Thinkful Final Capstone Proposal

I chose Time Series as my specialization. For the final Capstone project, I plan to use the knowledge I learned from Time Series to analyze the Stock Market with the Black-Scholes Model. In the Black-Scholes model, there are five variables. Volatility, stock price, risk free rate, exercise price, and time.

* Time is measured in years; from the moment you buy the option to a date that you can execute the option.
* Stock price will be determined by the stocks of current day.
* Exercise price will be set by the user (aka me).
* Volatility is the standard deviation
* Lastly**, *risk free rate*** is the most challenging to calculate.

We are mainly focusing on the ***risk free rate***, since other four variables are easily obtainable

Step 1: plot and analyze the stock indexes with Supervised and Unsupervised techniques – S&P500, DJIA, and NASDAQ.

*(The idea is to determine the general trend of the stock market for accurate predictions later)*

Step 2: use ARIMA model to predict stock market indexes to calculate the stock market return

Step 3: calculate inflation rate with Consumer Price Index

Step 4: input these variables into the Black-Scholes model to predict a future stock price

Step 5: use ARIMA model to predict the stock price as a comparison

Step 6: perform A/B test to determine which model to use for particular stocks

The solution will be valuable because being able to forecast the Stock Market Indexes, and then I will know when the right time to invest is. I plan to always come back to this model and improve it in the future. This project is also beneficial to me because it will teach me about finance. Before I want to pursue a career in the Data Science field, I wanted to work in the Banking Industry. I can see that these two fields are interconnected, and the project will be able to show their connectedness.

Data:

\* S&P 500: <http://quotes.wsj.com/index/SPX/historical-prices>

\* Dow Jones Industrial Average: <http://quotes.wsj.com/index/DJIA/historical-prices>

\* NASDAQ: <http://quotes.wsj.com/index/COMP/historical-prices>

\* CPI: <https://fred.stlouisfed.org/graph/?g=wic>