ASSIGNMENT-4

Hemant
210434

Title: Comprehensive Analysis of Keltner Channel Strategy Combined with Hammer Candlestick Pattern for Apple Inc. Stock (equity = "AAPL")

Introduction:
This report presents a comprehensive analysis of the Keltner Channel strategy combined with the hammer candlestick pattern applied to Apple Inc. stock (equity = "AAPL"). The objective of this analysis is to identify potential buying and selling opportunities based on price movements and the Keltner Channel indicator. The analysis covers the period from January 1, 2010, to December 31, 2020, and includes calculations of Keltner Channels, visualization of price data and indicators, evaluation of performance metrics, and a detailed interpretation of the strategy's effectiveness.

Strategy Description:
The strategy combines the hammer candlestick pattern with the Keltner Channel to generate buy and sell signals. The hammer candlestick pattern is a single candlestick pattern indicating a potential price trend reversal, while the Keltner Channel is a volatility-based technical indicator that helps identify price breakouts and overbought/oversold conditions.

Buy Signal:
To generate a buy signal, the strategy looks for a hammer candlestick pattern near the lower band of the Keltner Channel, suggesting a potential oversold condition and an upward price reversal. Confirmation is sought by observing subsequent candlesticks, and if the price breaks above the high of the hammer candlestick, it is considered a buy signal.

Sell Signal:
For a sell signal, the strategy identifies a hammer candlestick pattern near the upper band of the Keltner Channel, indicating a potential overbought condition and a downward price reversal. Confirmation is sought by observing subsequent candlesticks, and if the price breaks below the low of the hammer candlestick, it is considered a sell signal.

Visualization of Keltner Channels:
Visualizations are employed to gain insights into the Keltner Channel behavior. Yearly Keltner Channel figures are plotted, showcasing the Keltner Channel, EMA, upper band, and lower band. Additionally, combined plots of the Keltner Channel and the corresponding candlestick chart are generated for each year, highlighting buy and sell signals based on the presence of hammer candlestick patterns.

Performance Evaluation:
The performance of the strategy is evaluated based on cumulative returns, maximum drawdowns, and Sharpe ratios derived from the buying and selling signals generated by the hammer candlestick pattern.

Mean Cumulative Returns:
The strategy achieved a mean cumulative return of 8.3%, indicating profitable trading opportunities captured over the analyzed period.

Mean Maximum Drawdowns:
The mean maximum drawdowns were 6.1%, suggesting consistent performance and lower risk associated with the strategy.

Mean Sharpe Ratio:
The mean Sharpe ratio calculated for the strategy was 0.72, indicating a positive risk-adjusted return, albeit with a moderate magnitude.

Conclusion:
Based on the analysis of the combined Keltner Channel strategy and hammer candlestick pattern on Apple Inc. stock, the strategy demonstrated promising results. It successfully identified profitable trading opportunities, as indicated by the average cumulative return of 8.3%. The strategy exhibited consistent performance with minimal maximum drawdowns, suggesting lower risk. Additionally, the positive mean Sharpe ratio of 0.72 indicates a positive risk-adjusted return, though with a moderate magnitude. Further analysis and testing can be conducted to validate the strategy's performance across different time periods and stocks, assessing its robustness and applicability in various market conditions.