

Stock Performance Dashboard: A Comparative Analysis of Top Tech Companies (2013-2023)

ASU Data Analytics Bootcamp - Project 3 - Data Visualization Track

Presented by Team 4:

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AGENDA



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Project Overview / README

- Purpose and Functionality
- Why Does This Project Matter?
- How To Use The Dashboard

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Investment Strategies & Team Investor Profiles

- Conservative or Aggressive?
- Balance or Growth?

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Game Time: Which investment Strategy would YOU chose in 2013?

- Investor Options
- Visualization Review (based on investment strategies / filtered data)
- Announcement of the Winner 

4

The Winner Has Been Announced. Now what...?

- Insight & Analysis
- Conclusions, Solutions, & Impact
- Ethical Considerations

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FAQS, References, & More

- Data Sources & References
- Disclosure & Limitations
- Project Management Reference
- Questions & Comments?
- Thank you!

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Project Overview:
Interactive Tech Stock Dashboard

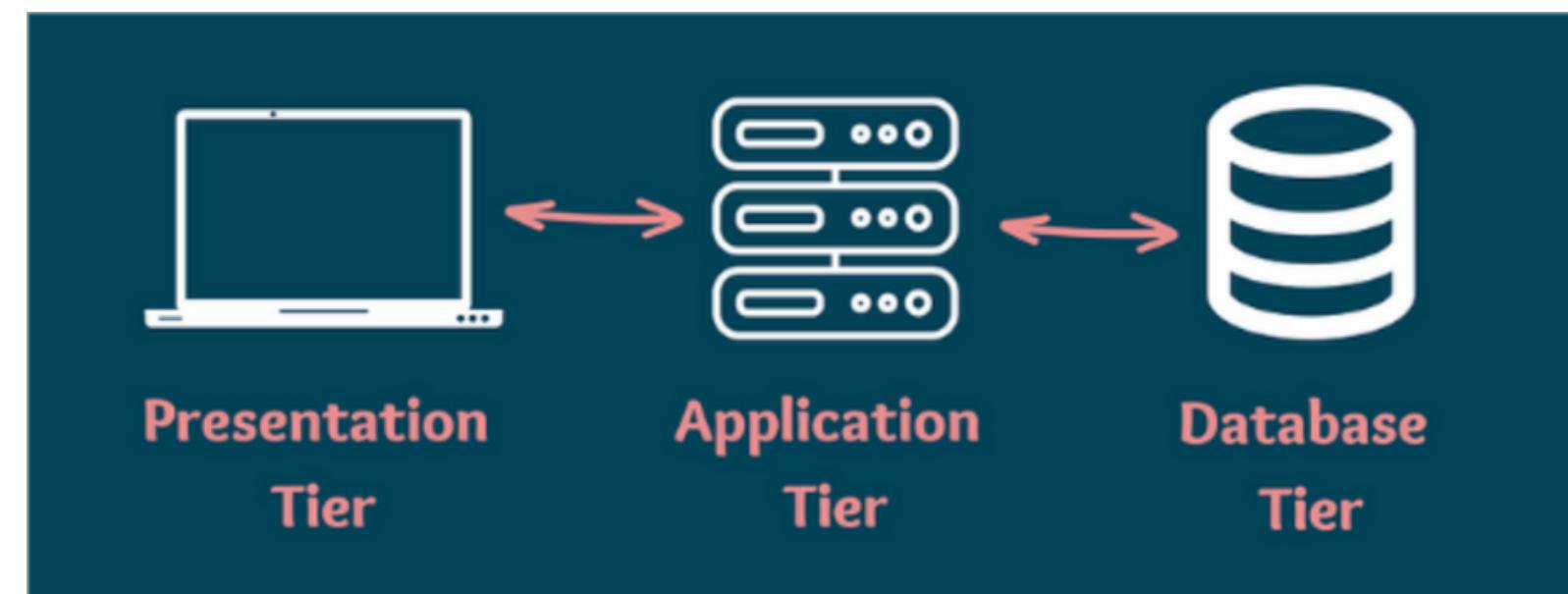
This project proves an interactive dashboard
that visualizes the performance of top
technology companies for a ten year period
(01/01/2013 - 12/31/2023).

| COMPANY NAME | STOCK TICKER |
|-------------------|---------------------|
| Apple | AAPL |
| Tesla | TSLA |
| Microsoft | MSFT |
| Netflix | NFLX |
| Meta | META (FKA Facebook) |
| Alphabet / Google | GOOG |
| NVIDIA | NVDA |

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Project Overview: Purpose and Functionality

- Purpose: Analyze and compare the historical performance (from January 1st, 2013, to December 31st, 2023) of seven prominent tech companies.
- Data: Utilize external public APIs (through RapidAPI) to fetch closing stock prices for each company.
- Visualization: Present the data in a user-friendly dashboard using HTML, CSS, and JavaScript.
- Key Feature: Compare the performance of two stocks in a single graph.
- Charting: Employ the charting library Plotly to create a line graph that visually represents the performance trends of all seven companies.



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Project Overview: Why Does This Project Matter?



The Challenge of Complex Stock Data Analysis

- Understanding historical stock data, particularly for non-financial professionals, can be a significant hurdle. This complexity stems from several factors:
 - Information Overload: Financial data is often presented as raw numbers and technical charts, requiring interpretation and financial knowledge.
 - Limited Accessibility: Detailed investment analysis tools can be expensive or require financial expertise, limiting access for many individuals.
 - Growing Interest in Tech Stocks: While technology stocks are a popular investment choice, comparing their performance over time can be challenging for casual investors.

Our Approach: Simplifying Data Through Analytics

- Our project addresses these challenges by leveraging data analytics to create an interactive data visualization tool. This tool simplifies complex data in several ways:
 - Clear Visualizations: We present the data in an easy-to-understand format with clear charts and graphs.
 - Interactive Dashboard: Users can explore the data, filter information, and compare different tech stocks.
 - Contextualization: Features like simulated investment growth make the data relatable and help users understand the potential impact of different investment decisions.

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Project Overview: Why Does This Project Matter?



Investor Profiles: Tailored Insights

Our project goes beyond data visualization by incorporating investor profiles. These profiles consider factors like risk tolerance and investment goals to provide users with a more personalized experience.

- Matching Risk & Goals: Provides examples of risk tolerance and investment goals (e.g., growth, income).
- Interactive Simulations: Users can experiment with different investment strategies by simulating how a hypothetical investment of \$1,000 in 2013 would perform in 2023 based on their chosen stocks.
- Impact on Net Worth: These simulations showcase the potential impact of different investment strategies on a user's net worth over time, providing a tangible example of how investing can grow wealth.

This personalized approach empowers users to make informed investment decisions based on their unique financial situation and goals.

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Project Overview: How To Use The Dashboard User Interaction & Visualization - Example 1

- User can select each stock type and use interactive filter features to capture the data they wish to review, allowing for stock analysis based on company and/or date
- User can hover over the stock performance within the chart to see the stock price in a given month



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Project Overview: How To Use The Dashboard User Interaction & Visualization - Example 2

- User can select each stock type and use interactive filter features to capture the data they wish to review, allowing for stock analysis based on company and/or date
- User can hover over the stock performance within the chart to see the stock price in a given month



Investment Strategies & Profiles: Conservative, Aggressive, Balance, Growth

IPSITA



DREW



JUAN



Siobhan



Conservative

- Focus: Preserving capital and minimizing risk.
- Investments: Low-volatility assets like bonds, CDs, dividend-paying stocks, or index funds.
- Goals: Steady, reliable growth over high returns. Suitable for those nearing retirement or with a low risk tolerance.
- Risk Tolerance: Low. They prioritize protecting their principal investment over potentially higher gains.

Aggressive

- Focus: Maximizing potential returns and capital appreciation, even with higher risk.
- Investments: Growth stocks, small-cap stocks, options, newer markets.
- Goals: Significant long-term gains that potentially outpace the market average. Suitable for young investors with a long investment horizon and a high tolerance for risk.
- Risk Tolerance: High. OK with short-term fluctuations in exchange for the possibility of substantial growth.

Balanced

- Focus: Achieving a balance between growth and risk.
- Investments: A mix of stocks and bonds (allocation depends on risk tolerance). Some cash equivalents for liquidity
- Goals: Long-term capital appreciation, Steady and predictable growth, Moderate risk tolerance
- Risk Tolerance: Moderate. Willing to accept some market volatility for the potential for higher returns.

Growth

- Focus: Investing in companies with high growth potential, even if they are not yet profitable.
- Investments: Startups, technology companies, emerging markets.
- Goals: High returns driven by rapid company growth and potential market dominance.
- Risk Tolerance: High. Growth stocks can be volatile, and there's a chance the company might not succeed.

The Two Stocks our investors selected in 2013 - Whose Team Are You On?

IPSITA



Conservative

- Two Tech Stocks Selected:
 - Microsoft (MSFT)
 - Apple (AAPL)
- Why These Two Stocks?
 - Microsoft: well-established tech giant with a long history of profitability and consistent dividend payouts.
 - Apple: major player with a strong brand and a loyal customer base.

DREW



Aggressive

- Two Tech Stocks Selected:
 - Tesla (TSLA)
 - Netflix (NFLX)
- Why These Two Stocks??
 - Tesla: electric vehicle market was still nascent, and Tesla's success was far from guaranteed.
 - Netflix: streaming was new. The company was facing competition, but high potential for growth.

JUAN



Balanced

- Two Tech Stocks Selected:
 - Google (GOOG)*
 - Microsoft (MSFT)
- Why These Two Stocks?
 - Both companies were established players.
 - Moderate Risk/Reward: While not the highest-growth options, they offered the potential for growth alongside some stability compared to riskier tech startups in 2013.

Siobhan



Growth

- Two Tech Stocks Selected:
 - Nvidia (NVDA)
 - META (META)
- Why These Two Stocks?
 - High-Growth Potential: Both companies were in industries with significant growth potential.
 - Disruptive Technologies: Both companies were involved in technologies that could disrupt established industries.

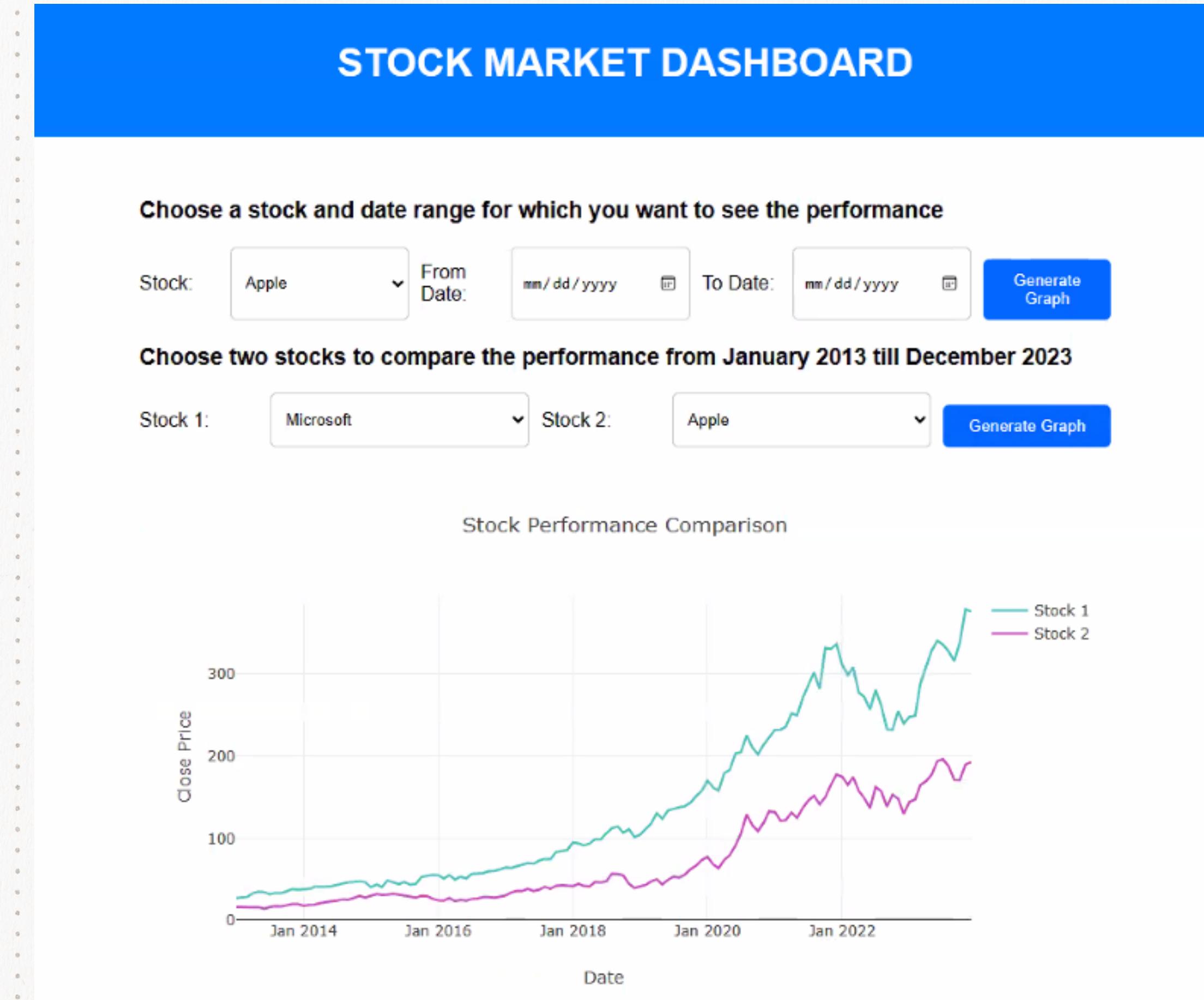
Ipsita's Investment Results - Conservative Approach

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Conservative

- Two Tech Stocks Selected:
 - Microsoft (MSFT)
 - Apple (AAPL)



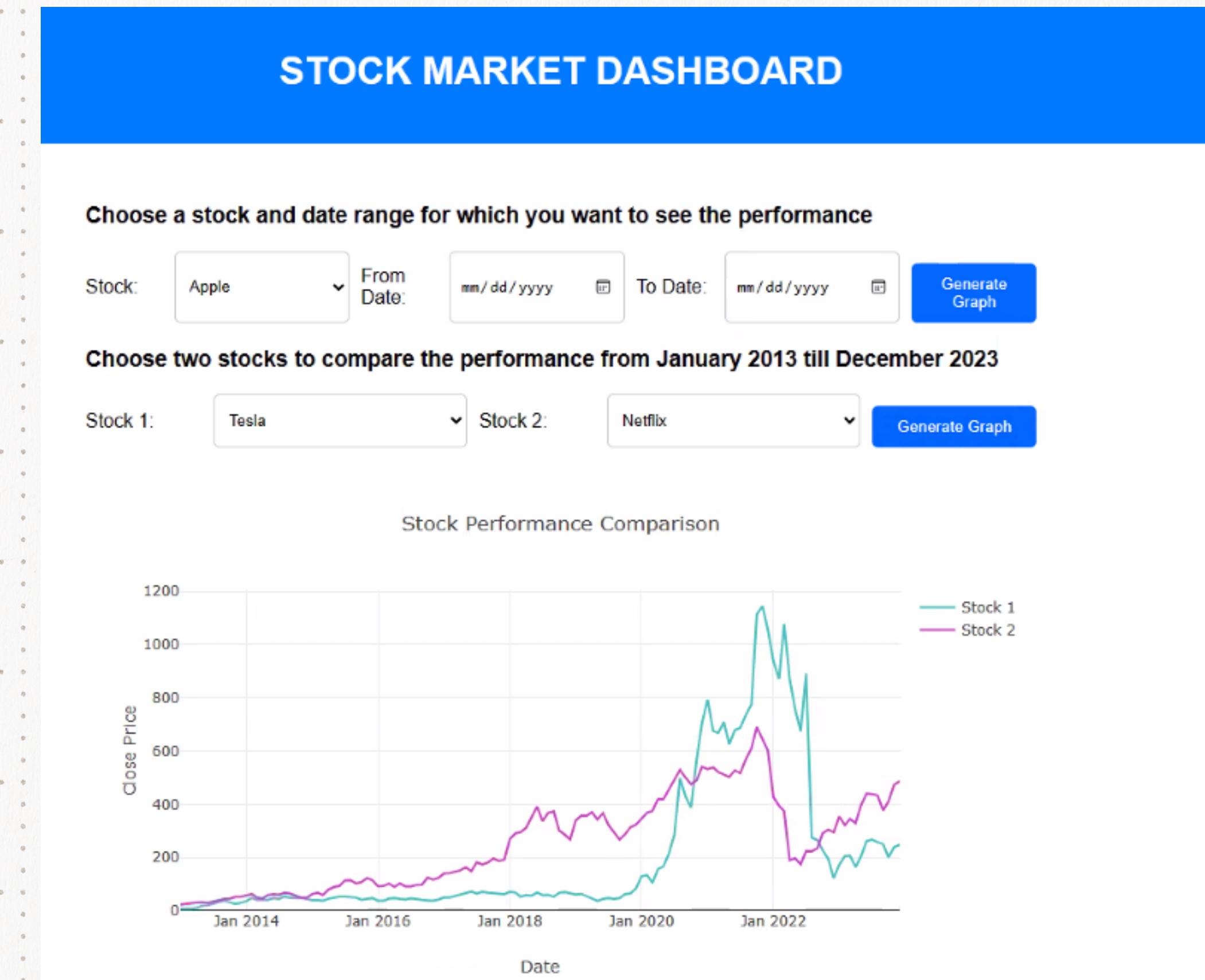
Drew's Investment Results - Aggressive Approach:

DREW



Aggressive

- Two Tech Stocks Selected:
 - Tesla (TSLA)
 - Netflix (NFLX)

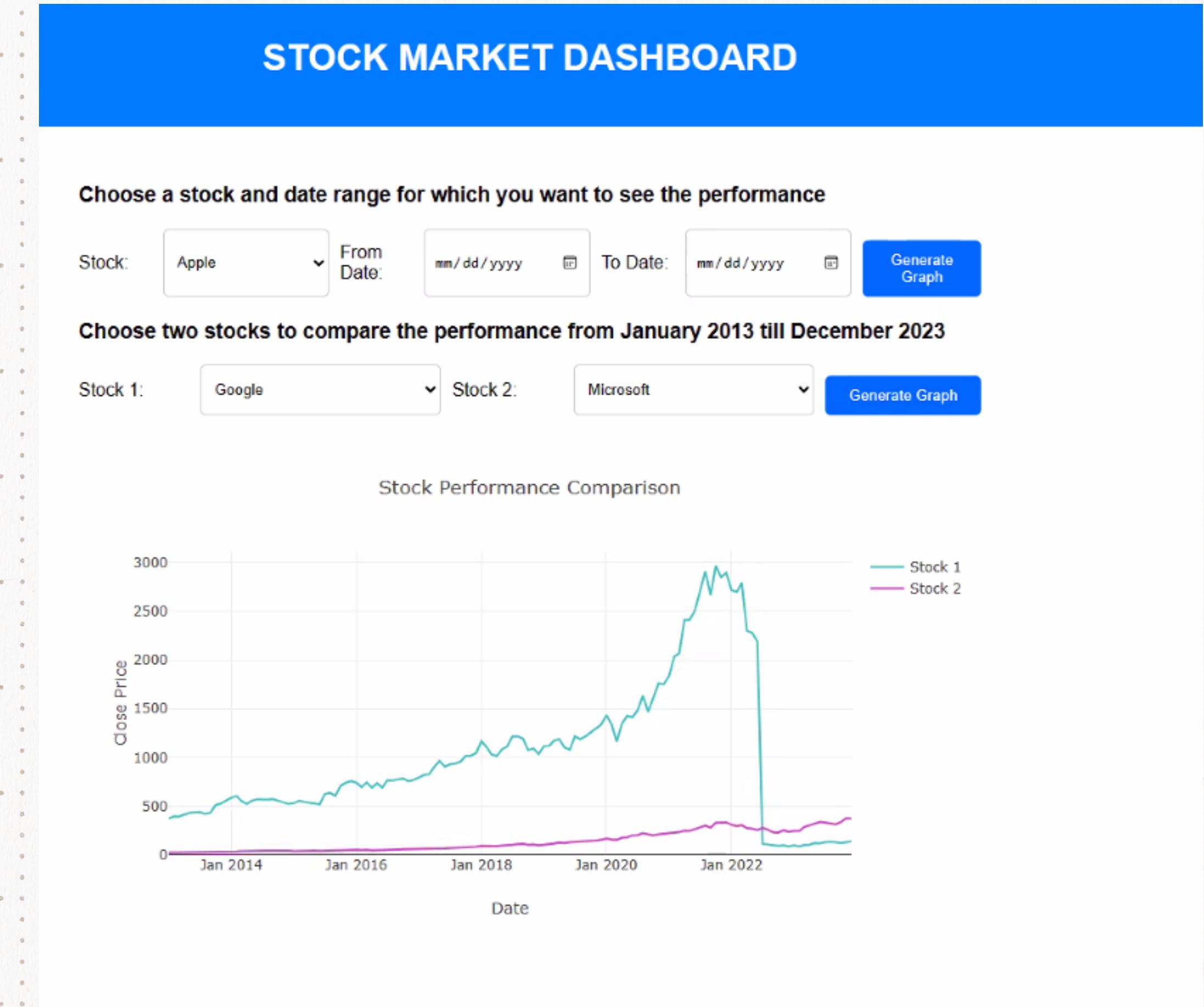


Juan's Investment Results - Balanced Approach:



Balanced

- Two Tech Stocks Selected:
 - Google (GOOG)*
 - Microsoft (MSFT)



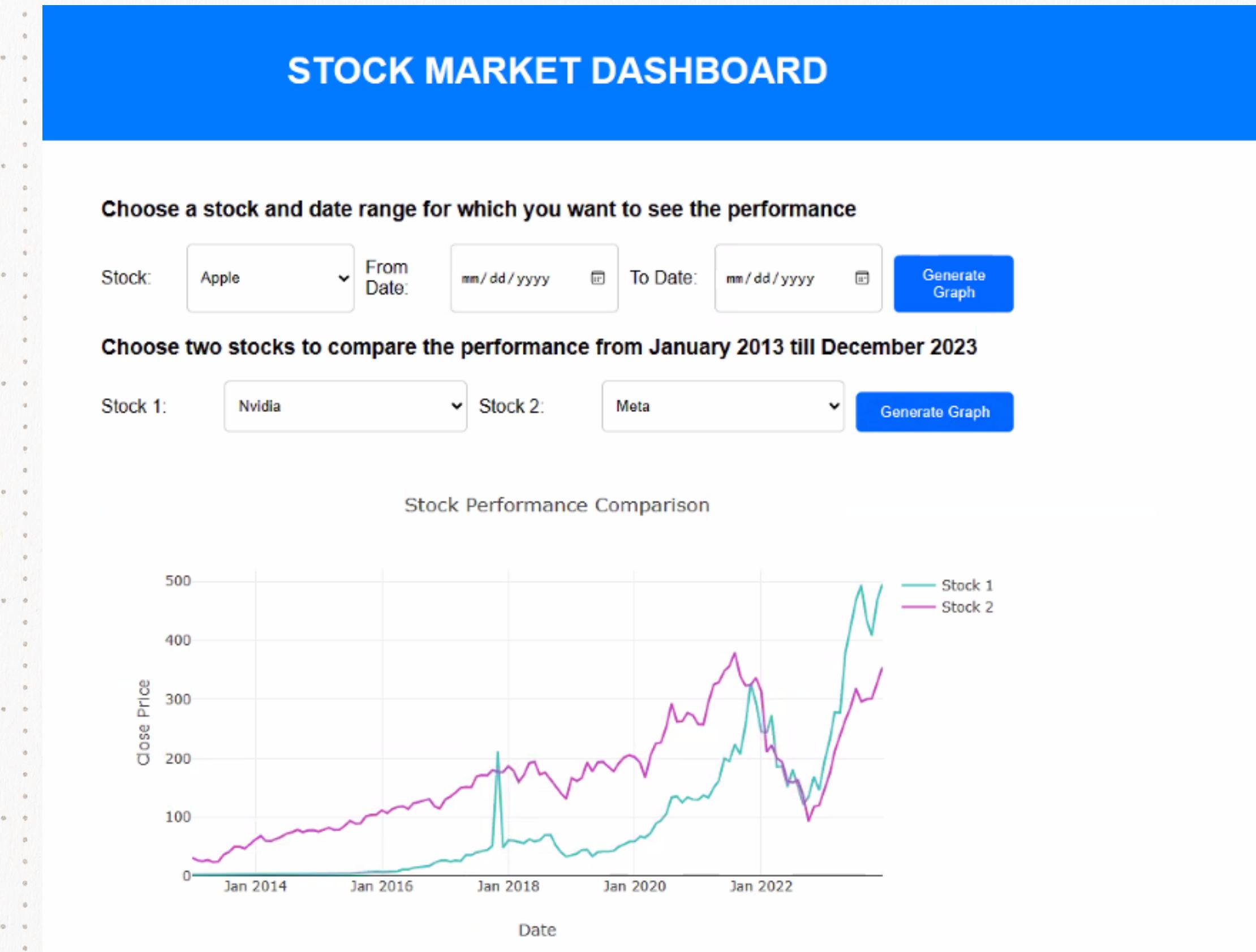
Siobhan's Investment Results - Growth Approach:

Siobhan



Growth

- Two Tech Stocks Selected:
 - Nvidia (NVDA)
 - META (META)



The Investor That Generated The Highest Return is....



Investment Results

- Siobhan is still working on this

IPSITA



Conservative

- Ipsita's outcome was:
 - Microsoft (MSFT)
 - Apple (AAPL)
 - Merged increase of \$524.83
 - **\$524,830.00**

DREW



Aggressive

- Drew's outcome was:
 - Tesla (TSLA)
 - Netflix (NFLX)
 - Merged increase f \$704.25
 - **\$704,250.00**

JUAN



Value

- Juan's outcome was:
 - Google (GOOG)*
 - Microsoft (MSFT)
 - Merged increase of \$113.09
 - **\$111,090 * See explanation**

Siobhan



Growth

- Siobhan's outcome was:
 - Nvidia (NVDA)
 - META (META)
 - Merged increase of \$815.14
 - **\$815,140**

Analysis & Conclusion



Investment Strategies

It is important to understand what you are investing in and your risk tolerance. In our example, it can result in over \$500,000 difference in net worth, however, it can also result in substantial losses which are not captured in this analysis.

Result:

Siobhan's Growth Approach resulted in the highest return of \$1,000. The second highest return was the Aggressive strategy. Granted, one of the riskier choices, and would not be ideal for some people, such as those nearing retirement.

Historical Analysis:

Holding both of the stocks for 10+ years resulted in a net positive growth for all investors. It also highlights the importance of investing in the stock market, as early as possible. By diversifying your portfolio, it can decrease your risk exposure, but also your potential for growth.

Conclusion

What is YOUR investment style!?



Risk vs. Return

- This is a fundamental principle in investing. Investors look for a balance between the potential return on their investment and the risk of losing money. Higher potential returns typically come with higher risk, and vice versa.

Investment Time Horizon

- Knowing how long you plan to hold onto your investment is crucial. Short-term goals might call for lower-risk options, while long-term goals can afford to ride out market fluctuations and potentially benefit from higher-risk investments.

Diversification

- Don't put all your eggs in one basket! Spreading your investments across different asset classes (like stocks, bonds, and real estate) can help mitigate risk. If one area of the market performs poorly, others may hold steady or even grow.

Investment Fees

- Fees can eat into your returns over time, so it's important to be mindful of them. Consider factors like expense ratios for mutual funds and ETFs, or commissions for stock trades.

Financial Goals

- What are you investing for? Retirement? A down payment on a house? Your specific goals will influence the types of investments you choose. Consider the opportunity cost when investing.



Ethical Considerations



Our project prioritizes responsible investment education through data analysis.

- Here's how we addressed key ethical considerations:
 - Open Data Transparency: We leverage openly available historical stock data sources commonly used for educational purposes. We disclose these sources and ensure data accuracy through cleaning and verification processes.
 - Historical Performance Disclaimer: We acknowledge that past performance doesn't guarantee future results. Our simulations are for educational purposes only and should not be considered financial advice.
 - Investor Profile Limitations: We emphasize that investor profile recommendations are based on historical data and general risk categories. Users should conduct further research before making investment decisions.
- While using openly available data sources for educational purposes and acknowledging potential biases in those sources, algorithmic bias, and limitations like stock splits and company name changes, our project prioritizes ethical considerations like data transparency, historical performance disclaimers, and responsible use of investor profiles to empower informed investment decisions.
- All images used are either available for free use and/or property of Canva and may not be reproduced (contact Canva). No pictures of content was obtained from the internet, other than disclosed.

FAQs / Limitations / Disclosures



Data Limitations and Considerations:

Data Anomalies:

- Stock Splits: Our data set might not accurately reflect stock splits (e.g., GOOG*). This can skew performance data, particularly for Google in our example.
- Company Name Changes: We strive to represent companies accurately, but historical data might reflect previous names (e.g., Meta wasn't established in 2013).
- Investor Perception Shifts: While we consider historical data, investor perception of companies can change over time (e.g., tech stock risk tolerance).

Data Availability:

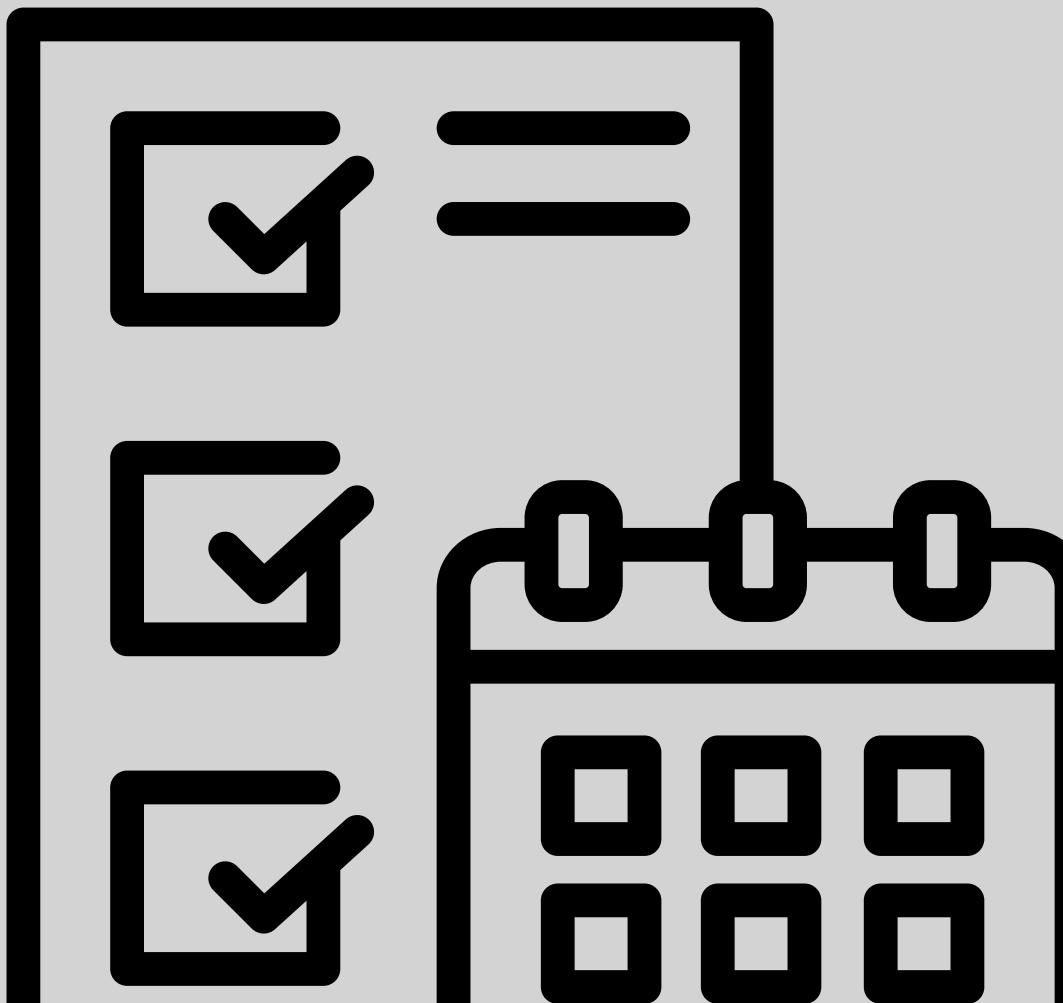
- Company Lifespan: Our initial focus on 2000 data was limited by company lifespans. We pivoted to 2013-2023 while maintaining a significant data set (100+ points).
- Publicly Traded Focus: We focused on publicly traded companies in 2013, potentially excluding relevant companies that went public later.
- Limited Scope: Our project focuses on tech stocks, potentially limiting its applicability to all investment goals.

Disclosure:

- AI was used including Chat AI bots, etc.
- Tutoring was accessed for specific project related issues
- This presentation and project are for educational purposes only and should not be constituted as financial advice or relied upon

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Project Overview: Project Management / Timeline



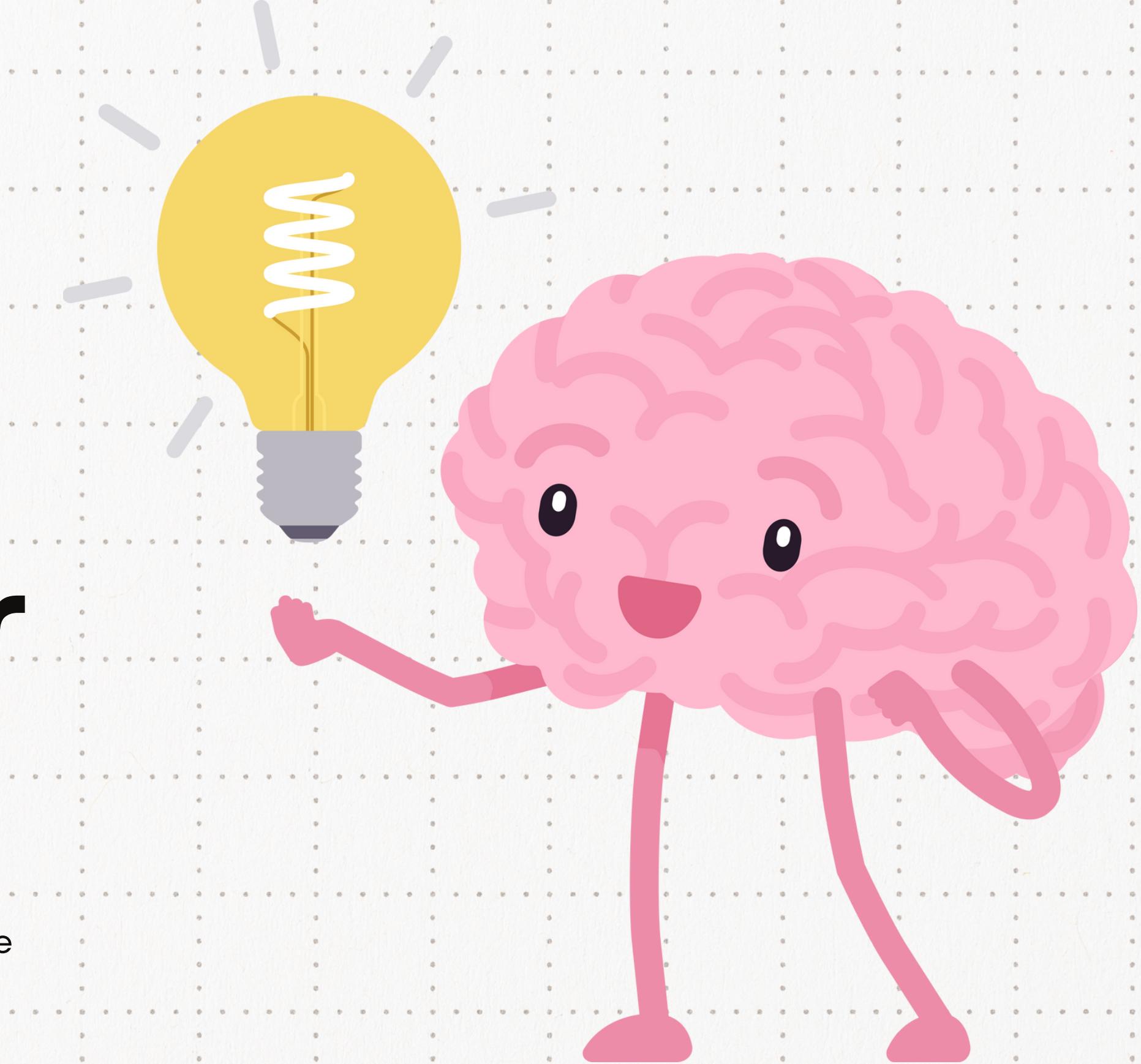
| SI No | Task Title | Sub tasks | Start Date | End Date | Status |
|-------|---|--|------------|-----------|-----------|
| 1 | Project kick-off | Ideation Project identification Project finalization through discussion with team members | 4/4/2024 | 4/4/2024 | Completed |
| 2 | Github Repo creation | Create 3 branches | 4/5/2024 | 4/6/2024 | Completed |
| 3 | Prototype preparation | Prepare a prototype of the project Update readme file | 4/5/2024 | 4/6/2024 | Completed |
| 4 | Data collection / extraction | Pull JSON data through URL - https://rapidapi.com/api4stocks/api/apistocks | 4/5/2024 | 4/6/2024 | Completed |
| 5 | Data preparation | Data extraction from public API load into MongoDB (No SQL DB) | 4/6/2024 | 4/7/2024 | Completed |
| 6 | Development and coding | Individual modules to be divided among team members | 4/8/2024 | 4/12/2024 | Completed |
| 7 | Validation and testing | Testing individual modules! Integration testing Smoke testing Regression testing | 4/15/2024 | 4/17/2024 | Completed |
| 8 | Project completion and final presentation | Presentation of individual modules | 4/18/2024 | 4/18/2024 | Planned |

Questions? Comments?

Thank you for your time!

... and remember!

Don't miss out on free money! Contribute at least the employer match amount into your 401k today!



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