



Project 1: Technical Analysis



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Dataset

Company: Reliance

Asset: Stocks

Time Period: 1-24-2021 to 1-24-2024



Data visualisation



Technical Indicators

Simple Moving Average

A simple moving average (SMA) is an arithmetic moving average calculated by adding recent prices and then dividing that figure by the number of time periods in the calculation average

Relative Strength Index

The relative strength index (RSI) is a momentum indicator used in technical analysis. RSI measures the speed and magnitude of a security's recent price changes to evaluate overvalued or undervalued conditions in the price of that security.

Bollinger Bands

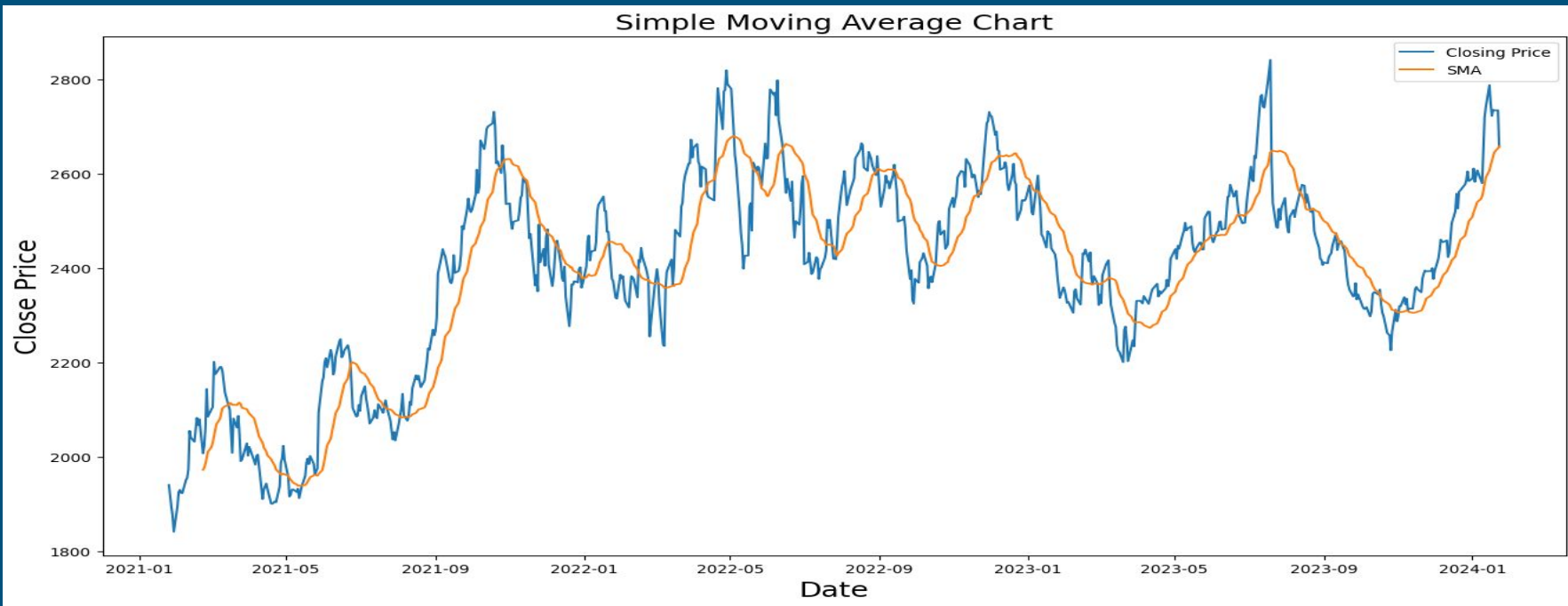
Bollinger Bands are composed of three lines. One of the more common calculations uses a 20-day simple moving average (SMA) for the middle band. The upper band is calculated by taking the middle band and adding twice the daily standard deviation to that amount. The lower band is calculated by taking the middle band minus two times the daily standard deviation.

MACD

Moving average convergence/divergence (MACD, or MAC-D) is a trend-following momentum indicator that shows the relationship between two exponential moving averages (EMAs) of a security's price. The MACD line is calculated by subtracting the 26-period EMA from the 12-period EMA.

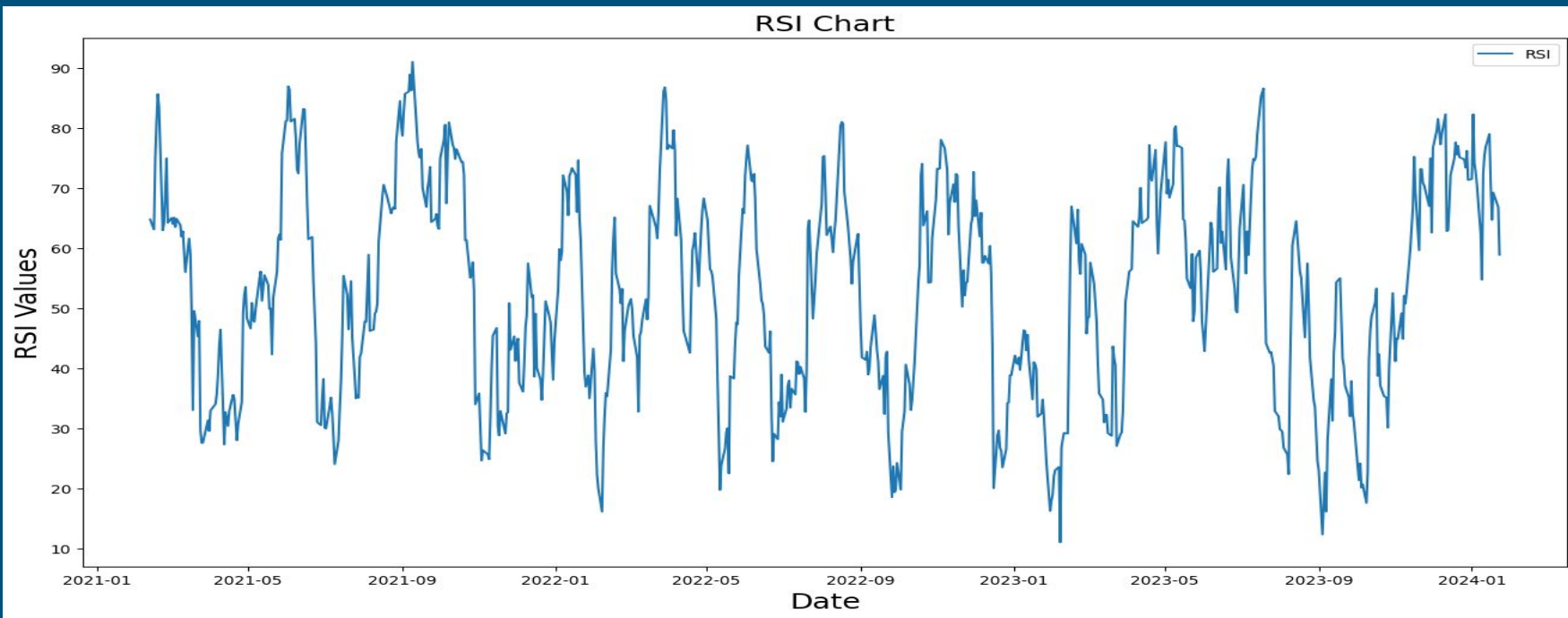
Visualisations of the Indicators

Simple Moving Average



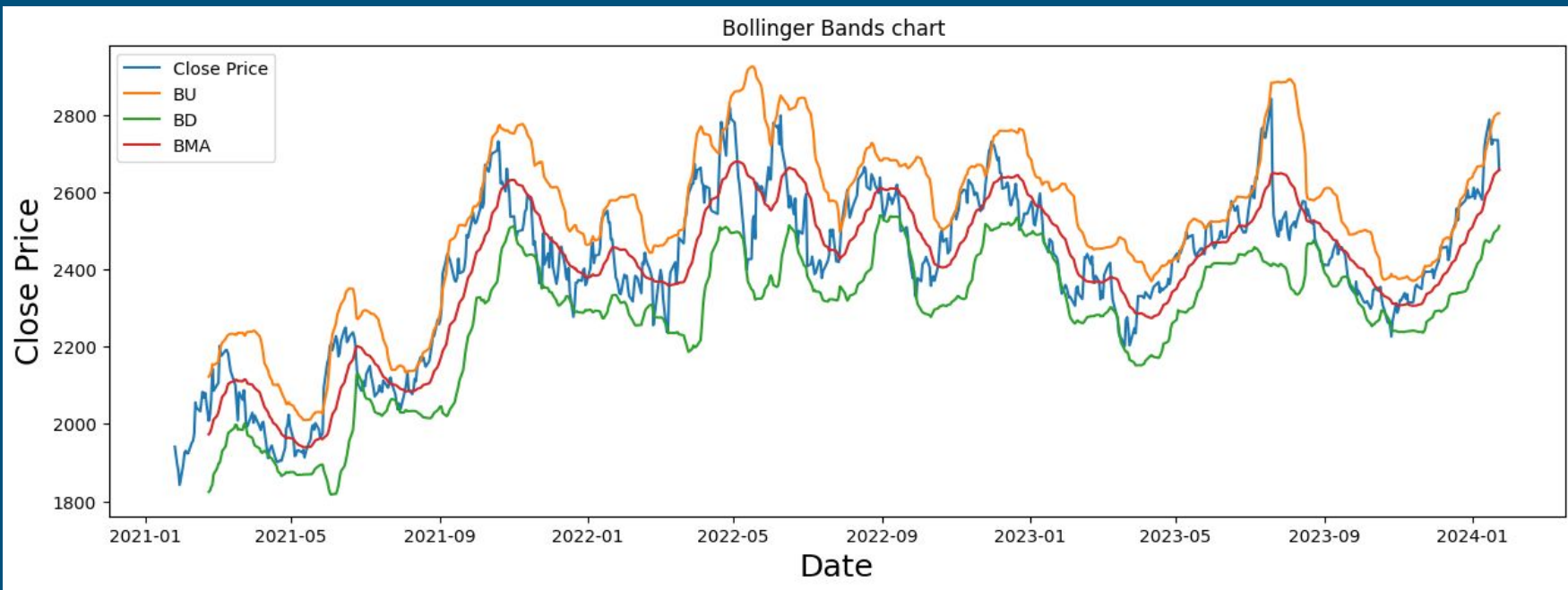
Visualisations of the Indicators

Relative Strength Index



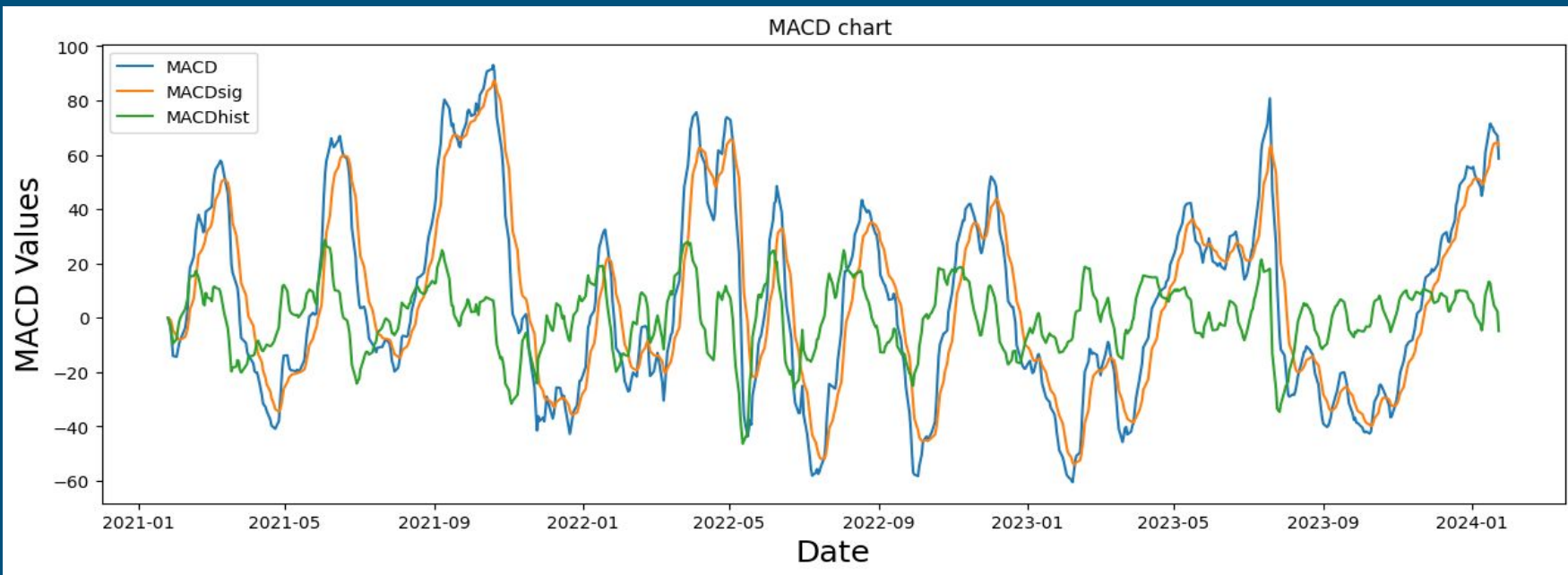
Visualisations of the Indicators

Bollinger Bands



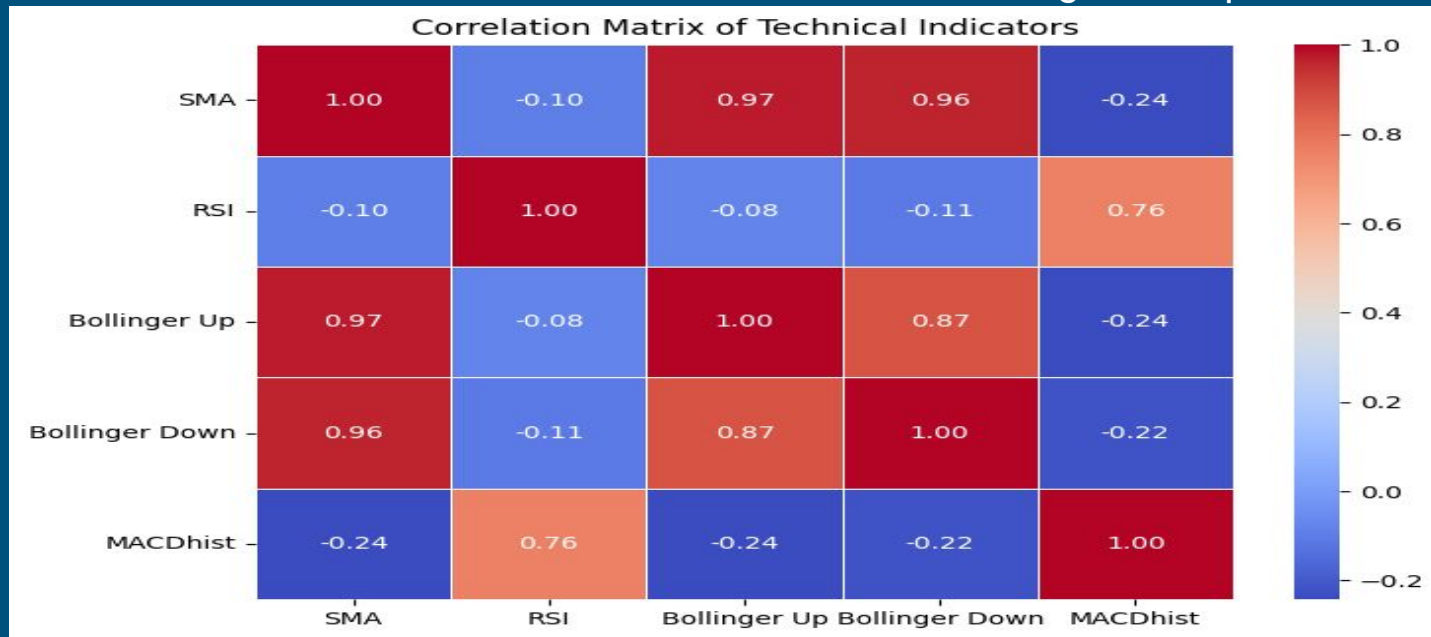
Visualisations of the Indicators

MACD (Moving Average Convergence Divergence)



Correlation Analysis

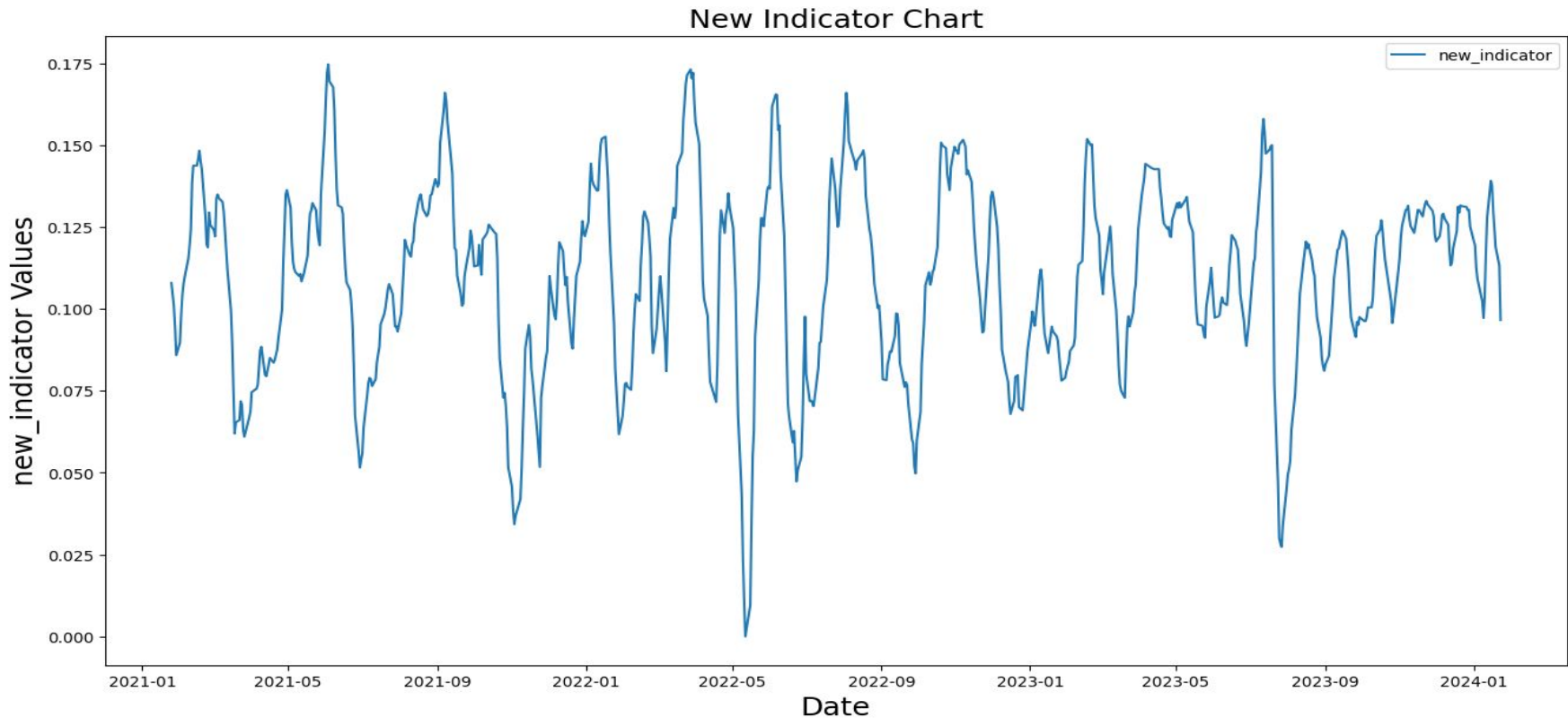
- First all the indicators are scaled using min max scaler so that they can come at equal level
- Now covariance matrix is calculated and visualised using heatmap.



Combined Indicator

- Combined Indicator is weighted sum of the used four indicators.
- Weights are calculated using the correlation matrix calculated in the previous step.
- For every indicator all covariance values with another indicators are added.
- Weights are nothing but the sum calculated in the previous step divided by sum of all covariance values.
- Now every indicator is multiplied by its corresponding weight and added to get the combined indicator or new indicator.

Visualisation of the New Indicator



Predictions

- First true outcomes are calculated using the formula

$$r_j = \frac{P_{t+1} - P_t}{P_t} \equiv \frac{P_{t+1}}{P_t} - 1$$

- If $r_j > 0$ then we will long the stock or bull the stock, else short or bear the stock.
- After this predicted outcomes are calculated on the basis of combined indicator.
- We have used simple moving average over a period of 10 days to predict the outcomes.
- If the current new indicator value is greater than the average new indicator value then we will long/bull the stock else short/bear the stock.
- From this method we achieved the accuracy of 59.84 percentage.

Thanks

References

<https://www.investopedia.com/>

<https://finance.yahoo.com/>