

Econometric Explorers

Presented On:

February 13, 2024



Forecasting S&P 500 Index Using Prophet, ARIMA and Python

About Us

- Adventurous researchers exploring data landscapes.
- Utilize statistical and economic tools.
- Navigate complex regression models to uncover hidden relationships.
- Employ econometric models for insights into economic phenomena.
- Focus on discovery and sharing findings to enrich global knowledge.
- Aim to guide future explorers.

“ Investors should temper expectations for 2024 as estimates for profit growth look lofty, volatility has been unusually high, and inflationary pressures could come under further pressure and economic growth is likely to slow.”

— J.P. Morgan

“ 2024 is likely to be a “tale of two halves,” with a cautious first half giving way to stronger performance in the second half of the year.”

— Morgan Stanley

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Project Team



Todd
Project Manager



Chris
Data Scientist



Sergio
Data Scientist



Reece
Data Scientist

Project Overview

Key Executive Points

- AI boot camp project to forecast S&P 500 index.
- Used Prophet, Seaborn's Heatmap, and ARIMA libraries in Python.
- Analyzed five years of S&P 500, gold, and crude oil historical data from CSV files.
- Aimed to develop accurate S&P 500 predictions by identifying correlations with gold and oil prices.
- Seeks to offer insights for informed investment decisions.

Data Collection Process

We developed a good strategy in this project in the form of more creative innovation.

01.

Proposals Draft, Data Collection and Preprocessing

02.

Familiarization with Prophet and Python Environment Setup

03.

Model Development and Initial Testing

04.

Model Tuning and Optimization

06.

Documentation, Report Writing, and Presentation Prep

05.

Validation and Fine-tuning

07.

Final Review



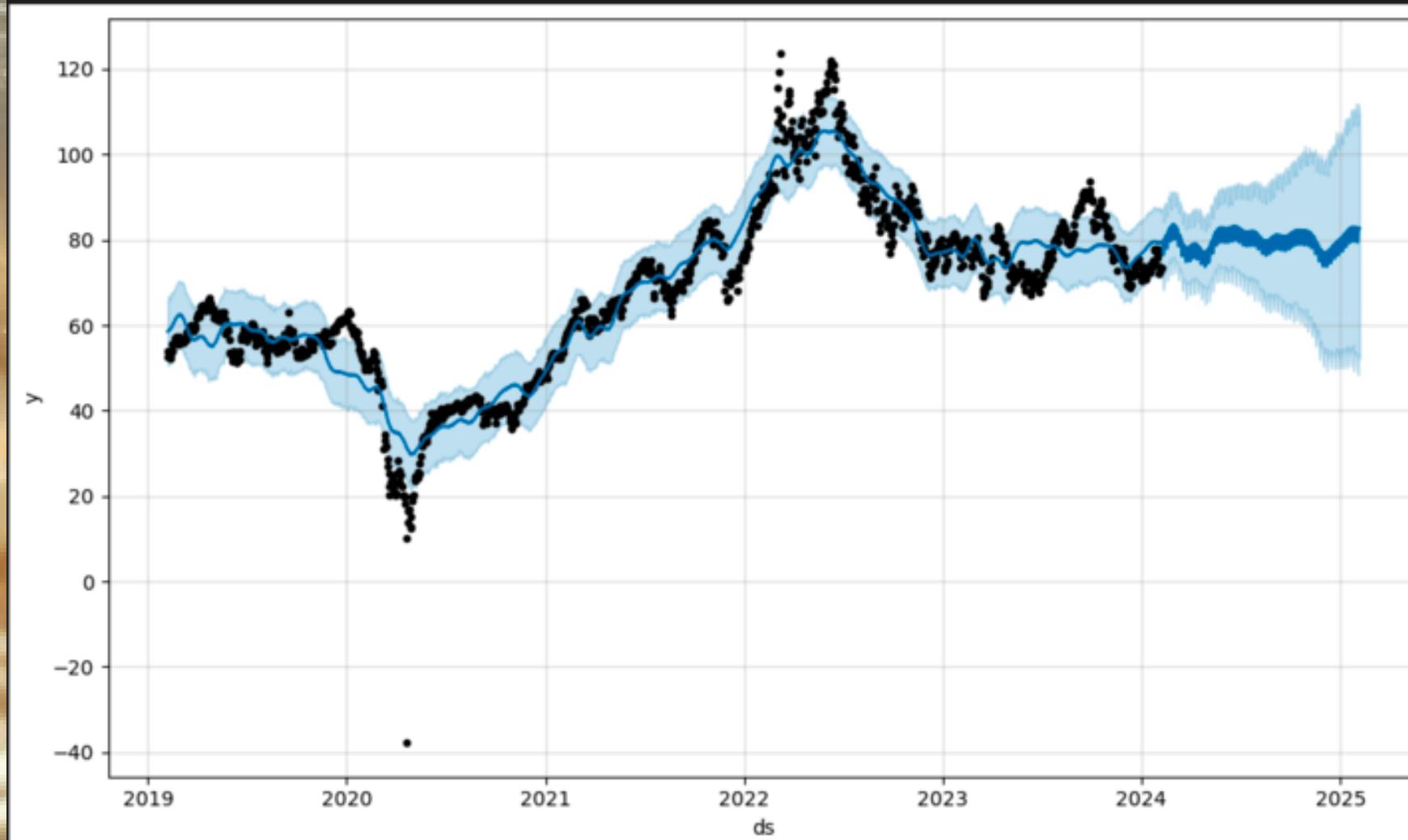
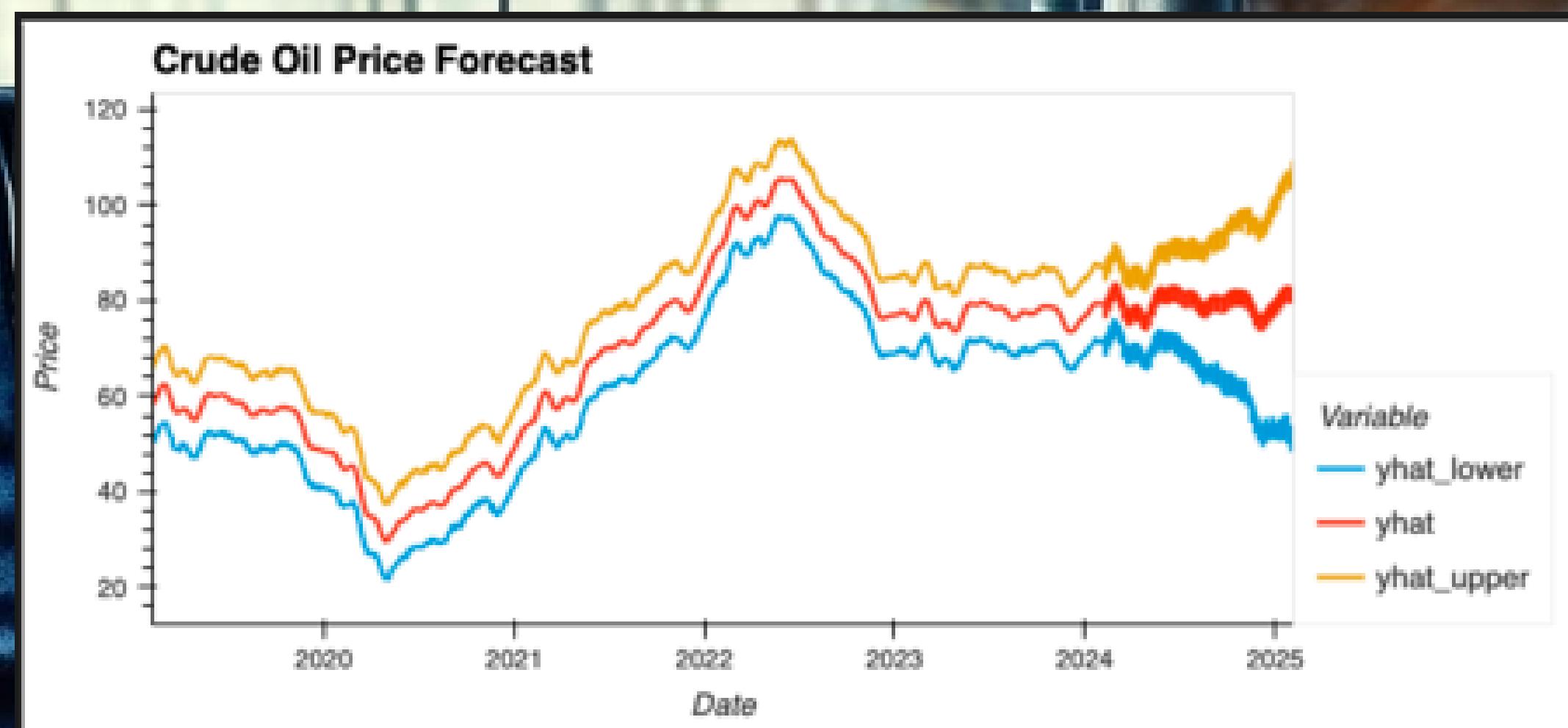
Data Exploration

Installing and using yfinance, we researched & pulled data on the S&P 500, gold and oil in order to plot results for the last 5 years

← 2-9°
WALLS



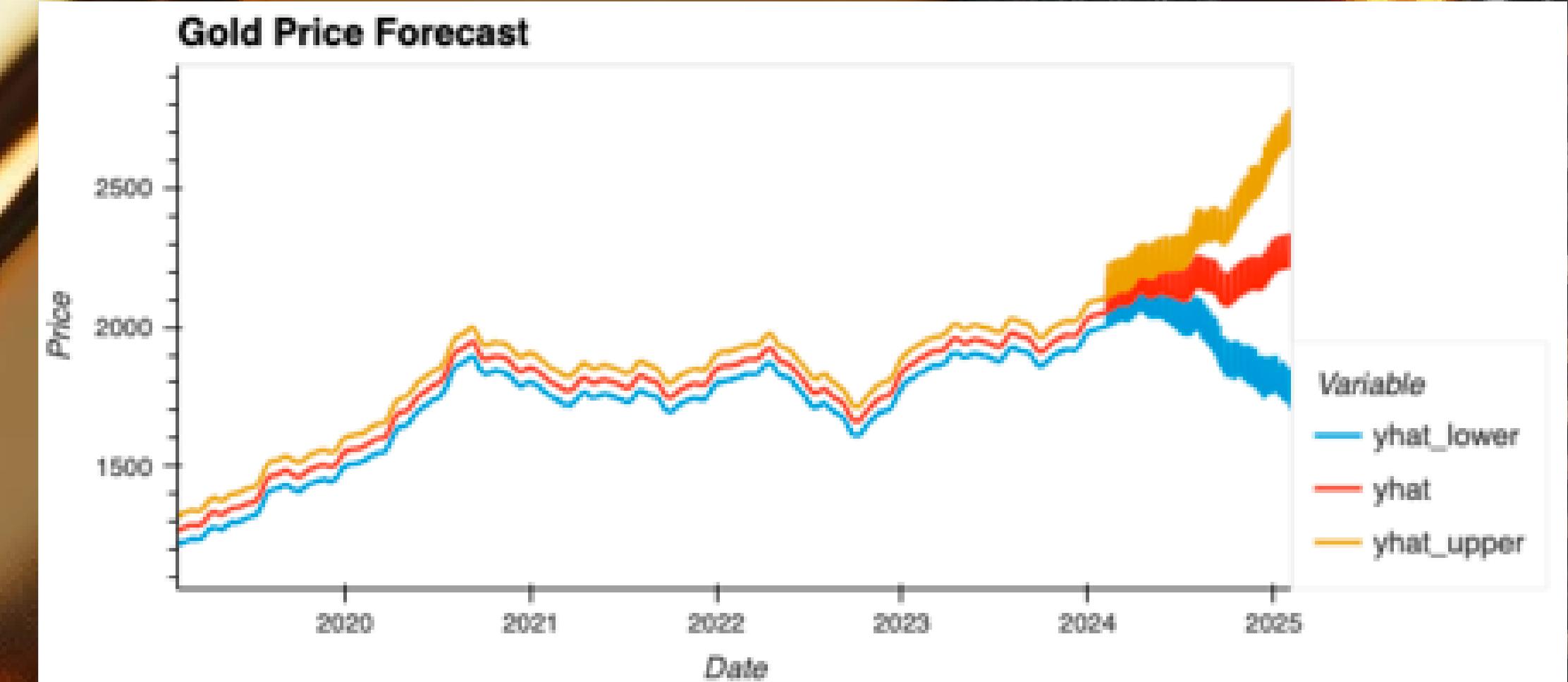
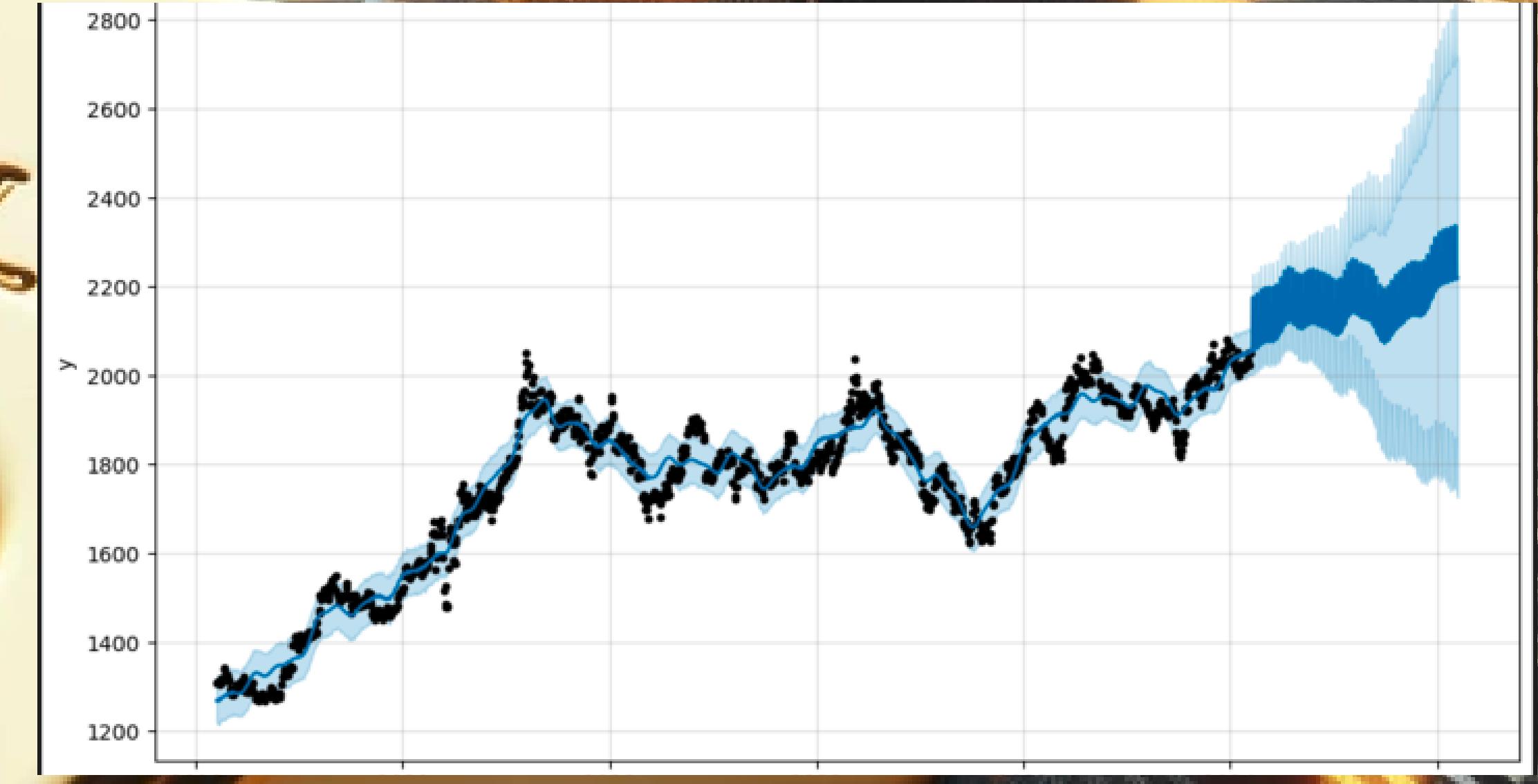
Crude Oil



Plotted
Forecasts

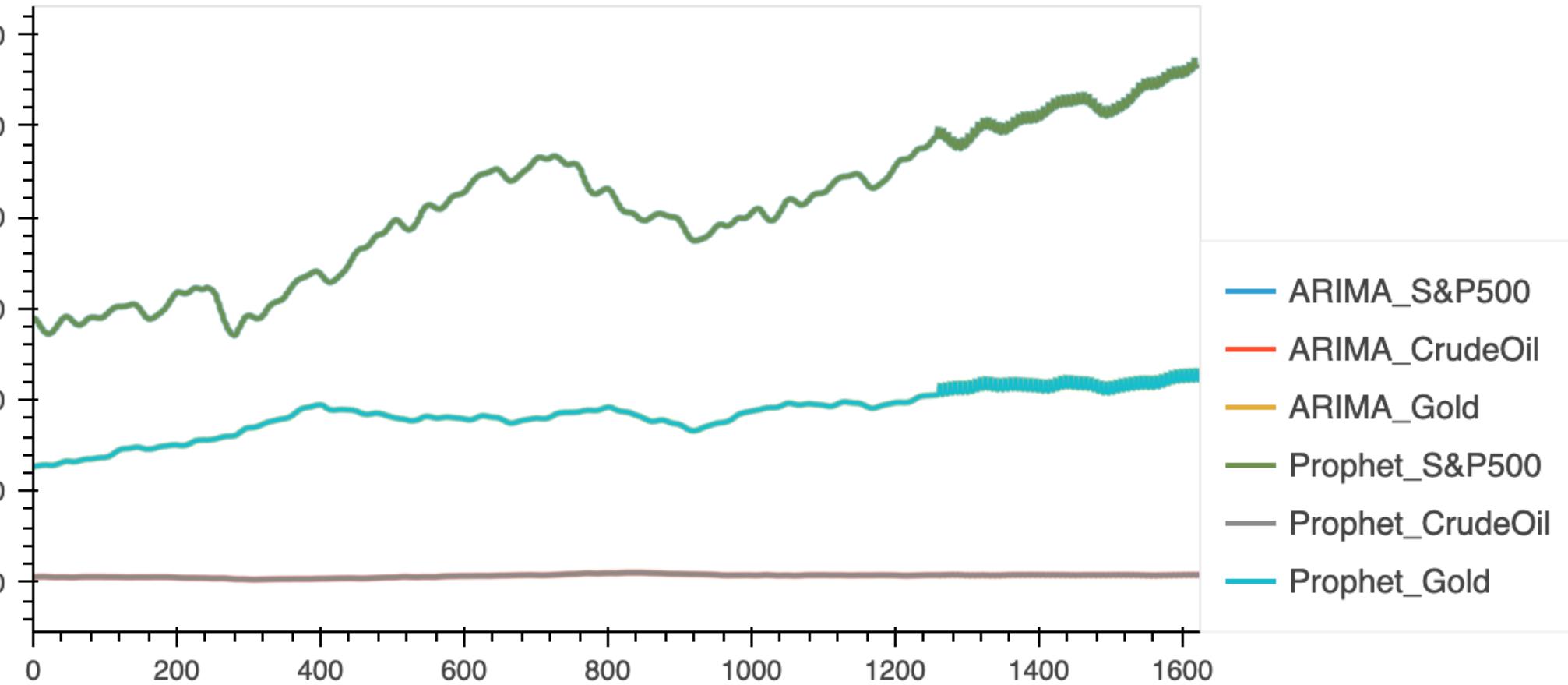
Gold Plotted

Forecasts

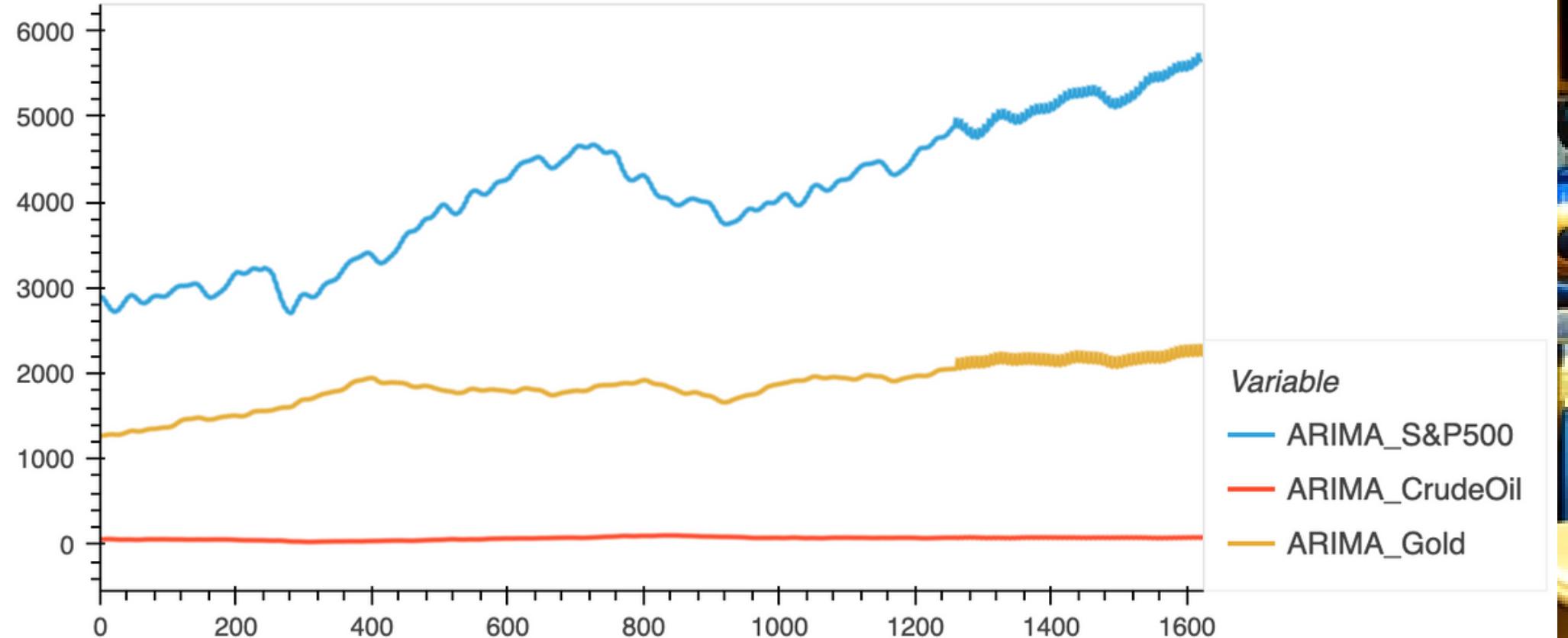


ARIMA

Combined ARIMA Predictions



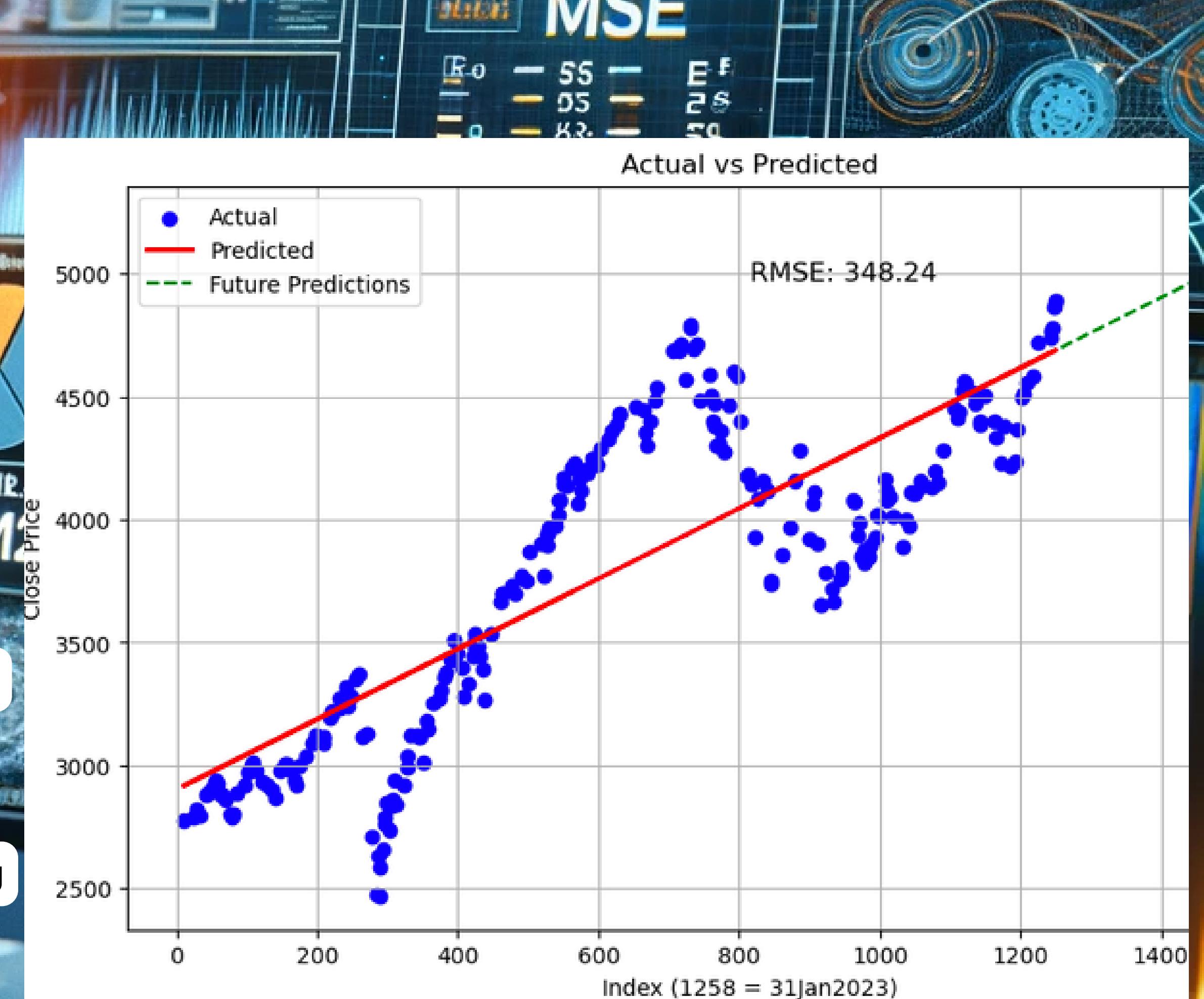
ARIMA Predictions



Predictions

RMSE

Imagine you're trying to predict something, like how much a package will weigh when you send it. RMSE is like measuring how close your guesses are to the actual weights. It gives you a single number to show how accurate your guesses are on average, with smaller numbers meaning you're doing a better job at guessing.



Conclusion

- Analysis showed that the correlation between Prophet and ARIMA model predictions for the S&P 500 index, crude oil, and gold was NaN.
- This indicates a lack of linear relationship between the forecasts.
- Further investigation is needed to understand the discrepancy.
- Assessing the reliability of forecasting methods in financial markets is crucial.



Thank You!

Well folks, congratulations, we've finally reached the end of our presentation marathon. Let's all take a moment to mourn the loss of those precious minutes we'll never get back.

Questions

Financial Analysis



Questions

Answers



Q & A

WE INVITE YOU TO
ASK US QUESTIONS

