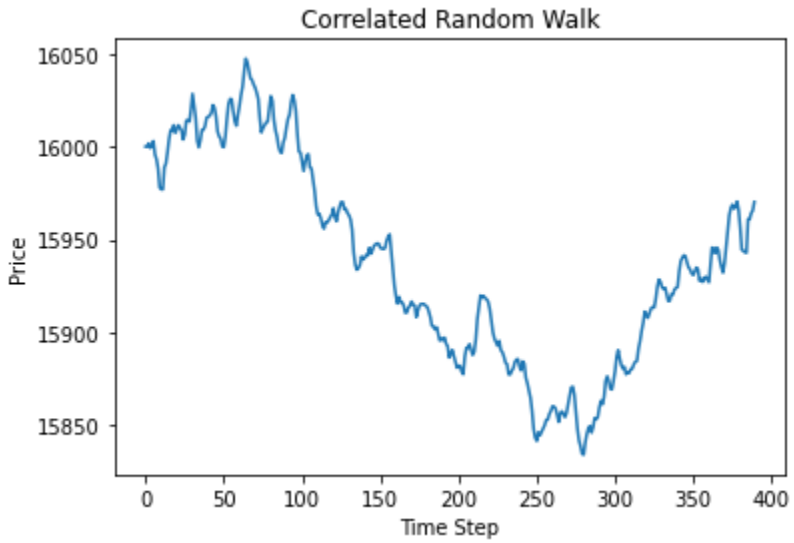
Correlated Random Walk -

Using methods from physics I investigated ways to simulate the movement of Nasdaq future (NQ). Here is one example of the simulation.



Utilizing minute-by-minute data spanning from 2008 to 2023, I have developed a statistical model that generates "Correlated Returns." The model is underpinned by the following formula:

$$C = (1/Correlation_x) * Return_{x-1} + (1 - (1/Correlation_x)) * RandReturn_x$$

This equation is crafted to capture the correlation of sustained momentum at any given minute within the time series. By employing a correlation coefficient specific to each minute ($Correlation_X$), the model intelligently accounts for the historical continuity of price movements.

An integral component of this approach is the use of filters to refine the dataset according to specific criteria and market conditions, such as analyzing the predictive patterns of Mondays following a gap up exceeding 0.2%. The flexibility of this model allows for the incorporation of resistance and support levels, calibrated with the probability of breaches based on historical parallels from analogous trading days.

The predictive capability of the model is grounded in market-generated data, enabling it to assimilate various market dynamics, such as overnight gaps. Consequently, it is equipped to forecast price movements by analyzing the interplay between support and resistance levels and other market factors, thereby providing a nuanced view of potential market behaviors.