AI trading system team working process synthesis

Talking about “AI applied in trading system challenges,” what people have in mind might relate to specific mathematical puzzles or debatable codes in programming. Despite the fact that the above factors cover the most significant parts of the task. Macroeconomic perspectives are still required and needed.

The first thing about “AI applied in trading system challenges” is technical analysis, a security analysis discipline for forecasting the direction of prices through past market data, cost, and volume. It contains various concepts, including support and resistance, trend line, breakout, and market trend;

· A support level is the highest price level during a period of time. This means the price is more likely to “bounce” off this level rather than break through it. However, once the price has breached this level, by an amount exceeding some noise, it is likely to continue falling until it meets another support level.

· A resistance level is the opposite of a support level. It is where the lowest price level is during a period of time. This means the price is more likely to “bounce” off this level rather than break through it. However, once the price has passed this level, it is likely that it will continue rising until it meets another resistance level.

· A trend line is a line drawn over pivot highs or under pivot lows to show the prevailing direction of price. Trend lines are a visual representation of support and resistance in any time frame. They show direction and speed of price, and also describe patterns during periods of price contraction

· A breakout is when prices pass through and stay through an area of support or resistance. On the technical analysis chart a break out occurs when the price of a stock or commodity exits an area pattern.

· A market trend is a perceived tendency of financial markets to move in a particular direction over time. These trends are classified as secular for long time frames, primary for medium time frames, and secondary for short time frames.

Candlestick pattern is the next important thing relevant to “AI in trading systems”. In finance, a candlestick pattern is a moving trend in prices on any stocks shown graphically on a candlestick chart. Some people are using this chart in order to predict a particular market movement. Among all of the different patterns in candlestick pattern, Hammer pattern is the one used for this task at present. It is a type of candlestick pattern, the candle looks like a hammer, it has a long lower wick and a short body at the top of the candlestick with little or no upper wick. It can be found in price charts of financial assets. In order for a candle to be a valid hammer, most traders say the lower wick must be two times greater than the size of the body portion of the candle, and the body of the candle must be at the upper end of the trading range. When a hammer form candle shows up in a downtrend stock it is a sign of a potential reversal in the market. The advantage of this type of pattern is to provide a reversal signal which means the price reached the bottom. Especially in a downward trend, it could be suggestive that the pressure to sell off the stock is over. Also, it provides an exit signal for investors. Nevertheless, the disadvantage of this pattern is that it only considers a specific signal but ignores the overall trend. Sometimes, it could mislead investors to exit or enter the market.

MACD(moving average convergence divergence) is a trend-following momentum indicator that shows the relationship between two moving averages of a security's price. The MACD is calculated by subtracting the 26-period exponential moving average (EMA) from the 12-period EMA. Indicator can be used on MACD, it is a mathematical calculation that can be used with the stock’s price and/or volume to help make investment choices, they work by measuring how overbought or oversold a stock is.

Currently, the challenge is using math modeling and program codes to calculate and determine numbers in an excel format investment. Doing this could provide investors an idea of the correct time to enter the market and the potential of this investment. The excel recorded the open, high, low, and close price of this investment for each day in four years with specific numbers.

To determine MACD, hammer, support, and resistance among all numbers in excel, we used python for program codes. Support and resistance are the lowest and highest price of a time frame, with the lowest price in a week, it means that the price after this point is highest, and this is one of the support points. However, the following point's time frame can be determined because there is no limit to how many supports or resistance a stock can get in a time frame. All points followed by the highest or lowest sequence of prices are supposed to be found.

Next stage for the “AI in trading system challenge is to add some statistics such as probability calculations to the codes already made. Statistics include descriptive and inferential, and in inferential, it includes Bayesian and frequentist, which is the classic one. Bayesian inference is what we are about to use. It is a method of statistical inference in which the Bayes theorem is used to update the probability for a hypothesis as more evidence or information becomes available. Bayesian inference is an essential technique in statistics, and especially in mathematical statistics.

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