Introduction

This project began with a personal interest: my older brother introduced me to the world of stocks and finance, and I quickly became fascinated by how the market moves—and how much of it is driven by perception, momentum, and major players like NVIDIA. I wanted to understand it all more deeply, but I also wanted to do more than just read articles or watch videos. So, I used the technical skills I've developed in Python and Dash to explore the stock market through a tool I could build myself.

The result is this interactive dashboard: a blend of financial analysis, data visualization, and education. Throughout the process, I not only learned a lot about the market itself, but I also discovered how much I enjoy bridging technical tools with business insights. This project helped clarify something big for me—I'm not just interested in tech; I'm interested in using tech to support smarter decisions, clearer communication, and meaningful impact in business contexts.

What I've Learned

This project has deepened my skills in both technical development and data storytelling. Through building this dashboard, I've gained:

- Experience structuring a multi-file Dash application, including separating logic into callbacks, visuals, and layout files for scalability and readability.

- A better understanding of financial concepts, including how to normalize stock data, interpret correlation, and analyze real-world earnings impacts.

- Confidence working with messy data—from cleaning and combining CSVs to simulating volume data and aligning time series for multiple companies.

- Stronger frontend intuition, especially around creating interactive, user-friendly components like dropdowns, sliders, and dynamic markdown.

- The importance of visual clarity and educational design, especially when translating technical content for users who might be new to investing or data analysis.

Most importantly, I've learned how powerful data visualization can be when paired with real-world relevance and thoughtful design. Seeing how a stock like NVIDIA actually "moves the market" became clearer the more I built, iterated, and explored.

Price Trends Tab – Compare Stock Growth Over Time

The *Price Trends* tab allows users to compare the percentage-based growth of NVIDIA's stock alongside other major companies and market indices. By normalizing stock prices to 100, this visualization emphasizes **relative growth** rather than raw price—making it easy to see how dramatically NVIDIA has outpaced competitors like AMD, Intel, and Microsoft over time.

Users can interactively select which companies to display and adjust the time window using a range slider. Vertical dashed lines mark NVIDIA's quarterly earnings dates, offering context for sudden spikes or drops. This tab is designed to highlight NVIDIA's market influence and illustrate how external events—like earnings reports—correlate with movement in both its own stock and the broader tech sector.

Findings

- **NVIDIA showed significantly higher relative growth** than any other company in the dataset, at one point exceeding **1500% growth** since January 2023 when normalized to 100.

- Major spikes in NVIDIA's stock growth consistently **aligned with quarterly earnings reports**, highlighting the market's strong response to its financial performance and guidance.

- In contrast, companies like Microsoft, Intel, and Dell showed **modest, steady growth**, while AMD and SuperMicro experienced some volatility but remained well below NVIDIA's trajectory.

- The S&P 500 and NASDAQ indices remained relatively flat in comparison, reinforcing the idea that **NVIDIA is outperforming the broader market by a wide margin**.

- The data suggests that **NVIDIA acts as a market mover**, often setting trends for tech-sector momentum around key dates.

- **SuperMicro briefly surpassed NVIDIA in relative growth** during early 2024, likely due to market hype or speculative momentum, but its gains were short-lived as the stock eventually declined and stabilized below NVIDIA's trajectory.

NVIDIA Focus Tab – NVIDIA's Market Trajectory

The *NVIDIA Focus* tab provides a detailed look at NVIDIA's raw stock price movements from early 2023 to late 2024. Unlike the normalized view in the previous tab, this visualization shows actual price values in USD, allowing users to track NVIDIA's growth in absolute terms. A dropdown menu enables users to zoom into specific **earnings report weeks**, helping them observe how the market reacted in the days surrounding each report.

Below the price chart, a **simulated volume chart** visualizes trading activity during selected time windows. This section was designed to help users explore the relationship between **price volatility and volume surges** during high-impact events like earnings announcements.

Findings

- NVIDIA's stock price increased from just over **$100 to nearly $800** over the course of less than two years—a striking growth rate in raw dollar terms.

- Large price jumps often **coincided with earnings weeks**, particularly those in **May 2023, November 2023, and February 2024**, suggesting strong market optimism around NVIDIA's financial results and projections.

- Zooming into specific weeks reveals short-term **volatility spikes**, with notable dips or rallies occurring in the 2–3 days immediately following earnings.

- The simulated volume bars reinforce this pattern, indicating that **trading activity was elevated** during these key periods—signaling widespread investor response.

Learn About Stocks Tab – Understand Key Stock Terms

The *Learn About Stocks* tab serves as an interactive glossary for users who may be new to investing or want to deepen their financial literacy. By selecting a term from the dropdown menu, users can view a concise explanation broken into four parts:

- **What It Is:** A basic definition of the stock term

- **Why It Matters:** Context on how the term is used in trading or analysis

- **How to Use It:** A practical application tip

- **Fun Fact:** A real-world example, often tied to NVIDIA's stock behavior

This tab is designed to demystify key concepts like opening price, closing price, volume, and adjusted close—making the rest of the dashboard more approachable and educational.

Findings

- Users frequently confuse terms like **adjusted close** and **closing price**, even though they represent different values—this tab helps clarify those differences with context and examples.

- NVIDIA's stock provides relevant real-world use cases for almost every concept. For example, its **Q2 2023 earnings report** triggered a new **intraday high**, which is explained under the *Highest Price* definition.

- By embedding examples and "fun facts" drawn directly from actual market behavior, this tab reinforces learning through **relatable, applied definitions**—a powerful strategy for financial education.

Company Deep Dive Tab – Learn About the Key Players in the Market

The *Company Deep Dive* tab provides users with a snapshot of key companies in the tech and semiconductor industries. By selecting a company from the dropdown, users can quickly learn:

- **What the company does** (its core business or industry role)

- **What it sells** (its main product lines or technologies)

- **Why it matters** (its relevance to the market or relationship to NVIDIA)

The tab is structured for quick, digestible comparisons between NVIDIA and its competitors, such as AMD, Intel, Microsoft, and others. It helps users understand not just what these companies are, but **how they influence and interact with NVIDIA's growth and the broader market**.

Findings

- Companies like **AMD and Intel** are direct competitors in the GPU and chip space, which means their performance and product innovation often affect investor confidence in NVIDIA as well.

- Including context on each company helps users interpret correlation trends seen in other tabs, like the heatmap or price comparisons.

- By offering a clear breakdown of each company's **core offerings and market role**, the tab supports better-informed comparisons for users newer to the tech sector.

Next Steps

While the current version of the dashboard offers strong educational and analytical tools, there are several features I hope to implement in the future to expand its depth and usability:

- **Live Data Integration:** Replace static CSV files with real-time stock data using APIs (e.g., Alpha Vantage or Yahoo Finance API) for up-to-date analysis.

- **Sentiment Analysis:** Add a feature that pulls headlines or earnings call transcripts and applies natural language processing to gauge market sentiment.

- **Financial Literacy Quiz:** Create a short, interactive quiz under the "Learn About Stocks" tab to reinforce user learning in a fun, engaging way.

- **Stock Comparison Filters:** Allow users to filter and group companies by sector, market cap, or performance tier when comparing in the Price Trends tab.

- **Custom Earnings Events:** Enable users to add or upload their own earnings dates or significant market events for more personalized insights.

- **UI/UX Enhancements:** Refine mobile responsiveness, add subtle animations, and include onboarding tooltips for first-time users.

These additions would further enhance the dashboard's ability to educate, inform, and engage users—whether they're students, casual investors, or curious learners.