## MGT 6081: Final Project Guidelines

The final project is a group assignment. Your first order of business is to sign up in one of the groups called “Final Paper” on canvas. Go to the people tab and you will see the groups. You can self-sign up into a group and therefore can choose whom you are working with. Each group is limited to 5 students.

Below I have highlighted a few project ideas. You are not required to follow the choices listed below. You may choose an idea of your own that is different. If you choose to have an independent idea, please discuss with me before you begin.

Your writeup should have the following broad categories:

1. **Introduction Section:** The writeup should have an introduction section. It should clearly specify and explain what you are trying to do and why you thought this direction is interesting to explore.
2. **Data:** Collect relevant data. Your project should have a component that uses actual data to some extent. Most data are available on Bloomberg. If you are using stock data, you can also download it from sites like Yahoo Finance. If you are in doubt, you can always consult me.
3. **Technique:** The analysis should use relevant techniques to proceed with your investigation. You could use any of the techniques we have discussed in class or even other techniques. Explain your choice of methods clearly.
4. **Conclusions:** Draw your conclusions and explain them to the reader clearly.

Any write-up used for any of your other classes will not be accepted. There is no requirement on the number of pages, spacing, fonts etc.

Project idea 1:

Begin by selecting your favorite stocks or ETFs and create a portfolio that generates highest return for least variance using 1-year historic data. Now simulate forward the portfolio into the future using gbm, Merton, CEV and Heston. Adjust the portfolio weights that gives you best return over all the models. Now add suitable options to improve the sharpe ratio. Which models do you think are more pertaining for the future that is anticipated?

Project idea 2:

Take project 1 to the next level by requiring that interest rates be stochastic. Adjust the portfolio weights to get the best return across simulations of all models combined with Ho-Lee, CIR, Vasicek for interest rate dynamics. Which models do you think are more pertaining for the future that is anticipated?

Project idea 3:

Create an options strategy. Use historic data to support your options strategy. Then take the strategy forward and test its effectiveness using simulations from a range of suitable models: gbm, Merton, CEV, Heston, Ho-Lee, Vasicek, CIR. You may also use machine learning methods for predictions and base an options strategy on that. Explain your methodology clearly.

Project idea 4:

Volatility is a mean reverting measure. Formulate an options strategy using the mean reversion aspect of volatility. You may construct the volatility smile/surface for your favorite stock and apply mean reversion to the smile. Simulate option process into the future using Heston and test your strategy.

Project idea 5:

Formulate a trading strategy using non-standard exotics. You may use options/exotics to compliment stock trading strategies. For example, a pairs trading strategy could be enhanced or complemented using an exchange option strategy. Test your strategy using simulations into the future with relevant models.

Project idea 6:

Discuss with me if you want to investigate other directions.