1. What is the logic behind your algorithms for ETH and BTC?

TWO TIME FRAME TESTING

This trading strategy combines momentum and trend-following indicators like Simple Moving Averages (SMA), loss momentum, and rolling maximum values to generate buy and sell signals for ETH/USDT. It uses a dynamic portfolio management approach, adjusting capital and tracking shares based on entry and exit signals. A dynamic stop-loss mechanism and a sideways market filter are employed for risk management, ensuring profitability while avoiding trades in flat markets. The strategy is backtested on both small and large datasets to evaluate performance, aiming for consistent returns while minimizing risk exposure.

BTC

Ensemble Strategy: We have implemented two strategies for BTC, first of it being an ensemble of indicators such as Marubozo, SuperTrend, Ichimoku Cloud, Average True Range. This trading strategy combines Marubozu candlestick patterns, SuperTrend, and Ichimoku Cloud to generate buy and sell signals based on momentum, trend, and market conditions. Key indicators such as the shadow (price range), the absolute open-close difference and a rolling average of 15 days with standard deviation adjustments help identify potential trade opportunities. The strategy employs a rolling stop-loss mechanism, dynamically adjusting based on the highest price observed during the trade. A sideways market filter, using the Ichimoku Cloud, detects flat conditions, while the Supertrend guides long entries and exits. By integrating momentum and trend-following signals with weighted averaging, the strategy makes informed decisions, tracking trades, and calculating profit or loss.

ETH

SuperTrend Strategy: The SuperTrend based trading strategy for ETH/USDT is designed to capture trends in the market by using a volatility-based indicator. This indicator calculates two dynamic bands: an upper band and a lower band, which are adjusted based on the Average True Range (ATR). Essentially, the strategy sets these bands a certain distance above and below the average price, with the distance determined by multiplying the ATR by a factor, which in our strategy is equal to 3. A buy signal is triggered when the price crosses above the upper band, signaling the start of an upward trend, while a sell signal is generated when the price drops below the lower band, indicating a potential downward trend. If the price moves back above the upper band, a position is closed. The strategy works well because it adapts to the market's volatility, helping to catch strong trends while avoiding false signals when the market is flat. This makes it a straightforward yet effective approach to trading ETH/USDT. We have implemented this strategy essentially because the ETH/USDT market was trending(up-trend and down-trend) for the years 2019-2023 and since this indicator specializes in trending markets, it seemed like a good choice to implement as a trading strategy.

2. What risk management practices were incorporated?

In the case of strategy 1 of BTC, we have implemented a dynamic rolling stop loss which uses the highest price achieved in the holding period of the stock. If the price falls a certain percentage (5%) below the highest price observed during the holding period, it automatically closes the trade and sets the position into a closing one or "square-off". We have also implemented a take profit level which is set at 10 percent above the trade entry price. This ensures that the profits are locked in when the price reaches a predefined threshold and this

prevents the strategy from giving back gains during market reversals. Another important risk management feature implemented is the Sideways Market Filter which uses components of Ichimoku Cloud. This filter identifies sideways or flat markets and in such conditions, limits the trading to positions near key support (Senkou Span B) and resistance level (Senkou Span A), thus avoiding trades in choppy/range-bound markets. Together these practices help balance risk and reward and protect against large losses while ensuring gains are captured in favourable market conditions.

3. What was the most crucial learning point during the entire problem statement preparation?

The main part of learning is resolving issues related to overfitting and finding the right logic within the strategy to achieve profitable results. It is important to stick to the basics and build our strategies from the ground up, rather than using advanced techniques before establishing a solid foundation.

While testing many strategies, we encountered overfitting due to various factors. We worked on resolving these issues by extensively testing them on random signals, ultimately developing a strategy that produced good results.

During the process, we worked together as a team and explored a bunch of new concepts like Kalman filters which have a wide range of applications. The sheer joy of learning such fascinating concepts was something truly amazing. We thank team Zelta for providing us with such an opportunity.