Kriti Trading Strategy Challenge with Options Data

LOHIT HOSTEL

Problem Statement

Building a BANK NIFTY price prediction model and trading strategy based on options data.

DATASET DESCRIPTION:

The given data set consists of historical options data for the BANK NIFTY, spanning over a period of the last 6 months from July 2023 to December 2023.

The given data set includes:

- Date
- Open
- High
- Low
- Close
- Strike price
- No. of contracts
- Open interest
- Change in open interest

Understanding Options and Option Chain

ANALYZING OPTION DATA

- **Option Chain:** An option chain is a comprehensive listing of all available option contracts for a particular security, presenting a snapshot of the available call and put options across various strike prices and expiration dates. It serves as a crucial tool for options traders and investors, offering essential information for decision-making regarding buying, selling, or exercising options.

- **Open Interest:** Open interest represents the total number of outstanding option contracts for a particular strike price and expiration date. It provides insights into market activity and sentiment by indicating the number of contracts that have not been closed or exercised.

In summary, open interest is a valuable metric derived from the option chain data, providing traders and investors with insights into market sentiment, liquidity, and potential price movements, thereby aiding in informed decision-making in the options market.

TRADING STRATEGY

RATIONALE BEHIND THE STRATEGY

Overview:

- Our trading strategy focuses on analyzing trends in call and put open interest (OI).
- An increase in open interest suggests that more contracts are being traded. Specifically, an increase in open interest indicates that the number of option contracts bought.

Strategy Approach:

- The open interest (OI) of call options that are in-the-money (ITM) typically indicates bullish sentiment and open interest(OI) of put options that are in-the-money indicates bearish sentiment.
- When call in the money (ITM) open interest exceeds call out of the money (OTM) open interest, it suggests that traders are positioning themselves for further upward movement in the underlying asset's price, reflecting a bullish sentiment in the market and the same condition for put option reflect a bearish sentiment.

TRADING STRATEGY

STRATEGY LOGIC AND SIGNAL GENERATION METHOD

- Choose current market price option five strike prices above it as in-the-money (ITM) options and five strike prices below market price as out-the-money(OTM).
- Calculate the total value of [call oi-put oi(ITM)]-[call oi-put oi(OTM)] over the 4 most recent expiry dates.
- The strategy's method of **weighing recent data** more heavily than older data (by applying decreasing weights from 4 to 1 over the 4 most recent expiry dates) aligns with the common financial principle that more recent information is more relevant. This approach helps in smoothening out the data and focusing on the most impactful, recent changes in open interest, thereby making the signals more responsive to the latest market sentiments.
- Upon weighting the final data, a **buy or square-off signal is generated** based on the resulting net value. These signals guide trading decisions, informing whether to enter buy or square-off positions in accordance with the prevailing market sentiment.
- After calculating the difference between the closing prices of the at-the-money (ATM) call and put options, **a buy or square-off signal is confirmed** if the difference value falls within a specified threshold range.

RISK MANAGEMENT MEASURES

- The strategy's method of **weighing recent data** more heavily than older data (by applying decreasing weights from 4 to 1 over four days) aligns with the common financial principle that more recent information is more relevant. This approach helps in smoothening out the data and **focusing on the most impactful, recent changes in open interest**, thereby making the signals more responsive to the latest market sentiments.

- The specific thresholds are set to ensure that only significant shifts in market sentiment trigger a trade. This helps in filtering out noise and focusing on substantial changes that have a higher probability of forecasting market movements accurately.The condition that both weighted close prices of calls and puts must be below a certain level to trigger a sell signal introduces a layer of **risk management**

- In the scenario of a major drawdown with the above strategy, an automatic constant stop loss, for example, 2%, is triggered based on one's risk appetite. This mechanism serves to limit potential losses by automatically exiting positions if the market declines beyond the predetermined threshold, aligning with the individual's risk tolerance.

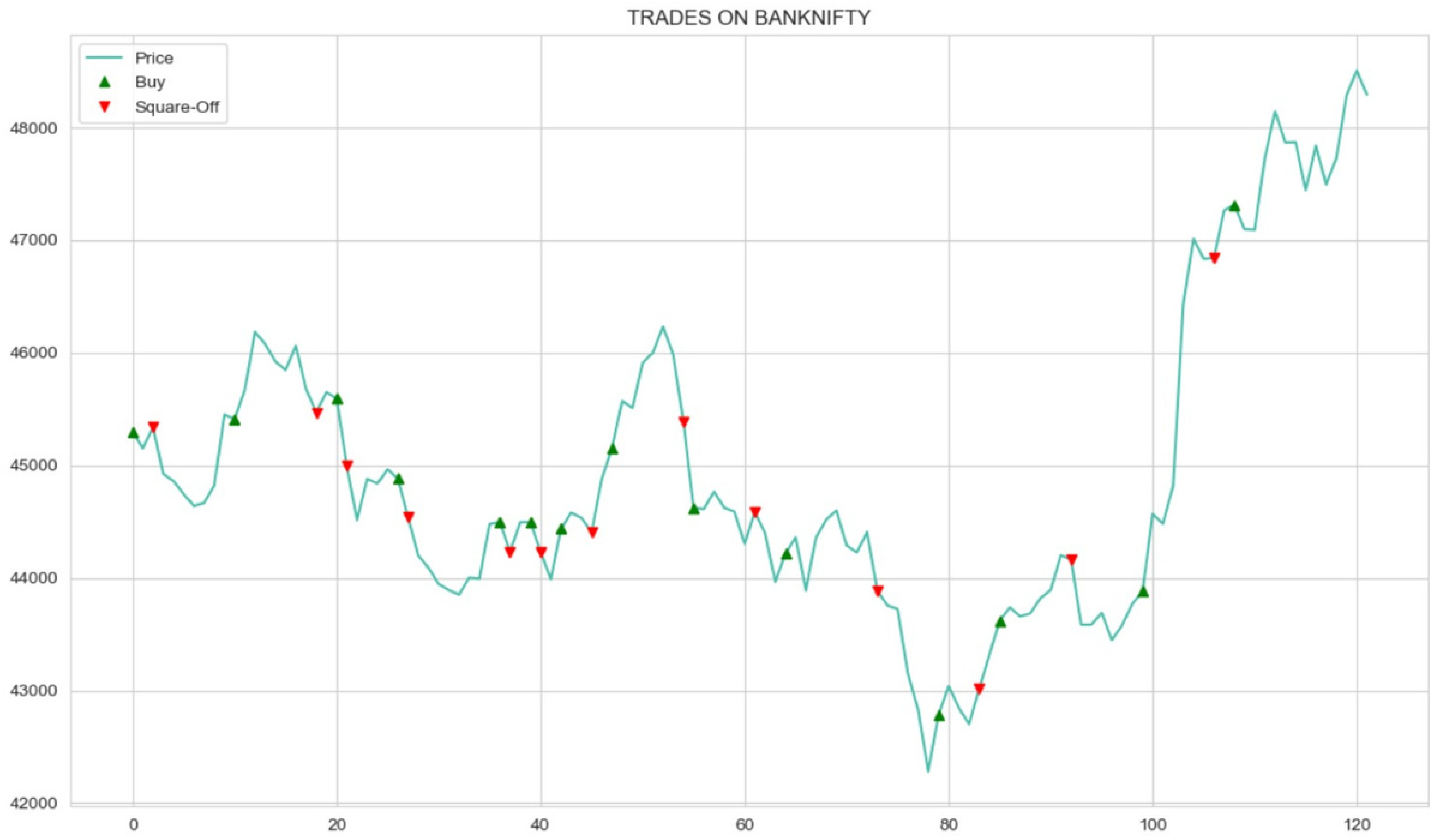
STRATEGY EXECUTION

- Upon the generation of a buy signal, a trade is initiated whereby the index is purchased on the subsequent trading day. The position is held until a sell signal is generated.

- In the event that a buy signal is generated on the current day and a long position is established on the following day, and another buy signal occurs on the next day, the existing long position is retained. This strategy entails holding the index until a sell signal emerges, maintaining the long position through successive buy signals.

BACKTESTING AND PERFORMANCE METRICS

- The strategy underwent backtesting from **July 3rd 2023 to December 27th 2023** and yielded significant **returns of 14.6%**. In comparison, the buy-and-hold benchmark achieved a return of 7.05%. Consequently, the strategy **outperformed the benchmark by 7.55%**, indicating its effectiveness in generating superior returns during the specified period.
- Average profitable trade return is 1.54%.The **best trade** within the backtesting period achieved a **maximum return of 6.7%**, indicating the highest profit realized from a single trade. Conversely, the maximum loss experienced on a trade was **1.31%**, signifying the greatest decrease in value incurred from a single transaction.As the average return on profitable trades exceeds the largest loss incurred, it indicates that the efficiency of this system is good.
- Number Of Trades taken are 14 during the backtesting period.



Thank You