

## Project Proposal

### 1. Project Name: Stock Price Trend Analysis

Member: Khang Thai

### 2. What problem are you trying to solve:

The prices of stocks can sometimes be very unpredictable and hard to understand, especially for new and casual investors. There are many aspects that have influence in prices of stocks daily like market behavior, investor sentiment, economic events, and company performance. By collecting and analyzing historical data, we will be able to understand how a stock's price changes over time, how volatile a stock is, and if short-term and long-term moving averages show consistent patterns. We aim to provide a better understanding of stock market trends and patterns for potential new investors.

### 3. How will you collect data and from where:

I will be web-scraping historical stock data using the Python library yfinance, which accesses Yahoo Finance data through API-based requests. I will compare trends, volatility, and correlations across three major sectors - Technology, Financials, and Consumer Goods - over the past three years. I will examine three stocks from each sector: Nvidia, Apple, and Microsoft (Technology); JP Morgan, Visa, and Bank of America (Financial); and Walmart, Costco, and Procter & Gamble (Consumer Goods). For each stock I will collect the date, open, close, high, low, and volume values. I will also compute the daily percent return, 50-day moving average, and 200-day moving average. During data cleaning, I will be removing any missing or corrupted entries as well as market-closed days to ensure that the dataset is properly structured for analysis.

### 4. What analysis will you do and what visualizations will you create:

Once data is collected and cleaned, I will then analyze overall trends by tracking the closing price over time and examining the 50-day and 200-day moving averages to capture both short-term and long-term trends. I will also look at daily percent changes and evaluate the distribution of daily returns to understand volatility within each sector. Additionally, I will also include a market index benchmark, such as the S&P 500, to compare individual stock and sector performance against the broader market. For visualization, I will use a line chart to show closing-price trends over time, moving averages chart to show short-term and long-term averages, and histograms to show the distribution of daily returns. With these visualizations, I will be able to show patterns and behaviors of these stocks and sectors.