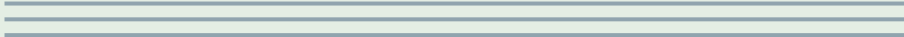# Options Algorithmic Trading

A Systematic approach in NSE Option market while using statistical model with option chain data.
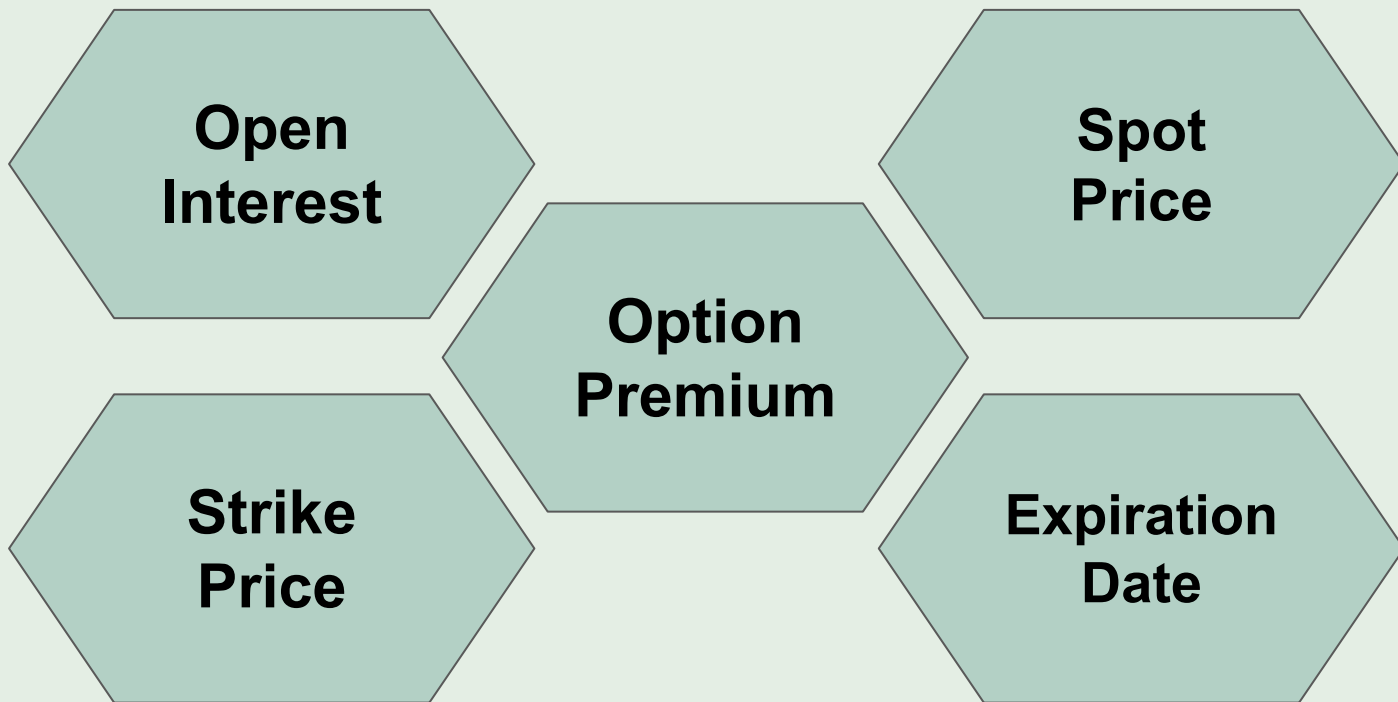
Problem Statement

What are Options?

	TYPES OF OPTIONS CONTRACTS	
	CALLs	**PUTs**
BUYER / HOLDER	**BUY CALL** The right to BUY	**BUY PUT** The right to SELL
SELLER / WRITER	**SELL CALL** The obligation to SELL	**SELL PUT** The obligation to BUY

Options Terminology

Open
Interest

Spot
Price

Option
Premium

Strike
Price

Expiration
Date

Moneyness of Options

Strike Price	Calls	Puts
3500	ITM	OTM
3750	ITM	OTM
4000	ATM	ATM
4250	OTM	ITM
4500	OTM	ITM

Technical Indicators Used

Simple Moving Average

Volume Weighted Average Price

Relative Strength Index

Put Call Ratio

Average True Range

SuperTrend

Strategy - Long CALL/PUT

- Long in stock market means that "you own the option"and bought the option at the current market price.

- After some days is the market actually goes as per our prediction we can sell the option and book the profit but if the market goes against our prediction we lose the premium that we paid.
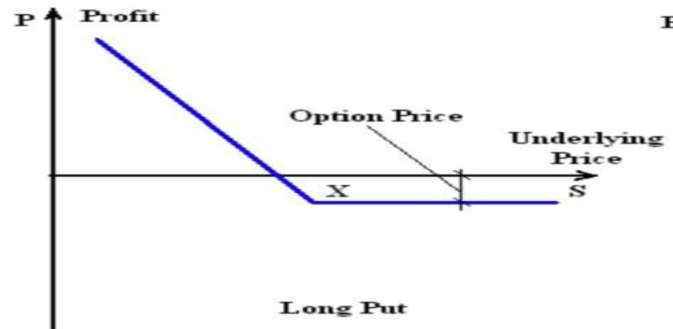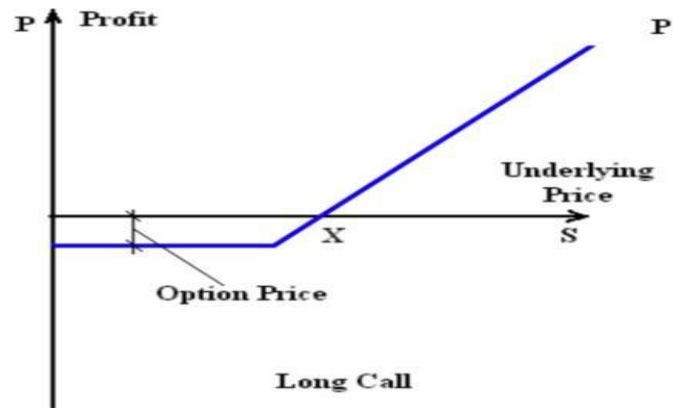
Outcome for Long CALL/PUT

- We can see that using our Long
  Call/Put Strategy we got 18% and
  13% ROI for BankNifty and Nifty
  respectively.

Strategy-1 Long Call/Put
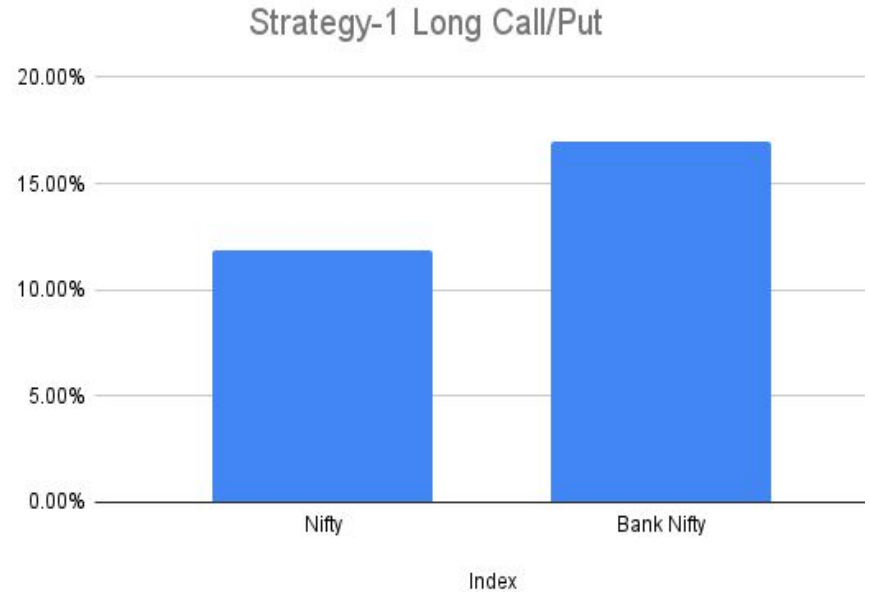
Strategy Long Straddle

- Long Straddle is combination of our previous strategies here we have both positions "Long Call" and "Long Put" at ATM.

- Here we can enjoy maximum profit irrespective of the direction and loss will be the premium paid for both the options.

- *Points to note:*
- Both options should be of same strike price.
- Both options should be of same expiry.
- Both should be at ATM position.

Variants of Long Straddle

Expiry Date

- Earlier we used to exit it before 3:30 pm on the same day.

- There are expiry days like weekly(Thursdays) and monthly(Last thursday of that month) expiry.

- So we hold our position till the expiry date.
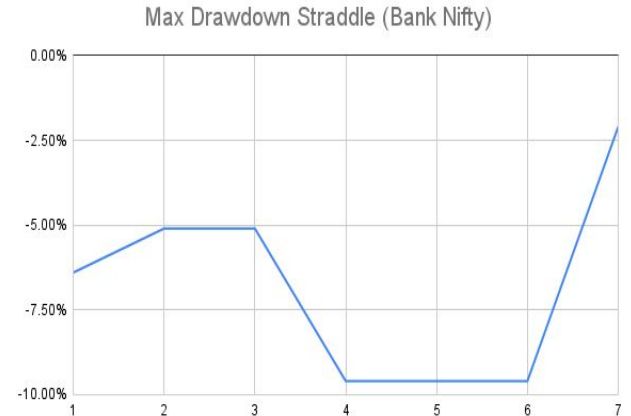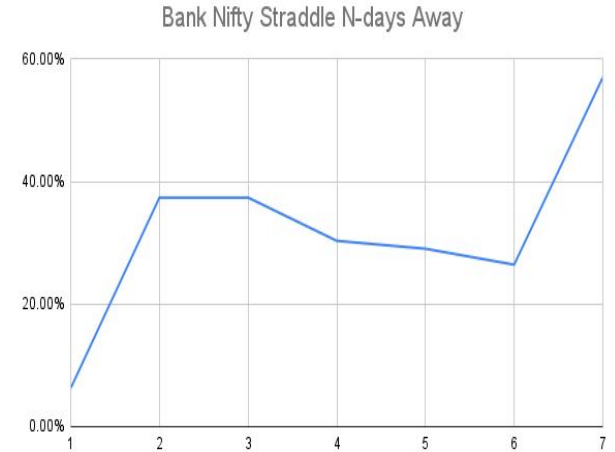
Nifty

- We know that Nifty index has the top performing companies in it.

- So if there are any major events occurring in any of those companies this might be a good time take Long Straddle Position.

Bank Nifty

- We know that BankNifty has shown high volatility during some major government bodies event like RBI, Federal Bank.

- So there can be high volatility during those event as there can be important decision take.

Outcome Long Straddle (Bank Nifty)

- Using our variant of Long-Straddle on the Bank-Nifty Index(Event day) we have seen an ROI of 60% when we take position 7 days before the event.

- We can conclude that taking 7 days as parameter we are getting the least Max-Drawdown.

Bank Nifty Straddle N-days Away

Max Drawdown Straddle (Bank Nifty)

Outcome Long Straddle - (Nifty)

- Using our variant of Long-Straddle on the Nifty Index(Event day) we have seen an ROI of 58% when we take position 7 days before the event.

- We can conclude that taking 7 days as a parameter we are getting the least Max-Drawdown.

Nifty Straddle with N-days away

Max Drawdown for Straddle (NIFTY)
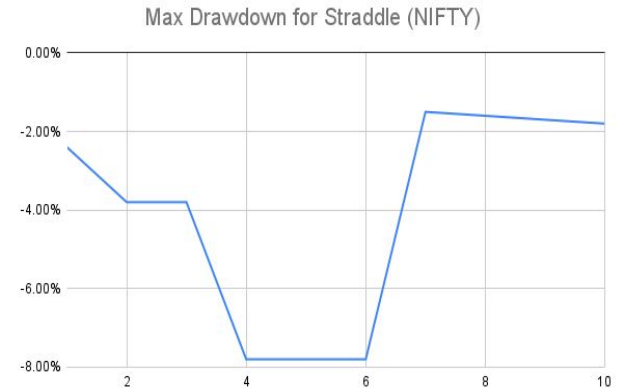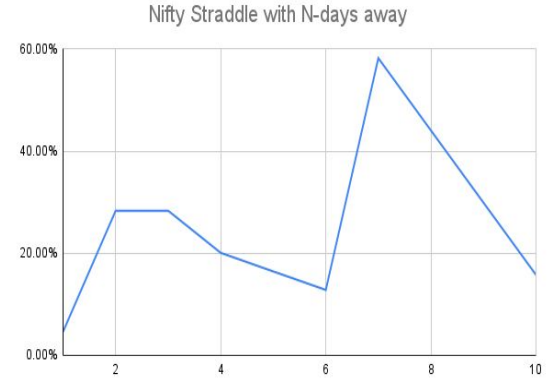
Strategy - Short Straddle

- Short in stock market means that "you do not own" and you sold the option at a the current market price.

- Here we might encounter unlimited loss as the market can go infinitely high and we can only enjoy the premium received as the profit.

- *Points to note:*
  - Both options should be of same strike price.
  - Both options should be of same expiry.
  - Both should be at ATM position.
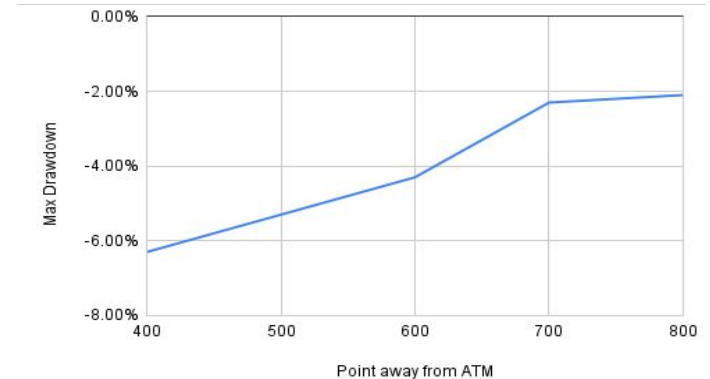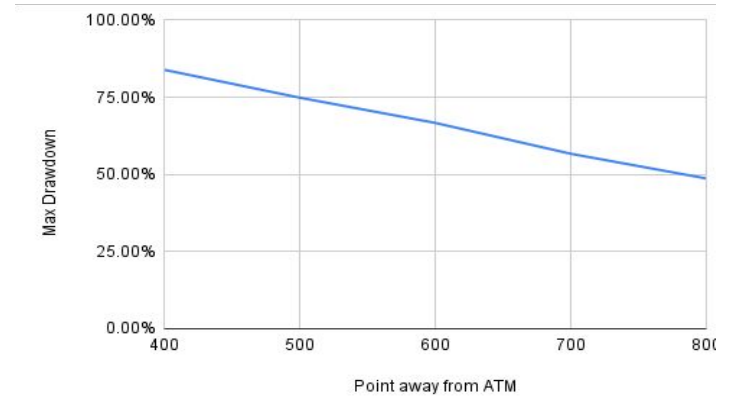

Short Straddle

Strategy - Short Strangle

- A short strangle consists of one short call with a higher strike price and one short put with a lower strike. Both options have the same underlying stock and the same expiration date, but they have different strike prices (OTM).
- As we know Earlier we used to take position in ATM this demanded higher premium but here we take position at OTM this is way cheaper than ATM.
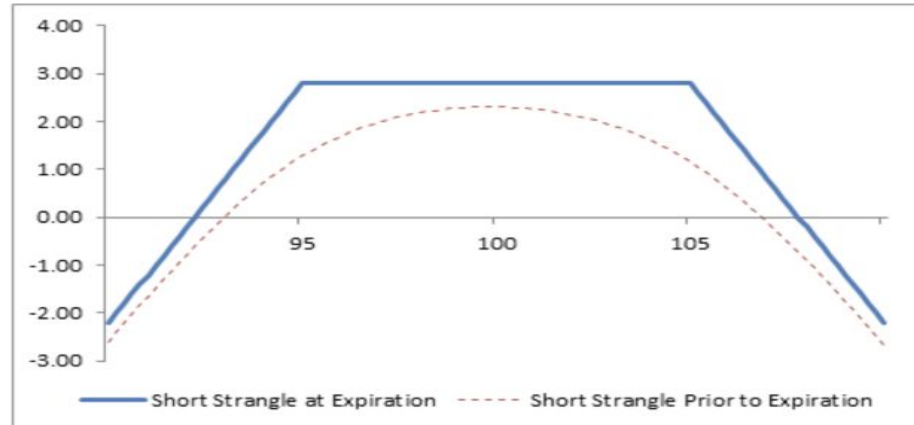
Output Short Strangle (Bank Nifty)

- Using our variant of Short-Strangle on the Bank-Nifty Index(Profit booking) we have seen an ROI of 80% when we take position 400 points away from OTM but we see a high Max Drawdown.

Output Short Strangle (Nifty)

- Using our variant of Short-Strangle on the Nifty Index(Profit booking) we have seen an ROI of 12.50% when we take position 100 points away from OTM but we see a high Max Drawdown.
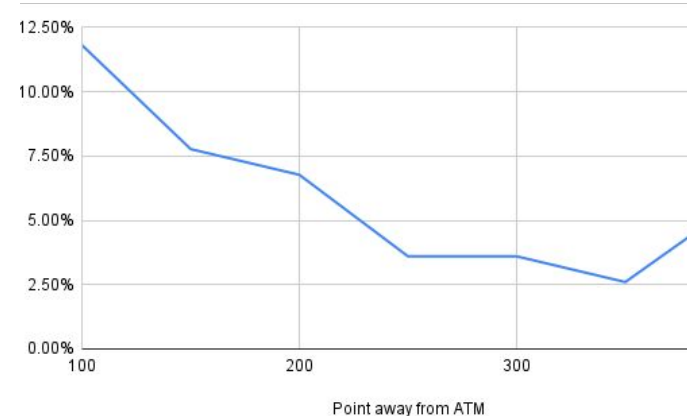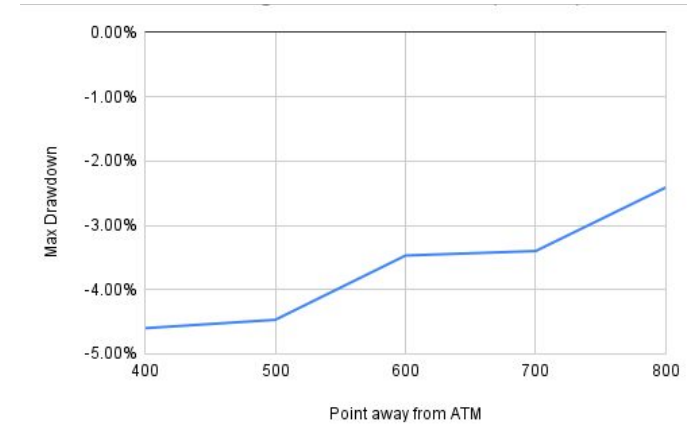
Variants of Short Strangle

Profit Booking

- So, as we know we might have to bear high losses so to avoid this or to overcome this loss we decided to exit the trade as soon as we have a 40% profit on the price that we sold the option.

- As we know, we must take position at equal points away from the ATM. We tried different points to take position.

Exiting On Loss

- So, as we know we might have to bear high losses so to avoid this or to overcome this loss we decided to exit the trade as soon as we have a hit loss on either of the options.
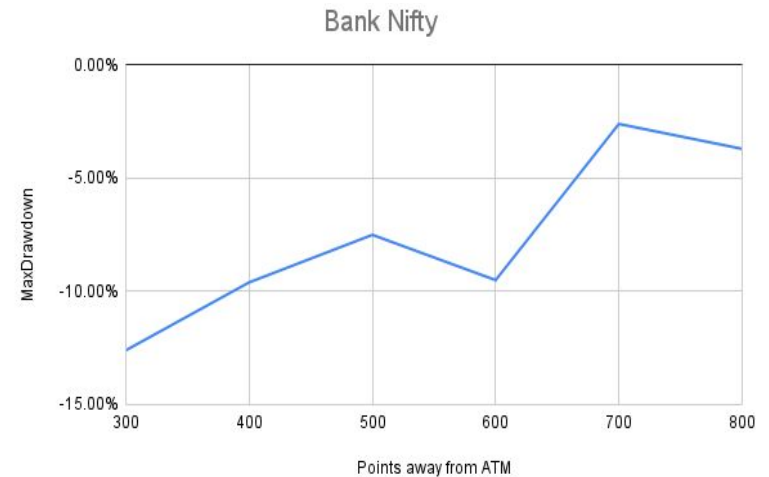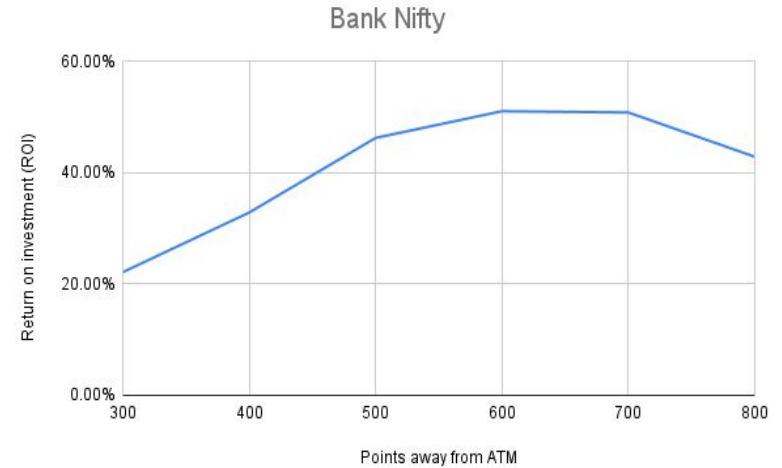
Delta Neutral

- As OTM have a range of (0.3-0.4) of delta value so we have to keep the position Delta neutral i.e.

Call Delta+Put Delta=0

- For Adjustment we keep calculating the delta as soon as there is a fluctuation we exit that leg and take another position.

Output for the Delta Neutral Strategy

THANK YOU