistical indicators like moving averages and volatility, and exploring relationships between different company stocks. For users interested in expanding the project, the same data can also be accessed or updated using financial data APIs such as **Yahoo Finance** or **Alpha Vantage**.

Dataset: https://drive.google.com/file/d/1D7dXnkkxsJo-rDyOMfv5xTypp99Rp2p0/view?usp=sharing

5. Methodology

The methodology followed in this stock market analysis project is structured into five comprehensive phases each tailored to ensure accurate data handling, insightful analysis, and effective visualization. These steps collectively enabled a deeper understanding of the stock performance of Apple, Microsoft, Netflix, and Google.

1. Data Collection

The dataset was sourced from a publicly shared Google Drive link in CSV format.

It contains historical daily stock price information for four technology giants: Apple (AAPL), Microsoft (MSFT), Netflix (NFLX), and Google (GOOGL).

Each data entry includes attributes such as Date, Open Price, Close Price, High, Low, Volume, and Company Name.

Additional external data, such as market news and global indices, were referenced for context and interpretation.

2. Data Cleaning and Preparation

Microsoft Excel was used for initial inspection and formatting of the dataset.

All missing values, duplicates, and inconsistencies were identified and removed.

Columns were renamed for clarity and consistency across tools.

Derived fields were calculated, such as:

Daily Returns = (Close – Open) / Open

% Change = ((Current Day Close – Previous Day Close) / Previous Day Close) × 100

7-Day Moving Average to smooth short-term fluctuations.

The cleaned dataset was saved in a Tableau-compatible format (.CSV) for seamless import.

3. Data Integration into Tableau

Tableau Desktop was used to connect the refined CSV dataset.

Data types were validated (e.g., dates recognized correctly, prices treated as numerical values).

Calculated fields were created directly in Tableau where required, such as volatility, moving averages, and rolling volume averages.

Data blending and filtering options were configured to enable comparisons between companies and over time.

4. Exploratory Data Analysis & Visualization

With Tableau's powerful drag-and-drop interface, the following key visualizations were created:

Time-Series Line Charts: Visualized stock prices over time for each company, helping spot trends, spikes, or dips.

Moving Average Line: Highlighted smoothed trends to remove noise and improve clarity in long-term movement.

Volume Charts: Bar charts showing daily trading volumes, used to identify periods of high investor activity.

Volatility Representation: Plotted standard deviation of price changes to visualize which stocks showed the most fluctuation.

Correlation Heatmaps: Showed how closely the stock prices of these companies moved together.

Scatter Plots with Trendlines: Compared daily returns between pairs of companies (e.g., Apple vs. Google).

Interactive Filters: Enabled viewers to explore individual stocks, specific time periods, or comparative analysis dynamically.

5. Dashboard Development and Presentation

A central dashboard was developed in Tableau by combining all major charts and analyses.

It was designed with a user-friendly layout, clean formatting, and responsive filters to explore data interactively.

The dashboard included:

Drop-down filters for selecting company and date range.

Tooltips to display exact data values and comparisons.

Annotations highlighting important market events or anomalies (e.g., sudden price drops).

Legends and labels to ensure accessibility and ease of understanding.

6. Review and Interpretation

After developing the dashboard, an interpretive review was conducted to derive insights.

Patterns such as consistent growth, sudden volatility, or correlated movements were identified and noted.

Each visualization was reviewed to ensure it directly contributes to the objective of understanding market performance.

Suggestions and improvements were also documented for future iterations of the project.

6. Insights

After analyzing the stock market data for Apple, Microsoft, Netflix, and Google, several meaningful insights were drawn from the visualizations and statistical indicators developed in Tableau. These insights help understand the behavior of each stock, their relationship with one another, and their potential implications for investors and analysts.

1. Performance Trends

Apple (AAPL) and Microsoft (MSFT) demonstrated steady and relatively predictable price trends over the selected time frame.

These two companies showed consistent growth, with fewer fluctuations, indicating strong investor confidence and stability in performance.

In contrast, Netflix (NFLX) exhibited significant ups and downs, reflecting higher sensitivity to market events such as earnings announcements or external news.

2. Volatility Analysis

Among the four companies, Netflix showed the highest volatility, with large daily price swings and rapid changes in momentum.

Google (GOOGL) displayed moderate volatility not as stable as Microsoft, but more controlled than Netflix.

Volatility analysis helped identify which stocks are riskier in the short term and which are safer for long-term investors.

3. Correlation Between Stocks

Apple and Microsoft stocks were strongly correlated, meaning they often moved in similar directions on the same days.

This is likely due to their similar market positioning and mutual influence from broader tech sector movements.

Netflix showed a weak correlation with the others, indicating that it is influenced more by internal factors or media-specific industry trends.

4. Volume and Market Activity

The trading volume spiked significantly for all companies around specific dates, such as quarterly earnings reports or market news announcements.

Apple had the highest consistent trading volume, followed by Microsoft, suggesting strong investor interest and active participation.

5. Moving Averages and Price Trends

The 7-day and 14-day moving averages smoothed out daily fluctuations and helped clearly highlight upward or downward trends.

Microsoft and Apple maintained a gradual upward trend, whereas Netflix showed irregular movement around its average line.

These averages acted as useful indicators for identifying potential buying or selling points.

6. Interactive Dashboard Utility

The interactive filters and drop-downs in Tableau allowed a dynamic exploration of the data.

Users could isolate one company, compare two companies side by side, or observe how a specific time period impacted all four stocks.

This interactivity enhanced the ability to draw insights quickly and intuitively.

7. Conclusion

This project provided a comprehensive analysis of the stock market performance of four leading technology companies **Apple, Microsoft, Netflix, and Google** using tools such as Tableau, Excel, and SQL. By transforming raw financial data into insightful visualizations, we were able to uncover trends, assess volatility, measure performance, and explore correlations between stocks.

The visual dashboards built in Tableau enabled clear comparisons and made it easier to understand complex market behaviors. Key performance indicators such as moving averages, percentage change, and daily returns were visualized to evaluate company strength and market reaction over time.

The analysis revealed that **Apple and Microsoft are relatively stable stocks with strong correlations**, while **Netflix displayed higher volatility**, making it a more risk-sensitive investment. **Google exhibited moderate patterns**, standing between consistent and volatile behavior.

This project not only enhanced technical skills in data handling and visualization but also deepened the understanding of real-world financial analysis. It demonstrated the importance of data-driven decision-making in stock market investments and opened the door for applying similar methods to other companies or industries in the future.

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8. Future Scope

1. **Expand the Dataset**

- Include a broader range of companies across different sectors such as healthcare, energy, or automotive to provide a more diverse market perspective.
- Analyze a longer time period such as one year or five years to identify long-term trends and patterns.

2. Real-Time Data Integration

- Integrate **live data feeds** using APIs such as **Yahoo Finance**, **Alpha Vantage**, or **Google Finance** to build a real-time dashboard.
- Enable automatic updates and real-time alerts for sudden stock changes or market movements.

3. Predictive Analytics and Machine Learning

- Apply **time-series forecasting models** like **ARIMA**, **Prophet**, or **LSTM** to predict future stock prices based on past performance.
- Use **machine learning algorithms** to classify stock behavior, identify buy/sell signals, or cluster similar companies.

4. Sentiment and News Analysis

- Combine stock data with **news headlines, tweets, or financial reports** to perform sentiment analysis and study how public perception affects stock performance.
- Visualize how certain keywords or events impact volatility and price direction.

5. Macroeconomic Integration

- Add external indicators such as **interest rates, inflation, GDP growth, and global indices (e.g., NASDAQ, S&P 500)** to understand their influence on tech stocks.
- Correlate economic trends with company-specific performance to derive more insightful conclusions.

6. Enhanced Dashboard Functionality

- Build **mobile-friendly dashboards** or **embed them into websites** for broader accessibility.
- Introduce user personalization features, such as saved filters or scenario-based simulations (e.g., “What if Netflix drops 5% in a day?”).

7. Portfolio Simulation

- Add a portfolio tracker where users can simulate investments in multiple stocks and track hypothetical gains/losses over time.
- Visualize diversified portfolios and compare returns based on allocation strategy.

9. References

1. **Dataset Source**

Google Drive (Provided Link):
https://drive.google.com/file/d/1i7Too9BOI6-A2QdfPsqGi2CzID09fVLE/view?usp=sharing

2. **Dashboard Inspiration & Sample**

Tableau Public:
Stock Market Dashboard – Srikant Alphonsus

3. **Financial Data Sources**

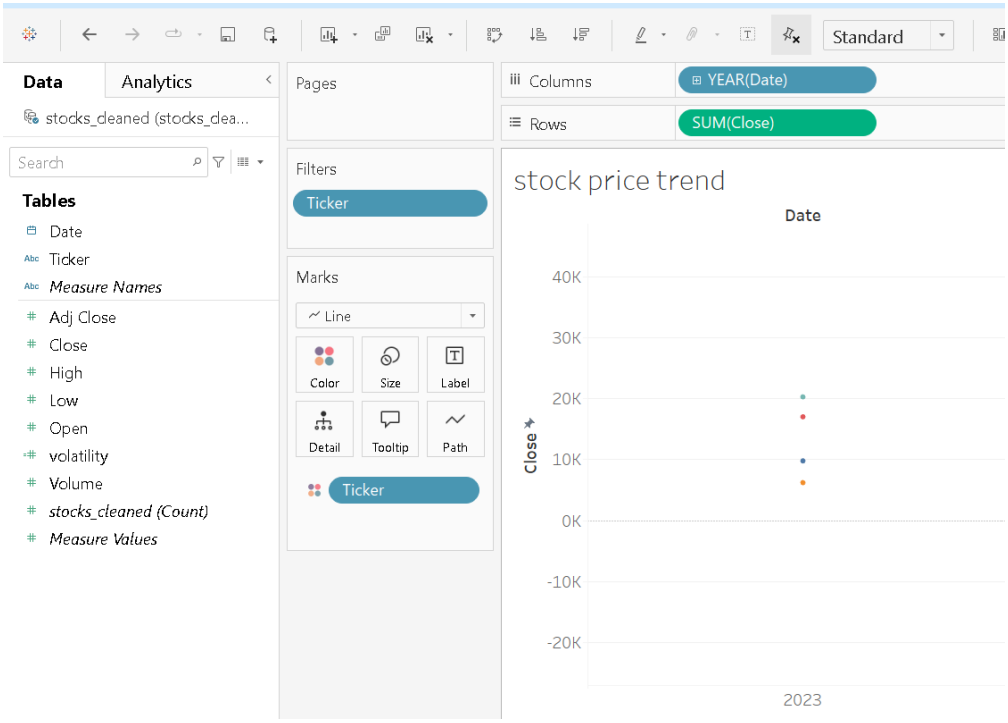
Yahoo Finance: https://finance.yahoo.com
Google Finance: https://www.google.com/finance
Alpha Vantage API: https://www.alphavantage.co

4. **Tools Used**

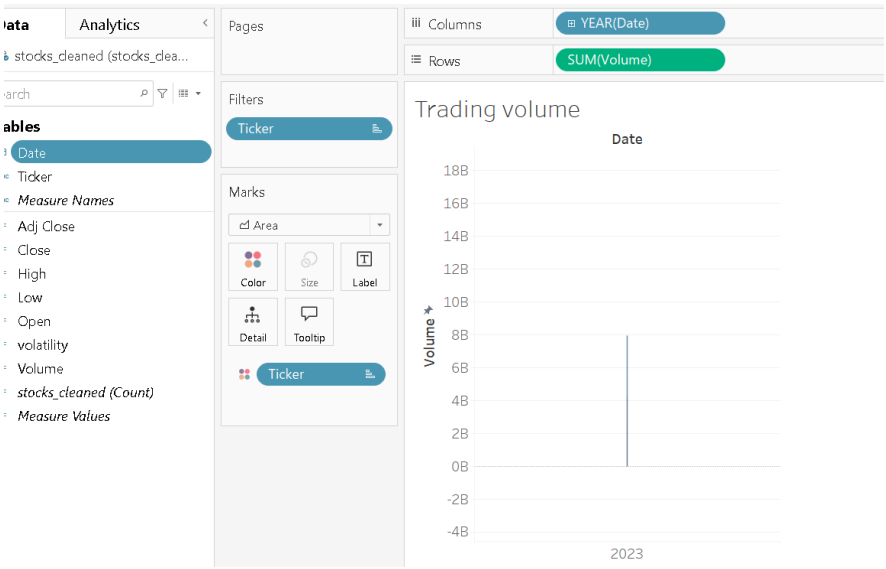
Tableau Desktop: https://www.tableau.com
Microsoft Excel: https://www.microsoft.com/en-us/microsoft-365/excel

Tableau work:

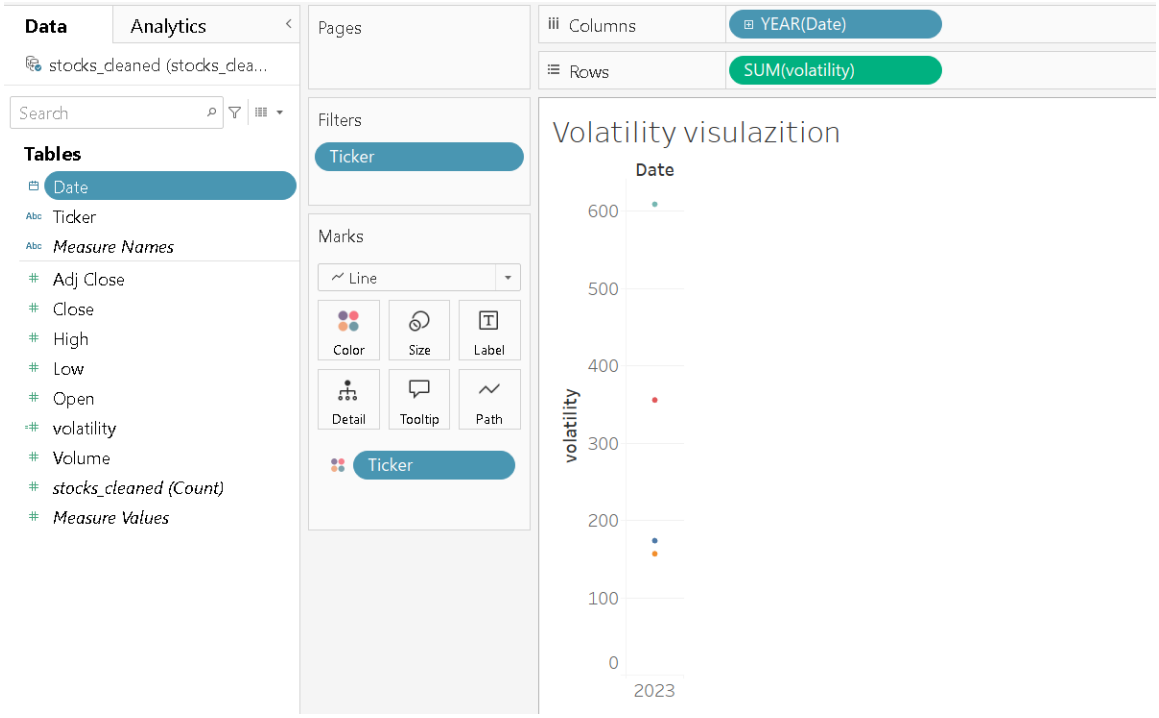
- stock price trend:



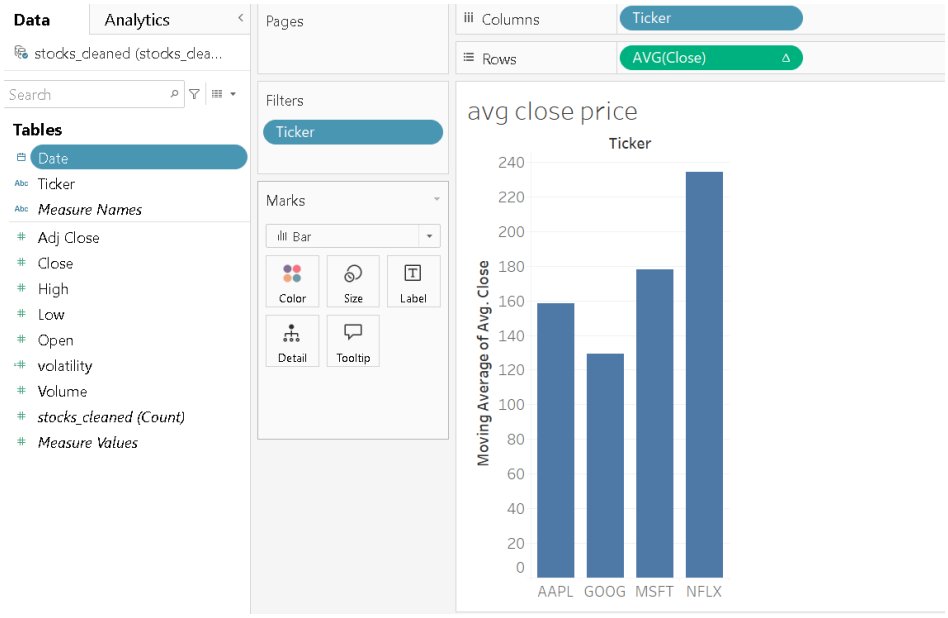
- Trading volume:



- Volatility visulazition:



- avg close price:



- Stock market analysis: