IBM STOCKS

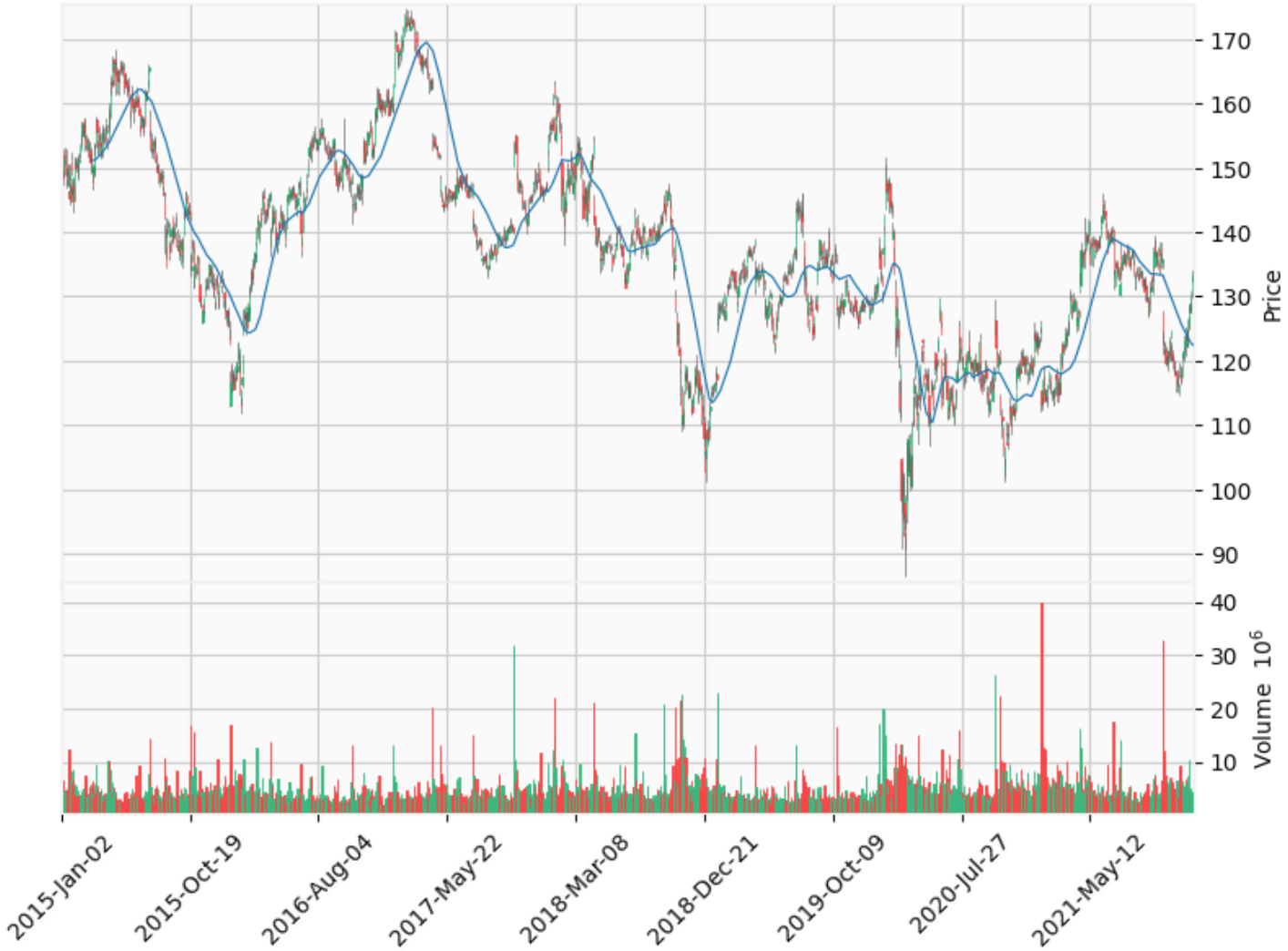
Shethala Boggarapu

Overview

This project involved a detailed analysis of IBM's stock performance from 2015 to 2021 using data sourced from Yahoo Finance. The goal was to understand the impact of market conditions, company strategies, and economic events on IBM's stock prices through visualizations and machine learning models.

Data and Visualization

The dataset included daily stock metrics like opening, closing, high, low prices, and volume. Key insights were derived from visualizations such as line charts, candlestick charts, and volume-price trend analysis over various timeframes.



Significant Observations

1. **COVID-19 Impact (March 2020):** A significant drop in IBM's stock price was observed in March 2020, correlating with the global financial markets' downturn due to the COVID-19 pandemic.
2. **Strategic Decisions (2015):** The year 2015 saw a sharp decline in stock prices, coinciding with IBM's 14th consecutive quarter of revenue decline. This period also marked strategic acquisitions and partnerships aimed at reviving growth, which initially failed to offset the declining sentiment.
3. **Divestiture Effects:** The sale of IBM's x86 server division to Lenovo in 2015 contributed to a short-term revenue drop, influencing stock prices negatively as the company transitioned away from hardware to focus on higher-margin sectors like cloud computing and artificial intelligence.

Analysis Using Machine Learning

Various predictive models were applied to anticipate stock price movements:

- **Binary Indicator Model:** Where the target variable indicated an increase (1) or decrease (-1) from one day to the next.
- **Moving Average Strategy:** Used a 50-day and a 200-day moving average to determine the buy or sell signals based on their crossover.
- Models like KNN, Random Forest, and XGBoost were employed, with KNN achieving the highest accuracy in both strategies, highlighting the potential predictive power of these techniques.

Conclusions and Insights

The detailed analysis showed that external events like pandemics significantly impact stock behavior, which aligns with observed volume spikes and price drops. Internal strategic decisions, while aimed at long-term growth, can cause short-term market reactions. The use of advanced analytics and machine learning provided deeper insights into market behavior and helped develop strategies for predictive modeling.

This project underscores the importance of integrating financial analysis with machine learning to better understand and predict stock market trends, offering a robust approach to financial decision-making.

SHETHALA BOGGARAPU

• +1 5512603442
• shethalaboggarapu@gmail.com
• LinkedIN
• Github