Indian Institute of Technology Guwahati

KRITI '24

Trading Strategy Challenge with Options Data

(Low - 250 Points)

Organizer
Finance & Economics Club
IIT Guwahati

Trading Strategy Challenge with Options Data

250 Points

Start : 05 /02   End : 10/02

Background:

In the realm of financial markets, creating effective trading strategies is a demanding task that requires a deep understanding of market dynamics. Traditional strategies often rely on historical price data and technical indicators, but the integration of options price-volume data offers a unique perspective for crafting innovative and informed trading strategies. The Trading Strategy Challenge with Options Data invites participants to explore the potential of options market insights to design robust trading strategies specifically tailored for the NIFTY BANK market index

Challenge Overview:

This problem statement challenges participants to develop and implement trading strategies focused on the NIFTY BANK index, utilising options price and volume data. The objective is to encourage the creation of sophisticated strategies that capitalise on the information embedded in options markets to optimise trading decisions related to index movements.

Problem Statement:

Key Objectives-

1. Data Acquisition and Preprocessing:

- Participants will be provided with historical options data for the NIFTY BANK index, spanning over a period of 6 months from July 2023 to December 2023.
- The dataset will include detailed options price and volume data, encompassing information on call and put options for various strike prices and expiration dates related to the index.
- Additionally, they will also be provided with the price-volume data of the underlying index for the specified timeframe.
- Participants should clean and preprocess the provided data by handling missing data, adjusting for splits, etc. Additionally, any data transformations may be done and new features can be created.

2. Strategy Objectives:
- Design trading strategies which make use of mathematical and statistical models to generate robust trading signals.
- Participants should focus on identifying insights into index movements using the options data and analyse correlations between the two.
- Various types of quantitative approaches can be considered such as trend-following, mean-reverting, momentum-centric, etc. Participants may use methods such as indicator signals, machine learning, etc.

3. Risk Management:
- Focus on implementing risk-management measures to reduce market overexposure and limit losses.
- Participants may look into incorporating position sizing, stop-losses, time-based stops and other various techniques into their strategies.

4. Backtesting:
- Participants can implement the strategy logic via code and generate trading signals.
- These trading signals are to be backtested on the price-data of the BANK NIFTY index and the strategy performance and results should be documented.

5. Documentation:
- Participants must submit comprehensive documentation outlining their trading strategy, rationale based on insights gained from options price-volume data, strategy logic and backtesting results.
- Highlight the results and performance of your strategy using charts and graphs.

Submission Requirements:
Participants are required to submit the following deliverables:
1. *The file(s) consisting of the code used for data preprocessing, implementation of strategy logic, generation of trading signals and backtesting results.*
2. *A presentation/report has to be made as documentation of the strategy. The presentation should be in line with the following template:*
   - Analysis and insights from option price data, along with rationale behind the trading strategy
   - Strategy logic and signal generation method
   - Risk management measures
   - Strategy execution and backtesting
   - Performance metrics

Guidelines:
- For backtesting the strategy, participants must clearly state their assumptions such as starting capital, capital invested per trade etc.
- Participants are encouraged to use programming languages such as Python for their implementation. External libraries and other tools may also be used for data analysis and visualisation.

Evaluation Criteria:
- Data Insights and Strategy Logic: 30%
- Strategy Implementation and Code Quality: 20%
- Risk Management Measures: 5%
- Backtesting Results and Strategy Performance: 10%
- Documentation and Data Visualization: 15%
- Presentation and QnA: 20%

General Rules:
1. **Who can participate:**
- The Participating team can have maximum of 4 members which should include at least one fresher.
- The Core Team Members of Finance & Economics Club cannot participate in this PS.
2. **Penalties**
- Violations of rules will result in a deduction of 50% of the total points for the Hostel
- Penalty for late submission will be as follows:
    i. For every minute of late submission, 1% of points will be deducted for each minute for the first 15 minutes.
    ii. 20% of the points will be deducted if submission is between 15 to 30 minutes.
    iii. 50% of the marks will be deducted if submission is between 30 to 45 minutes.
    iv. 75% of the marks will be deducted if submission is between 45 to 50 minutes.
    v. After 60 minutes there will be no submission.

This challenge aims to stimulate the development of advanced index trading strategies using options price-volume data, fostering a deeper understanding of market dynamics and risk management among participants. **Good luck!**