**[15-112] Design Proposal part I: Project Proposal**

Lily Qiao

1. **Project Description:**

Algo Trading. This term project explores the methodology of reversion to mean (by implementing dynamic moving average) to predict stock prices.

***Update (TP2):***

*Instead of using dynamic MA as a means of predictions, I will use linear regression and monte carlo instead and use MA for back testing.*

1. **Competitive Analysis:**

There are many projects in regard to algorithmic trading, ranging from beginners using logistic regression models, to expert levels using techniques that require a PhD in statistics. Results also range from high performance to not predicting to the stock at all. Stocks are very volatile. Algo trading is, by no means, a short-term time investment. I’d like my project to act like a stepping stone, a start, a nudge that fuels a long-term trading investment.

My project will be like the simpler regression models online, but I will try to optimize my project and mess around with the parameters as I come close to finishing the TP. The difference between mine and those online is, instead of implementing a traditional MA, I’m proposing a *dynamic* moving average model that has many variable factors (range, window size, evaluation factors, etc.).

1. **Structural Plan:**

Starter screen, web scraping, actual prediction function(s), and back testing would be in different files for better visualization and implementation.

***Update (TP2):*** *different files:*

* *Main*
* *webScrape*
* *Userinterface (prev starter screen)*
* *RunRegression*
  + *LinearRegression object (prev actual prediction functions)*
    - *Fit (these are functions within the object)*
    - *Score*
    - *Predict*
  + *Cross\_val.sk*
  + *Lin\_reg.sk*
* *Monte Carlo (prev actual prediction functions)*
* *MovingAverages (prev back testing)*

1. **Timeline Plan:**

My project consists of 6 steps:

1. Research
   1. Web scraping
   2. Prediction (main part of the project)
   3. Back testing
   4. Optimization
   5. (Implementation (paper trading)) 🡨 big maybe

By TP1: (i) and setting up user interface. Start sketching outline/pseudocode for (ii)

By TP2: finish (ii), the core part of the project! Start planning out how to back test

By TP3: execute (iii), include graphs, optimize parameters, etc. Start paper trading online

***Update (TP2):***

1. *iv: No optimization. Scratch that, I optimize my model along the way.*
2. *Instead of adding graphs and optimize parameters for TP3, I’m doing it as I code now. TP3 will be changed to: piecing together all files/functions and start paper trading on Oanda.*
3. **Version Control Plan:**

I’m emailing the code to myself (constantly) as well as my TP mentor, and try to learn how to use Github. See below for picture of email draft (to mentor). Emails for sure.

***Update (TP2):***

*I am using Git, but still emailing myself from time to time just in case.*

1. **Module List:**

Pandas.

