**STOCK MARKET ANALYSIS**

**PROJECT OVERVIEW  
Project Type:** Data Analyst Internship- Technical Analysis & Visualization  
**Google Colab Link:** [**https://colab.research.google.com/drive/1kCg18lgU6uVlTvHya1CJruOKBXt18-KV?usp=sharing**](https://colab.research.google.com/drive/1kCg18lgU6uVlTvHya1CJruOKBXt18-KV?usp=sharing) **GitHub Link:** [**https://github.com/PrernaMaurya/Stock-market-data-analyst-**](https://github.com/PrernaMaurya/Stock-market-data-analyst-)

**INTRODUCTION**

This project is aimed at analyzing daily historical stock data for four major companies: Apple (AAPL), Microsoft (MSFT), Netflix (NFLX), and Google (GOOG). The primary goal is to uncover trends and patterns using exploratory data analysis (EDA) and basic machine learning. The project showcases how financial data can be explored using Python libraries and visual tools.

**DATASET OVERVIEW**

The dataset contains approximately 248 entries spanning across 3 months of daily stock records for the four companies. Each record includes key financial indicators such as:

**●Date:** Daily time index

**●Ticker:** Stock symbol (AAPL, MSFT, etc.)

**●Open, High, Low, Close, Adj Close:** Daily stock price metrics

**●Volume:** Number of shares traded on that day

**TOOLS & LIBRARIES USED**

The analysis was conducted using Google Colab, with the following Python libraries:

**●Pandas** and **NumPy** for data cleaning and manipulation

**●Matplotlib** and **Seaborn** for visualizations

**●Scikit-learn** for building and evaluating a Linear Regression model

**METHODOLOGY**

**a) Data Cleaning**

●Converted Date column into datetime format

●Sorted records by date for accurate rolling calculations

●Checked and handled missing values

**b) Exploratory Data Analysis (EDA)**

●Line plots for closing prices of each company

●Comparative analysis of trading volume using time-series plots

**c) Technical Indicators**

**●Moving Averages:** 7-day and 30-day moving averages were calculated to understand short and mid-term trends.

**●Volatility:** Rolling standard deviation (7-day) of daily returns was computed to visualize fluctuations in stock prices.

**d) Correlation Analysis**

●Created a pivot table with closing prices of each stock

●Generated a Pearson correlation matrix

●Visualized with a heatmap to identify stock interdependence

**e) Predictive Modeling**

●A Linear Regression model was built using AAPL stock data.

●Features: Open, High, Low, Volume

●Target: Close price

●Evaluated using Mean Squared Error and R-squared to assess prediction quality

**KEY INSIGHTS**

●Apple and Microsoft had the strongest positive correlation, often moving together.

●Netflix showed higher volatility, indicating a riskier investment over the period.

●The moving averages helped smooth price trends and identify momentum shifts.

●The regression model, while simple, demonstrated how machine learning can aid in short-term price estimation.

**CONCLUSION**

This project demonstrates a comprehensive data analyst workflow, starting from raw financial data to visual interpretation and predictive modeling. Through this exercise, technical indicators like moving averages and volatility were effectively used to extract meaningful insights. The correlation analysis highlighted stock relationships useful for investment planning. Lastly, the application of a linear regression model gave a practical glimpse into predictive analytics in finance.

**FUTURE SCOPE**

●Generalize the model across all stocks using group operations

●Extend the dataset across 6–12 months for better trend capture

●Upgrade prediction using time-series models like ARIMA, Prophet, or LSTM

●Deploy an interactive dashboard using Streamlit or Plotly Dash

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