1)Indicators:

- **MACD (Moving Average Convergence/Divergence):**
  MACD is a trend following momentum indicator ,below i had shown how and why I had used it with particular value.
  The 12-period EMA represents the short-term moving average, while the 26-period EMA represents the long-term moving average. The difference between these two moving averages captures the balance between short-term and long-term price trends.(The 26-period EMA, being a longer-term average, provides a smoother trend following component to the MACD. The 12-period EMA, on the other hand, offers a more sensitive and shorter-term representation of price movements. The difference between these two EMAs captures the convergence or divergence of these short and long-term trends, making it a good compromise between responsiveness and smoothness.)
  The 9-period EMA used as the signal line helps smooth out the MACD(A 9-period EMA is relatively sensitive to short-term price movements, making it suitable for detecting short- to medium-term trends.).
  The MACD Line represents the short-term momentum, and the MACD Signal helps confirm the direction of the trend. When the MACD Line crosses above the MACD Signal, it indicates increasing short-term bullish momentum, and when it crosses below the MACD Signal, it suggests increasing short-term bearish momentum.And since I don't want to hold the trade for too long or in other words for short duration trade I had taken these value.
  Calculation:
  -MACD LINE=EMA12-EMA26
  -MACD signal=EMA(MACD LINE)9

- **RSI (Relative Strength Index):**
  RSI measure the speed and change of price movements in a financial asset and helps to decide whether the stock is overvalued or undervalued.How does it do is basically it compares a security's strength on days when prices go up to its strength on days when prices go down. Relating the result of this comparison to price action can give traders an idea of how a security may perform **.**RSI is a speed checker for stocks. It measures how fast and strong a stock's price is changing. If RSI hits 70 or higher, that's like a red flag ,if it drops to 30 or lower,it is a green flag . But I prefer to be a bit more cautious and use 75 as your overbought signal and 25 as your oversold signal. I particularly chose 14 period for calculation because Shorter periods may result in more frequent but less reliable signals, while longer periods can make the RSI less responsive to price changes and since I am neither using very short term trading nor long term i went with default one.

  Calculation:
  -RSI=100-[100/(1+(average gain/average loss))]
  -average gain=average(close price-open price{updated if it is >0 then only}) of 14 days
  -average loss=average(open price-close price(updated if it is >0 then only)) of 14 days

- **Stochastic Oscillator:**

  The Stochastic Oscillator is a range-bound indicator, always fluctuating between 0 and 100. It's valuable for spotting overbought conditions (above 80) and oversold conditions (below 20). However, extreme readings don't necessarily guarantee an immediate reversal; strong trends can persist in these conditions.It has two component

%kline and %dline.The %K line represents short-term price momentum and can be quite volatile. It moves within the 0 to 100 range and generates frequent fluctuations.The %D line moves more slowly than the %K line because it is an average of the %K values. This slower movement makes it less sensitive to short-term fluctuations and offers a more smoothed representation of price momentum.
Crosses between the %K and %D lines, along with overbought and oversold levels, can generate trading signals. For example, a sell signal may be generated when %K crosses below %D in the overbought region, and a buy signal when %K crosses above %D in the oversold region.
I chose smoothing period 3 because The 3-day smoothing period helps generate timely signals, which is especially valuable for traders seeking shorter-term trading opportunities. Since I donot prefer a longer-term perspective, i am not considering a longer smoothing period and 2 will not smoothen the curve as i expect thus I chose 3.

Calculation:

-%K=(C-L)/(H-L)*100
{c=recent closing price,
L=low traded price of 14 days,
H=highest traded price of 14 days}
-%D=EMA(%K)3

2)Strategy

As it is pretty clear I am using momentum trading strategy since i am using momentum indicators .I chose RSI ,MACD,stochastic indicators particularly because RSI helps on focusing on overbought and oversold conditions, MACD indicates momentum and trend direction, and the Stochastic Oscillator identifies potential reversals , Although it is suggested to use indicator of different type to make your strategy diverse and had broader perspective of the stock but instead i preferred to use closely related type because When RSI, MACD, and the Stochastic Oscillator all align and provide similar signals, it strengthen confidence in a trading decision and thus have more surety on particular trades and thus reducing false signals . RSI helps to determine the potential strength of a trend, MACD helps to identify trend direction, and the Stochastic Oscillator can pinpoint entry and exit points, allowing to manage risk more effectively.

Entry Strategy:

MACD Crossover: The entry strategy begins by evaluating the MACD indicator. A buy opportunity is considered when the MACD line crosses above the MACD signal line. This crossover indicates a shift in short-term momentum towards the upside, suggesting a potential upward trend in the stock. In simpler terms, it signifies the faster-moving MACD line overtaking the slower-moving signal line, indicating the stock is gaining strength. When this condition is met, buying the stock may be an option thus checking it further for conformity.

RSI Confirmation: After identifying a potential buying opportunity through the MACD crossover, the next step involves checking the Relative Strength Index (RSI). To confirm the buy signal, the RSI should not be in an overbought condition, which is indicated by an RSI value exceeding 75. If the RSI is below 75, it indicates that the stock is not overbought, and then proceed to the next indicator .

Stochastic Oscillator: Once the RSI confirms the absence of overbought conditions, the Stochastic Oscillator is examined. A buy signal occurs when the %K line crosses above the %D line while in the oversold region . This crossover suggests that the stock might be due for an upward move after being oversold, and it's considered a potential buying opportunity.

Position Size Calculation: If all the above conditions are satisfied , a position in the stock is considered. The position size is determined according to the RSI indicator, using the formula 40 * square root(75 - RSI value).willing to risk for 40 share minimum and calculating its strength from overbought condition , more close to 0 very high the buy signal and more close to 75 weaker the signal.

Exit Strategy:

MACD Crossover: The exit strategy also starts with evaluating the MACD indicator. A sell opportunity is considered when the MACD line crosses below the MACD signal line. This crossover indicates a shift in short-term momentum towards the downside, suggesting a potential downtrend in the stock. It's analogous to the MACD line slowing down and falling below the signal line. This is considered a potential sign to sell or even take a short position in the stock.

RSI Confirmation: After identifying a potential selling opportunity through the MACD crossover, the next step is to check the RSI. To confirm the sell signal, the RSI should not be in an oversold condition, which is indicated by an RSI value below 25. If the RSI is above 25, it indicates that the stock is not oversold, and the analysis can proceed to the next step.

Stochastic Oscillator: Once the RSI confirms the absence of oversold conditions, the Stochastic Oscillator is examined again. A sell signal occurs when the %K line crosses below the %D line while they are in the overbought region. This crossover indicates that the

stock may have been overbought and could be due for a downward correction, making it a potential time to sell.

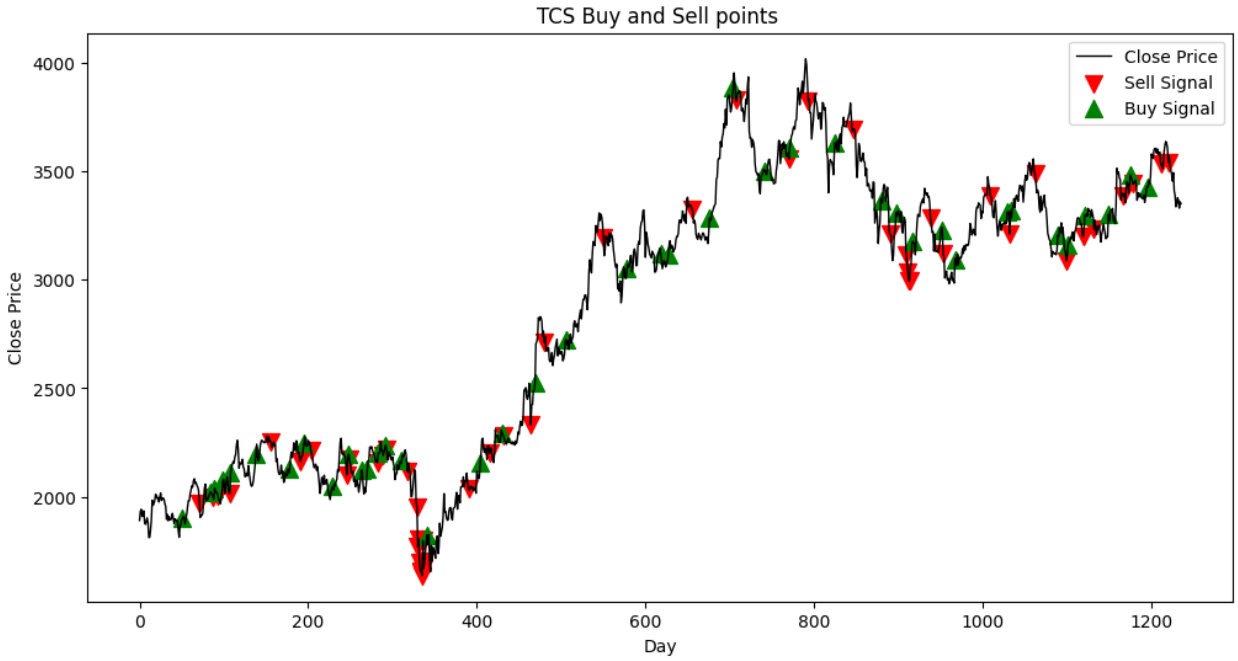
Position Size Calculation: If all the above conditions align, a position is exited or a short position is taken. The position size for the exit is calculated according to the RSI indicator, using the formula 40 * square root(RSI value - 25). A higher value of this calculation indicates a stronger sell signal, while a lower value indicates a weaker signal.

Stop loss: If it is neither the sell or buy signal and stock at that current point is greater than 0 then i am checking for the possibility that i am not losing too much money or not more than 10 percent from the price i bought it , if in case i am losing it then i will sell half of the holded shares .By this i am playing safe and minimizing my loses.

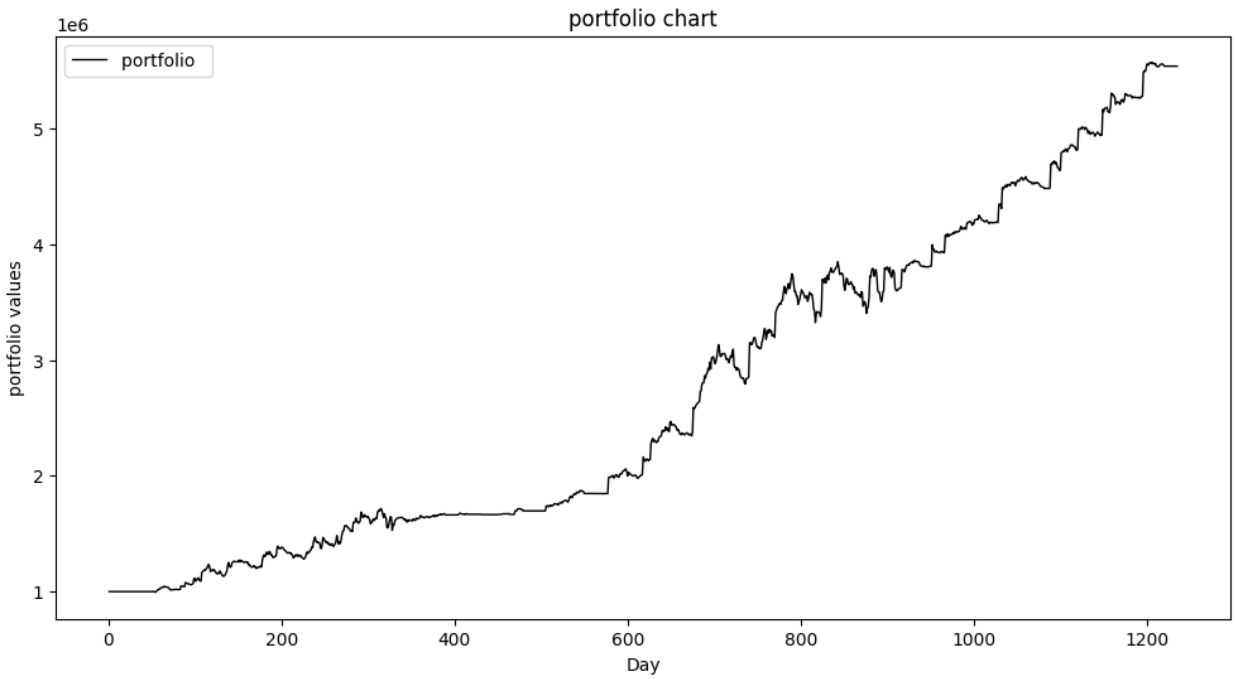
My strategy lacks at one major point that's why the chosen stocks are little specific but I will make improvements also . My strategy does not identify trend reversal although i have indicators for that . So in case a particular stock price follows a trend for the long duration of more than approx 30 days then my strategy wont give accurate results as expected . Thus a little volatile stock should be chosen with appropriate investing amount according to the stock price so that stock purchase minimum and selling might vary .

3)Buy and sell points : Here is the graph depicting the buy and the sell points for the last five years from now on the 4 different stocks .
Along with graph I had also mentioned the number of executed trades, maximum drawdown, win ratio, loss-making trades, largest loss-making trade, largest profit-making trade .

- **TCS(TCS.NS):**

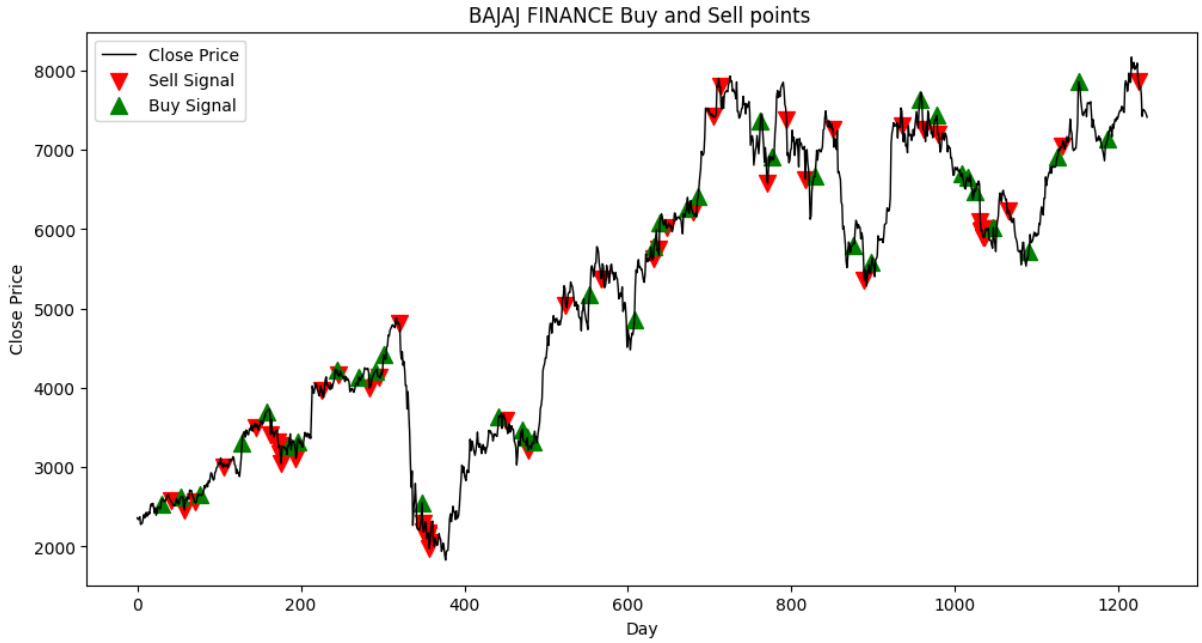


the number of executed trades:51
win ratio:0.53
loss-making trades:25
largest loss-making trade: -95061.228
largest profit-making trade:153984.176

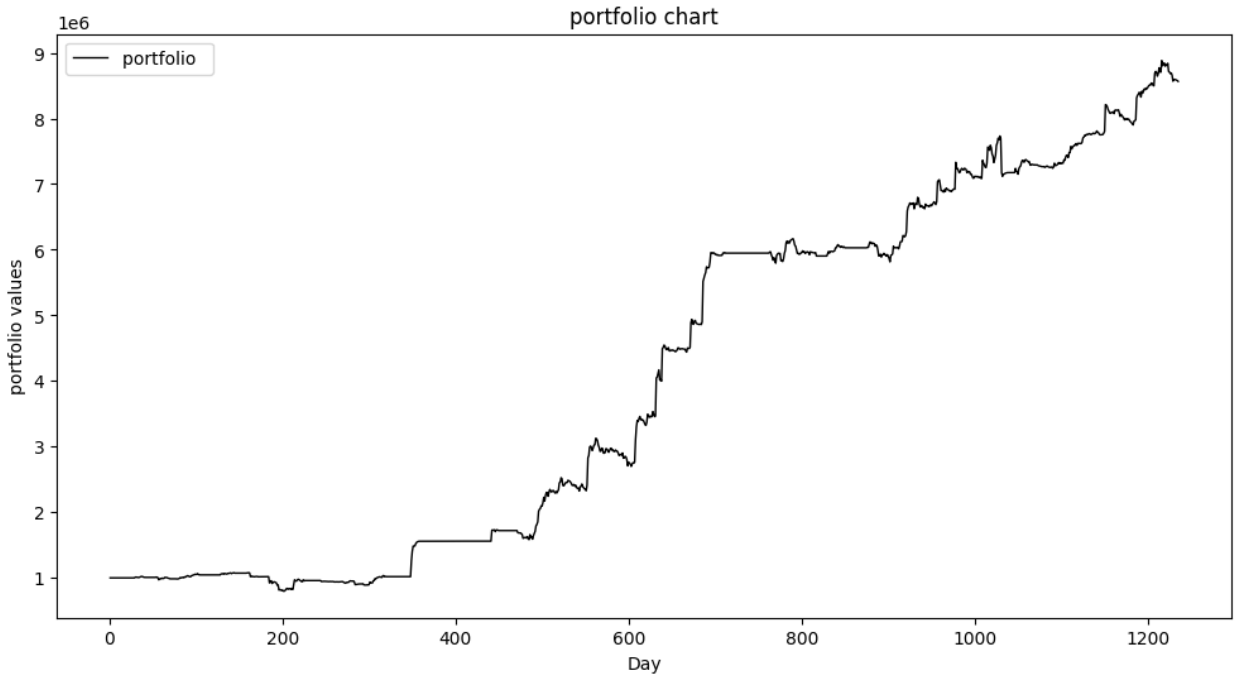


As the closing price graph have sharp up trend and low trend and is volatile as well , thus my strategy works at this stock.

- **Bajaj Finance (BAJFINANCE.NS):**

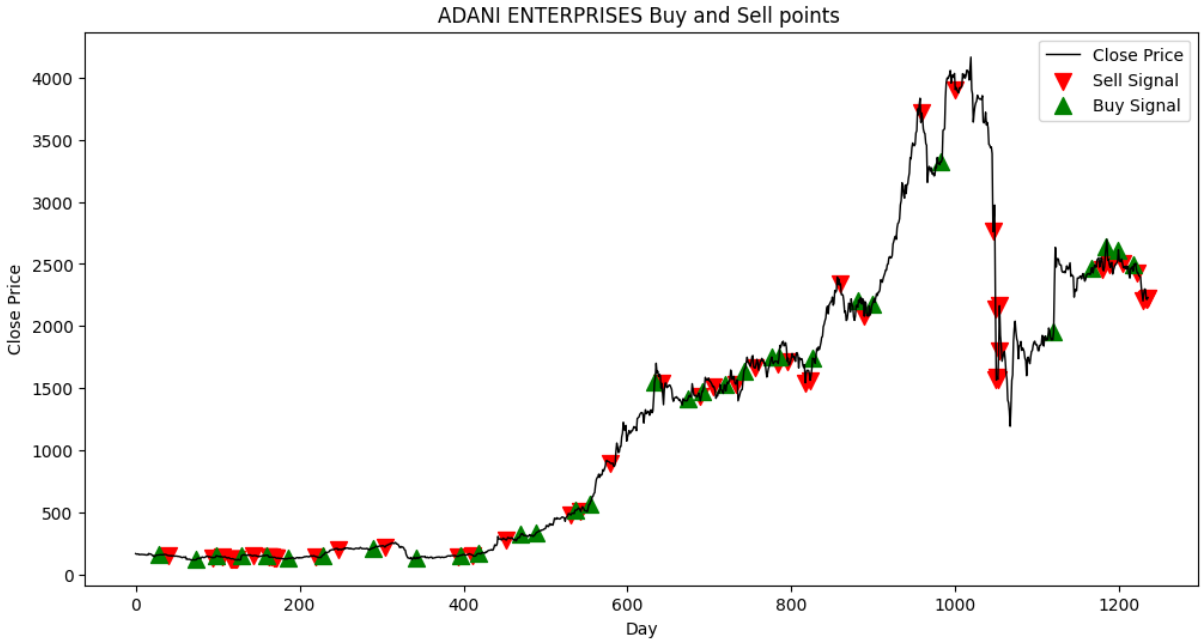


the number of executed trades:59
win ratio:0.50
loss-making trades:29
largest loss-making trade:-304625.543
largest profit-making trade:415631.72



Constant volatility of the graph makes my strategy works on it as well.

- **Adani Enterprises(ADANIENT.NS):**



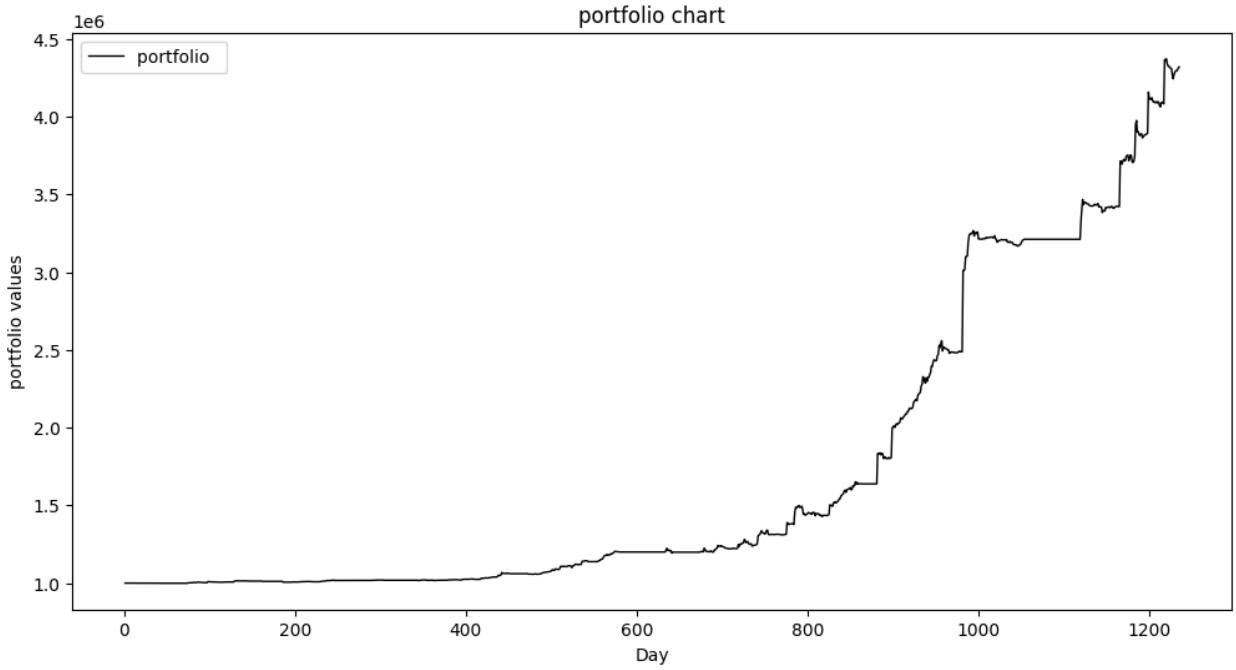
the number of executed trades:56

Loss making trade:29

win ratio:0.48

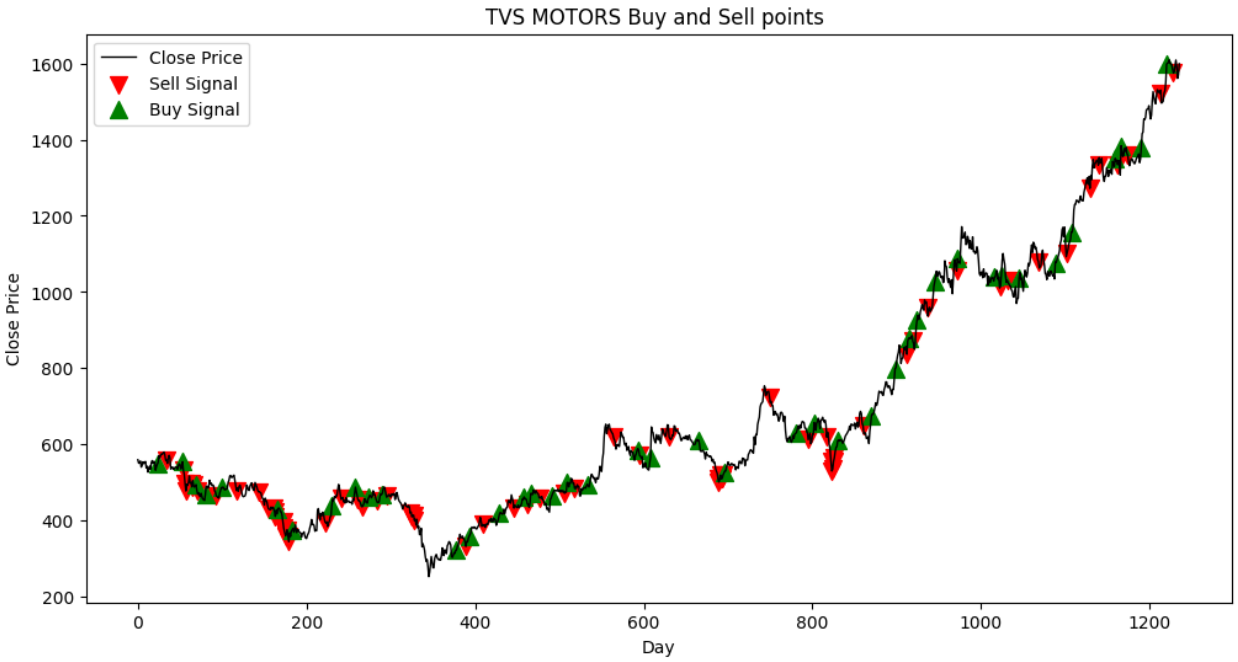
largest loss-making trade:-19387.30

largest profit-making trade:404394.52

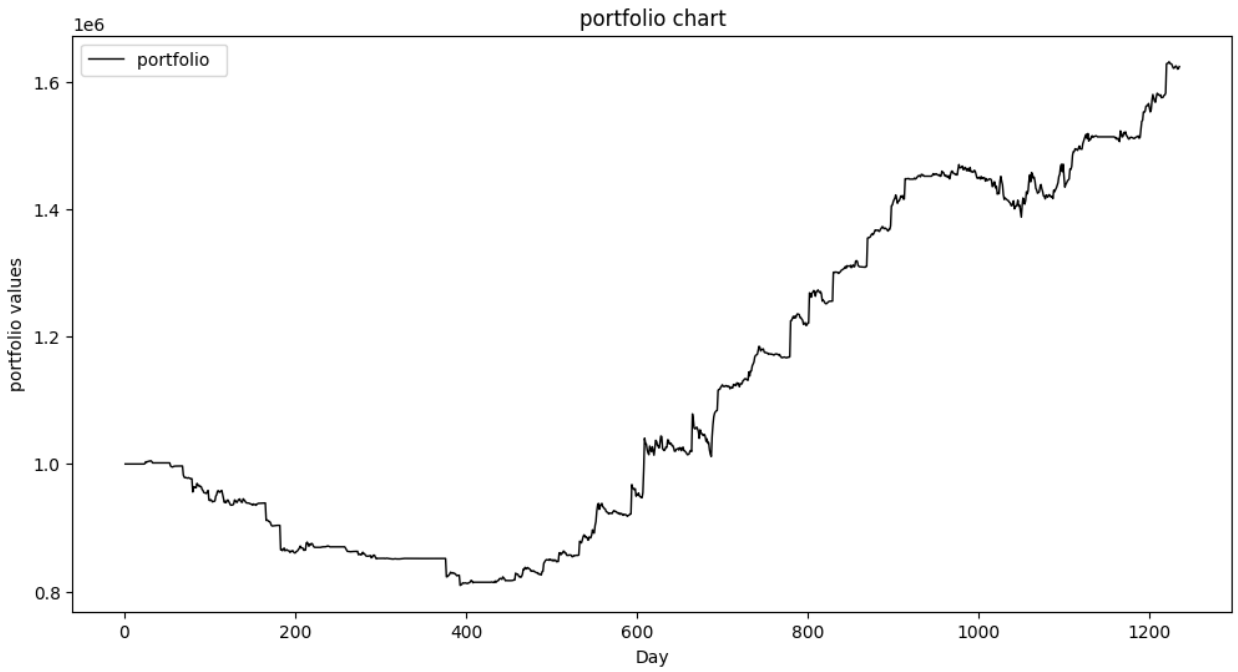


Probably one of the most volatile stock in the market and sharp uptrend and downtrend makes it very suitable for my strategy.Although you might be worring about the constant line in the start but I a not i expected that because of the initial very slow uptrend of very long duration just make the strategy less suitable initial what I want to show is the time when it volatile .

- **TVS MOTORS(TVSMOTORS.NS)**:



the number of executed trades:79
win ratio:0.37
loss-making trades:48
largest loss-making trade:-6432.68
largest profit-making trade:48402.77



I want to especially show this stock and want to provide better understanding of my strategy. In this stock you can see the very slow downtrend initial and then uptrend which is also slow.So just to showcase and highlight once again my strategy is less applicable on the stock that are less volatile.

4)Results: In this I am giving the final result of Sharpe ratio, annualized return, benchmark return, maximum drawdown.

Results	**TCS**	**BAJAJ FINANCE**	**ADANI ENTERPRISES**	**TVS MOTORS**
Sharpe ratio	**1.706**	**1.614**	**1.68**	**0.61**
Returns	**589022.55**	**3037648.92**	**1018305.32**	**283812.96**
ROI	**58.92**	**303.76**	**101.83**	**28.38**
Annualized return	**40.82**	**53.65**	**33.99**	**10.18**
Benchmark return	**772165.92**	**2141264.85**	**12233531.45**	**187576.92**
Drawdown	**0.11**	**0.26**	**0.04**	**0.19**
Portfolio value	**5538511.07**	**8564949.06**	**4320315.58**	**1623961.95**

5)**FURTHER DEVELOPMENT:**

In my strategy I am using the RSI indicator just to find the overbought and oversold condition but it can be of more use which can make my strategy more useful .Let's see how !

In my strategy if a particular stock remains in an overbought or oversold region for a longer period of range then at that point my strategy wont work efficiently it won’t give any signal for buy and sell . But RSI can be helpful in

this case it can be used as a trend reversal when it remains in an overbought and oversold region for a little longer duration of the time .
I can also use a stochastic oscillator as a trend reversal when there is divergence between the price and the Stochastic Oscillator. When the price of the asset is moving in one direction , making higher highs or lower lows, but the Stochastic Oscillator is moving in the opposite direction, it can signal a potential trend reversal.
In other words my strategy lacks for stocks having a long duration of up or down trend, So In this case i can use trend reversal technique by any of the two indicators .Thus my technique works best for those stocks having more volatile RSI value .

6)Insights gained:
Creating various combinations of indicators allowed me to gain a comprehensive understanding of how these tools function as a collective unit. For example,once on pairing the Relative Strength Index (RSI) with trend indicators, I uncovered how it can generate signals for a trend momentum strategy. Additionally, I discovered that employing similar types of indicators can help mitigate the occurrence of false signals. This insight led me to prefer a momentum trading strategy.

Through the process of completing this project, I deepened my knowledge of RSI and stochastic indicators,with MACD viewing them holistically. I learned how crossovers work , how they actually tell that there is an uptrend or an downtrend. I learned how RSI and stochastic indicators can identify overbought and oversold conditions, facilitate trend reversals, and serve as effective tools for confirming pinpointing entry and exit points in trading .I found immense satisfaction in the journey, ultimately expanding my proficiency in these essential tools for technical analysis, despite the hours i had put to learn how strategy can be formed with the combination of multiple indicator.

And also by writing the code for the indicator calculation i gained the knowledge how indicators are calculate and what does these calculation in deriving indicator means.

7)SUMMARY:

To summarize my strategy i would like to mention that in market future mimic the past , whatever the trends dependent things that had happened in the past will repeat for sure and using this only i had created the strategy for volatile stock having short term trend.This project mainly focuses on three indicator RSI,Stochastic,MACD with and as anyone would have guesses that my strategy is momentum based and by using indicator of close kind i had tried to remove the false signals that can be generated in any other strategy .And in my strategy i am also using dynamic buying of the stock not fixed value of stock is bought every time along with the stop losses that will be checked to minimize the losses that might occur.

With the the help of MACD indicator i had calculated trend and i tried to minimize the lag thus i didn't use EMA crossover so it help me giving trend signal for buy and sell and the strength of the trend is confirmed by RSI and stochastic indicator .