Assignment-3

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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.

GOOD LUCK!

From the class, code and resources provided to you about Pair Trading Strategy, we believe you have the idea, now it's time to incorporate the same and make your own robust pair trading strategy.

Objective: The objective of this assignment is to analyze and implement a pair trading strategy using two stocks from the Nifty 50 index. You will be required to identify a suitable pair of stocks based on their correlation over the past year, collect historical data, implement the strategy, evaluate its performance, and optimize it using various measures.

Correlation Analysis:

To identify a suitable pair of stocks for pair trading from the Nifty 50 index, collect the historical daily price data for all stocks over the past year and calculate the correlation coefficients between each pair of stocks using the daily price returns. Create a correlation matrix to display the correlation values between all possible pairs of stocks, and analyze the matrix to identify a pair of stocks that exhibit a historically stable relationship suitable for pair trading.
Stock Selection:
Choose 2 stocks and Justify your stock selection by discussing the correlation values and other factors such as sector similarity, business fundamentals, or industry dynamics.

Pair Trading Strategy Implementation and analysis:

a. Calculate the spread between the prices of the two selected stocks using a suitable statistical method, such as the price ratio or z-score or anything other you find suitable.
b. Develop entry and exit rules for initiating and closing pair trading positions based on the spread.
c. Perform sensitivity analysis by adjusting critical parameters, such as entry and exit thresholds, lookback periods, or trading costs.
d. Analyze the impact of these parameter changes on the strategy's performance and discuss their implications.
e. Calculate key performance metrics to evaluate the effectiveness of the pair trading strategy, including - Cumulative returns ,Sharpe ratio ,Maximum drawdown.
f.Apart from this you are free to add any other thing to improve strategy or checking the effectiveness.

Deliverables:

1. python notebook of complete strategy and analysis, it is mandatory to add plots wherever necessary and generate signals properly.
2. A report (1-2 Page) stating why you have chosen a particular pair, and the result of sensitivity analysis.

Note:
Completely copying the code provided during the class is strictly not acceptable.