PREDICTING THE STOCK MARKET

By - Rohit Grover

MAG 7 STOCK PRICE PREDICTION THROUGH ML

- The MAG 7 Stocks
  - A combined market capitalization of about $14 trillion
  - Exposure to high-growth technologies such as high-end software and hardware, cloud computing, and Artificial Intelligence
  - Each of the seven stocks has outperformed the S&P 500 by a huge margin in the past decade

- The ML Approach and Impact
  - Collect and preprocess stock price and Financial Indicators' data.
  - Combine Technical and Fundamental Factors to predict future stock prices.
  - Can be used by portfolio managers of investment funds or individual investors to maximize returns or to balance Risk and Rewards.

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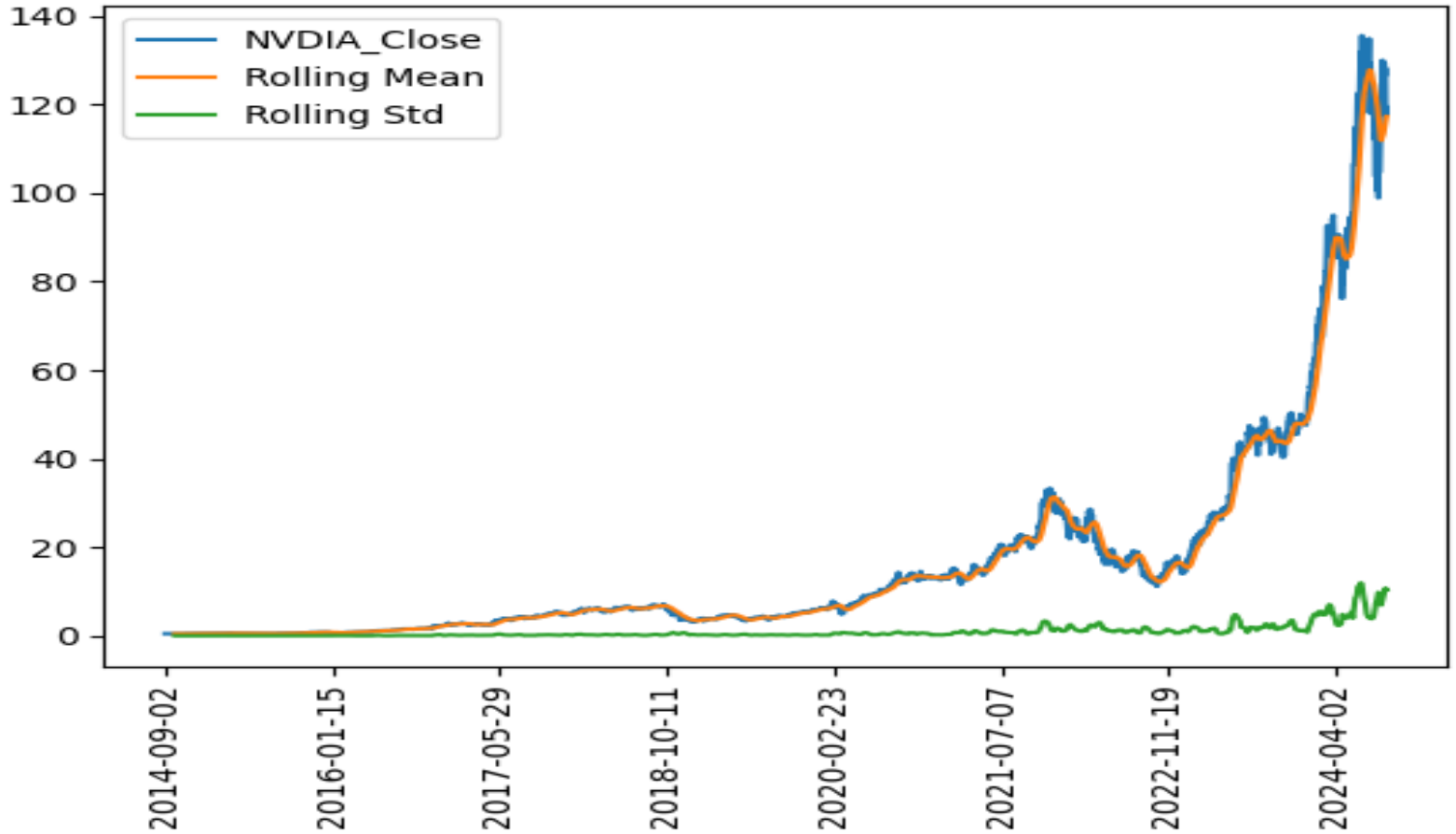
COLLECTION OF DATA AND PREPROCESSING

- Gathered last 10 years' stock price data from "yfinance" APIs
- Gathered last 10 years' financial indicators' data from "Fred API"
- Financial indicators included "GDP Growth", "Inflation", "Unemployment Rate", "Retail Sales" and "Industrial Production".
- Fundamental Factors included "P/E Ratio" and "EPS"
- Calculated Technical Indicators like Rolling Average
- Forward filled and removed rows containing missing data
- Calculated lagged independent variables

EXPLORATORY DATA ANALYSIS



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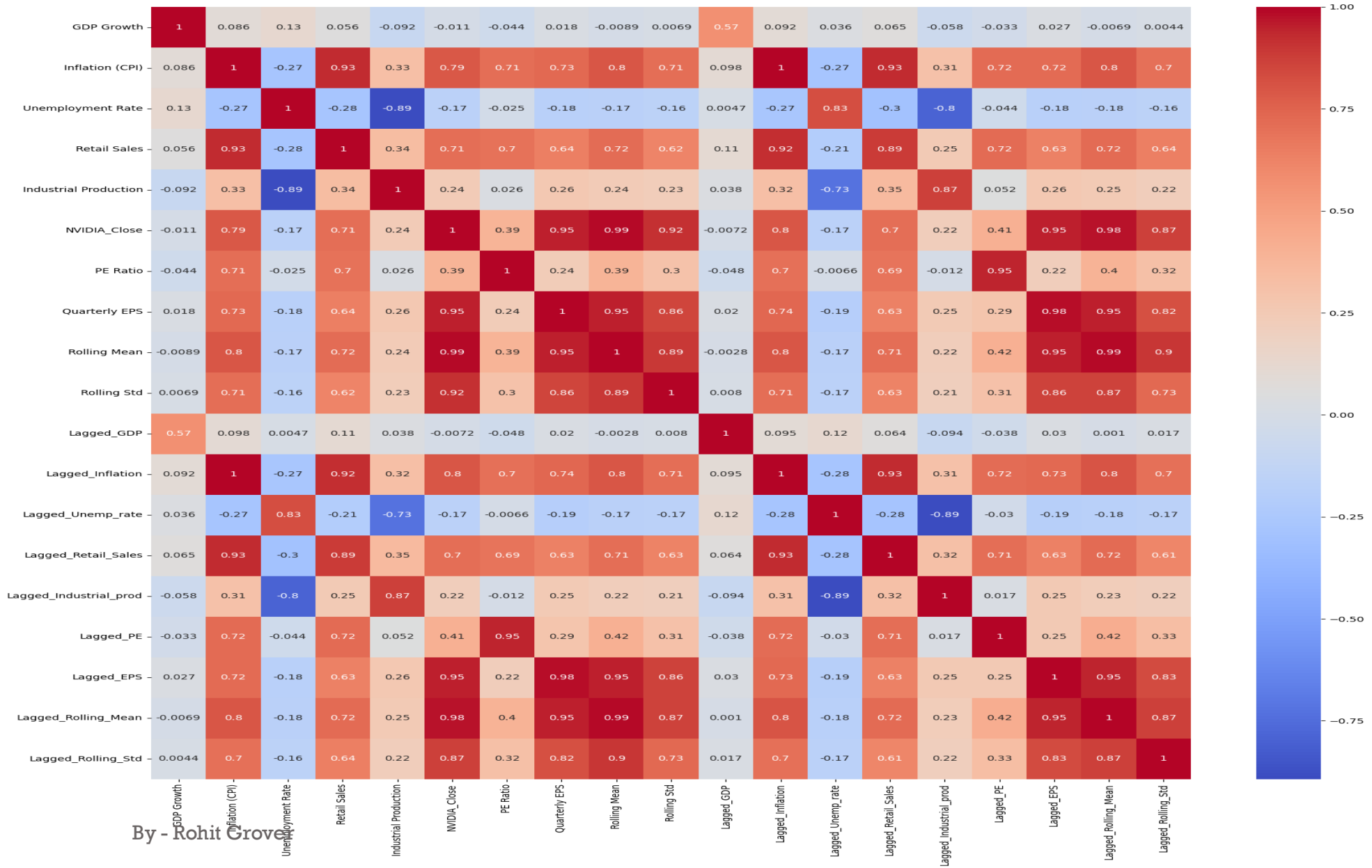

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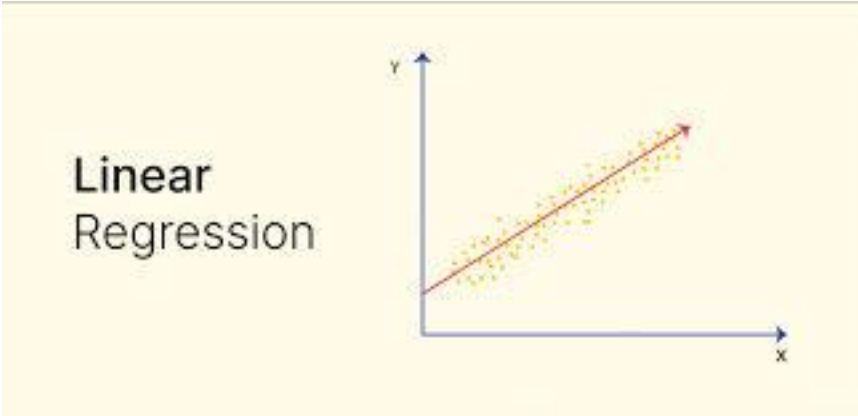
ML MODELS

➢Baseline Model



- Train-Test Split and The Treachery of Data Leakage
  - Achieved an R-sq of 0.99 ☺
- Split Data by Dates
  - Fit a Linear Regression Model
  - Got an R-sq of 0.77 after adjusting the model and feature elimination through Recursive Feature Elimination (RFE)

➢Advanced Neural Network

- Grid Search CV and Hyperparameter Tuning
- Improved the R-sq to 0.79

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MODEL EVALUATION

- Mean Absolute Error (MAE)
- Mean Squared Error (MSE) / Root Mean Squared Error (RMSE)
- R-squared (R^2)
- Directional Accuracy
- Mean Absolute Percentage Error (MAPE)

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ML MODEL HOSTED ON STREAMLIT - DEMO

https://groverrohit-bs-capstone-predicting-mag7-stockprices.streamlit.app/

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THANK YOU

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