**Capstone 1 Proposal- Crytocurrency arbitrage trading algorithm**

**Intro**

We know cryptocurrency is one of the most volatile markets out there. Due to the instability, we hypothesized that using classical time series analysis (historical prices alone) isn’t the best way to predict a coin future price. Therefore, this project will use additional data such as correlation between the “cointegrated” coin and macroeconomic covariates to analyze the market, hoping that it will give us a better prediction of the future price. The project clients would be general investors who are interested in arbitrage trading of cryptocurrencies. Clients will be able to predict the rise/fall of a cointegrated cryptocurrency pair and, hypothetically, profit from trading the coins.

**Data set**

Financial data available on Cryptocompare.com will be used for this project (link below). Price history of the following currencies will be used to identify the “cointegrated” pair:

Bitcoin, Ethereum, Bitcoin Cash, Ripple, Litecoin, Nem, Dash, ZCash, Monero, IOTA, Ethereum Classic, Nxt, Stellar

In addition to the price history, this project will further explore additional features such as Google search counts of the word “cryptocurrency” (API link below), social media/news API’s, and Blockchain stats.

**Method (tentative)**

1. Identify macroeconomic covariates and obtain the data
2. Identify cointegrated cryptocurrency pairs based on Granger Causality Test
3. Analyze the pair price history using ARIMA model
4. Based on 1,2,3, come up with a ML that best predict future price/trading signal

**Deliverable (tentative)**

This project deliverable will be a report on the effectiveness of the ML model. In addition, there will be a slide deck that explains the advantages/limitations of our approach.

Links:

Google Trends API

https://github.com/GeneralMills/pytrends/blob/master/README.md#api-methods

Cryptocompare.com API

https://www.cryptocompare.com/api/#-api-data-histohour-