Trading Strategy Challenge with Option Data

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Data Pre-Processing

- Missing Data : There was no Option price data on the day of 5th May, and 12th Nov there was only “Mohrat Trading”, hence all the corresponding entries were removed.
- Few Datatypes like Underlying Value, Close, Number of Contracts were of String data type which were consequently changed to Float.

Analysis and insights from Option Price Data

- Implied Volatility was calculated using BSM. Then the calculated IV was smoothened using 21 Day EMA. Including IV in our model allows us to capture market expectations by future volatility.
- Option Greeks were calculated for analyzing the sensitivity in Underlying asset's price using IV data.
- PCR provides insights into market sentiment.

Strategy logic and signal generation method

- Created a target Column named movement describing the short index movement (3 Days).
- Used Models like Naive Bayes Classifier, SVM, XGBoost, AdaBoost, Random Forest for generating signals.
- Predictions of day x are used to buy the stock on that day, and sell it after 3 days(we are predicting short term 3 day movement)
- Training Data uses At the money options with expiry of 1 week.

Timeline of Strategies

Using Ensemble Model Selling on next day after buy signal is generated

Returns	3.74%
Accuracy	45%
Buy and Hold	6.94%
Number of Trades	21
Sharpe	0.52
Hold Sharpe	0.64

Using Short-Term (3 Day) Movement

Returns	12.18%
Accuracy	65.0%
Buy and Hold	6.94%
Number of Trades	20
Sharpe	1.51
Hold Sharpe	0.64

Including Risk Management

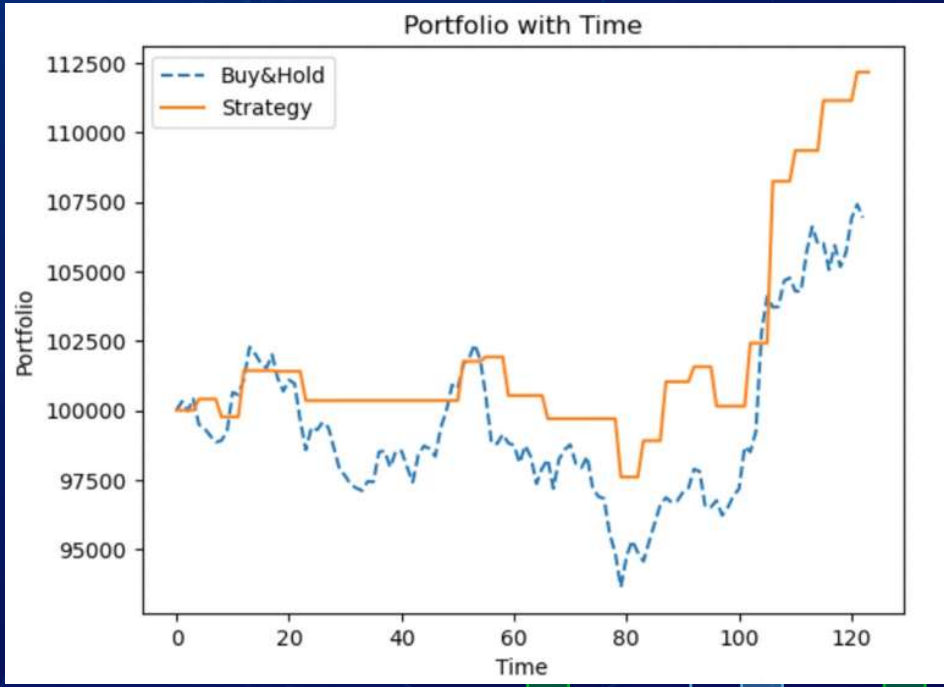
Returns	10.34%
Accuracy	57.14 %
Buy and Hold	6.94%
Number of Trades	21
Sharpe	0.87
Hold Sharpe	0.64

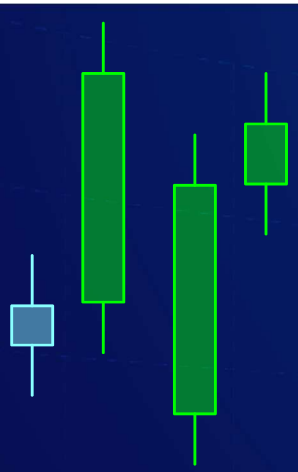
Risk Management Measures

- A time-based stoploss(tsl) is employed, where the asset is sold after 3 days if condition is not met.
- Additionally if on a particular day before the timed stoploss the price is as such that a stoploss value has been hit, the asset is sold on that day.

Strategy Backtesting

- We are using 45 day rolling window for training data.
- We are using long only strategy(if our prediction is ‘1’ on day x , then we buy on day x and sell 3 days later)





Thank You!