

Assignment-2 (MID-EVAL)

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INSTRUCTIONS

1. Please Read the Problem statement carefully; you have to be mindful of the conditions given.
2. Plagiarism will be highly penalized.
3. Carefully read the structure of deliverables.
4. The assignment is supposed to be done in a team of two for a more thorough understanding.
5. You are encouraged to take help from the internet but avoid directly copying the complete code. And also don't use **TaLib** directly.

GOOD LUCK!

Objective: The objective of this assignment is to develop a trading strategy using technical indicators for both small cap and large cap stocks listed on the National Stock Exchange (NSE) in India. Working in teams of two, you will code one out of each bucket of five volatility and five momentum based technical indicators in Python, generate trading signals, backtest the strategy over a two-year period, and analyze the results. Additionally, you will investigate the strategy's shortcomings, propose improvements, and explore the potential of incorporating additional indicators for better performance.

Assignment Tasks:

1. Designing the strategy:

- a. Learn about the indicators chosen from the bucket.
- b. Implement the indicators in python using appropriate plots and symbols and generate trading signals based on predefined rules.

2. Signal Generation and Backtesting:

- a. First, use both of the strategies alone and combine the momentum based and volatility based indicator strategies for both small cap and large cap stocks. (You have to come up with your own strategy for combining the indicator. Ex. combining MACD and Bollinger Band For taking trading on a defined metric instead of using only one).
- b. Generate buy/sell signals based on the strategies and apply them to the historical price data.
- c. Simulate the trades and calculate the stock returns.

3. Performance Analysis and Inferences:

- a. Evaluate the performance of the strategies by calculating various performance metrics like returns, sharpe ratio etc.
- b. Compare the performance of the Momentum and Volatility indicator strategies individually and combining each other.
- c. Interpret the results and discuss the strengths, weaknesses, and limitations of the strategies.

4. Analysis Report:

- a. Clearly outline the contributions of each team member in terms of coding, strategy formulation, and analysis.
- b. Prepare a comprehensive report documenting the approach, coding implementations, backtesting results, analysis, inferences, and proposed improvements.
- c. Present the report in a well-structured manner.

Deliverables:

1. Well-documented Python code for the Momentum and Volatility based indicators, plots, signal generation, performance metrics and backtesting.
2. A detailed report summarizing the assignment tasks, including approach, findings, inferences, proposed improvements, and individual contributions of each team member.

Note: The assignment provides an opportunity for both team members to collaborate, divide tasks, and contribute to the project's different aspects. It is essential to emphasize effective teamwork, clear communication, and equal participation.

The indicators should be chosen from the given bucket. Take the mod of the last digit of your roll no. with 4 to get an index for the indicator from the given table for both the team members. (Ex. 211175 and 210813 will select 2nd Volatility indicator and 4th momentum indicator)

Volatility Indicator	Momentum Indicator
Volatility Index (VIX)	Relative Strength Index (RSI)
Bollinger Band	Stochastic Oscillator
Keltner Channel	Average Directional Index (ADX)
Donchian Channels	Accumulation/Distribution Line (A/D Line)