

**COS30045 – Data Visualization**

**NVIDIA Stock Price Analysis and Visualization**

**Ta Nam Khanh**

**Ha Duc Trung Kien**

**Luong Anh Cuong**

1. **Introduction**

* Project Purpose: This project aims to analyze and visualize historical stock prices for NVIDIA Corporation, identifying trends and potential insights for investors.
* Objectives:
* Explore NVIDIA stock price trends over time.
* Develop interactive data visualizations to provide clear insights into stock movements.
* Utilize historical data for potential trend identification and market analysis.
* Target Audience: This project primarily serves financial analysts, stock market enthusiasts, and NVIDIA investors seeking historical trends and patterns.

1. **Project Planning**

* Timeline:
* Week 8: Gathering datasets, Project planning and setup (GitHub, Communication channels, Shared documents).
* Week 9: Research and understand the datasets. Start designing the visualisation
* Week 11 - 12: Development of data visualizations and working on report drafts.
* Week 13: Finish the Implementation of key features and continued testing.
* Week 14: Finalise the project, documentation, and preparing for submission
* Meeting schedule:
* Time: Every Friday, 3:00 PM - 4:00 PM  
  Day: Weekly on Fridays
* Roles & Responsibilities:
* Ta Nam Khanh: Conducts data analysis, prepares insights, and creates visualizations.
* Luong Anh Cuong: Handles backend development, data processing, and database integration.
* Ha Duc Trung Kien: Coordinates project tasks, manages documentation, and compiles the report.

1. **Methodology**

* Data Source: Historical NVIDIA stock price data was sourced from Kaggle
* Data Preprocessing:
* Loaded data and handled missing values by [e.g., removing or interpolating missing data points].
* Normalized date formats and standardized price fields (e.g., adjusted close, opening prices).
* Analysis Approach:
* Conducted preliminary analysis, calculating moving averages, volatility, and daily returns to understand stock trends.
* Prepared data for visualization by summarizing monthly and yearly price trends.
* Technologies Used:
* Frontend: HTML, CSS, and JavaScript for building the web interface.
* Backend: Nodejs for data processing and API development.
* Data Visualization: Libraries like Matplotlib or D3.js to create charts and interactive graphs.

1. **Design Choices**

* Interface Design: Emphasized a clean layout for easy navigation through stock data visuals.
* Color Scheme: Used a neutral color scheme to enhance readability and focus on data.
* Data Visualization Types: Candlestick charts for daily trading activity.

1. **Challenges and Solutions**

* Data Gaps: Encountered missing values in certain dates. Solution: Applied linear interpolation to fill missing points.
* High Variability in Stock Data: Stock prices showed high volatility, complicating trend analysis. Solution: Used moving averages to smooth data and highlight trends.
* Integration Challenges: Issues with rendering large datasets in visualization libraries. Solution: Limited displayed data range and optimized loading for improved performance.

1. **Results and Analysis**

* Summary of Findings:
* Identified periods of significant growth and decline in NVIDIA's stock price, correlating with major market events.
* Observed consistent trends that may indicate seasonal or annual cycles in the stock performance.
* Data Insights:
* The analysis highlighted key periods of NVIDIA's stock price volatility, useful for assessing investment timing.
* Visualization of moving averages provided a smoother view of stock trends, useful for longer-term analysis.
* User Feedback: Initial feedback from users indicated that the visualizations were intuitive and valuable for understanding NVIDIA's stock performance.

1. **Results and Analysis**

* Lessons Learned:
* Data cleaning and preprocessing are essential for reliable analysis.
* Visualization design significantly impacts user understanding, especially with financial data.
* Areas for Improvement:
* Further improve data loading speeds for larger datasets.
* Explore additional financial indicators (e.g., RSI, MACD) to enhance stock trend analysis.
* Future Work:
* Expand analysis to include comparisons with industry peers.
* Integrate real-time stock data for a live price tracking feature.