**Laddering Momentum Trading Strategy Development Project Executive Summary**

The rotational momentum trading strategy selects the highest score ETF from a set of assets and holds it during the corresponding holding period, it is scored based on short term momentum, long term momentum, and short-term volatility.

Suppose you know the optimal holding period is 2 weeks, but afraid to hold an ETF position for that long. If you rebalance every week instead of every 2 weeks, the momentum performance will be suboptimal. However, the risk management team tells us that holding a position for 15 days exposes us to too much risk of asset crashing. We want to implement a risk management system by laddering the asset allocation along the time dimension and show its impact on the equity curve volatility. Doing this will atomize the risk for the ETF’s momentum trading system. To implement this, we would divide the capital in 2 halves (A and B), rebalance A on the first week and the third week, rebalance B on the second and the fourth week. This procedure can be applied to as many weeks or rungs as the holding periods, the investment capital will be split among the number of rungs. Before I had to be fully invested in each security for 2 full weeks to maintain the momentum, now I can be fully invested in 1 ETF for only 1 week. It is not the same as rebalancing every week since momentum needs at least 2 weeks to build up. It allows for bad ETF exposure reduction without killing the momentum and if an asset crash was to occur, it would only be risking a portion of the invested capital.

Our python code will be an adaptation of Lecture 6 – Rotational Momentum Program with Stop Loss (RotationalMomentumWFreqFunc.py). The user would need to input the stock\_list based on what stocks to use, frequency (holding period), offset (time delay between rungs), and the number of rungs. Everything else is calculated by the program, the for loop will iterate for each rung, changing start\_date each time and record the returns and index for each rung. After calculating the returns of each rung, we merge the returns together to determine the overall portfolio financial metrics such as the Sharpe’s ratio and volatility. We ran multiple runs with different numbers of rungs (1, 3, 6, 18 rungs), we can observe that by laddering our assets when using the momentum rotational program, we can reduce the volatility and increase the expected returns. From our observations, we see that more rungs do not necessarily mean more returns, this may be since this would have less investment capital to capitalize in a large asset return. However, we do see the volatility decrease as we add more rungs

In the future, we can improve this model by optimizing the holding period, lookback period, and the day of trading using the 3D Sharpe Surface program. We can optimize the weights assigned for short-term, long-term returns, and short-term volatility. Can incorporate the v-ratio to determine the strength of the trend and recalculate the score assigned to the assets. Adapt the rotational momentum program to trade automatically and independently of a bond ETF and a stock ETF, integrating all the equity curves as a weighted average, in which the client can choose how aggressive to invest. Can examine different classifying scores and other risk management strategies to see if it may yield higher returns. In conclusion, by implementing laddering into our rotational momentum strategy, we are able to significantly decrease the volatility by implementing more rungs (0.11 for single rung to 0.06 for 18 rungs, a 45% decrease).