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CS478 Project Proposal: Stocks Deep Learning

Our team has decided that we will try to model the emotional state of the Nasdaq stock market in order to understand when the market is emotionally overbought or oversold. What we aim to do is to understand when we should expect some up or down movement in a particular security(equity/stock), so as to not be shocked when it does actually occur. At this point these are tentative goals; We have never done any work in Deep Learning and thus, have almost no idea of how big any one idea is. We will do our best to deliver a quality product/analysis by semester's end. Please bear with us and grade us on progress rather than perfection.

Market psychology paired with deep learning can give us greater insight into how and when we should make trades. This is interesting to our group as most of us have very little investing experience so if novices can figure out how to leverage deep learning effectively there are many more possibilities. Readings that our team will utilize to gain contextual understanding in order to tackle this project are: *Getting Started in Technical Analysis* by Jack Schwager, and *Technical Analysis* explained by Martin Pring. Both books give detail on technical analysis which can be used to make better predictions in stock price. A large portion of the data and formatting we will use can be found at:

https://www.kaggle.com/jacksoncrow/download-nasdaq-historical-data/notebook

We will try to get current data by either web scraping on stock websites where possible or trying a script that collects the data.

https://www.kaggle.com/datasets/jacksoncrow/stock-market-dataset/discussion/188637

If we cannot find a means to quickly collect new data then we will use existing data to build upon. We will use the Monte Carlo simulation method. There are existing implementations of this method which we can build off of and tweak. Most likely this will require adding different forms of data to include as context. We will evaluate our results by checking whether our model makes accurate predictions. Most likely, we will be utilizing cross validation as a performance metric. This will allow us to test our model under certain stressors, so that we can determine prediction accuracies. Essentially, by dividing data from our chosen subset into two segments, one segment is then used to train our model, while we use the other to compare it to. (Comparing independent vs dependent variable). We will need to learn technical analysis, which market psychology is an aspect of, to make our own predictions to compare against. Our results should

be representable as plots and we should be able to compare the accuracy of our predictions across sample sizes to tweak our activation function. Ultimately, the goal is that our market analysis model will help streamline investment and trading for newcomers and people unfamiliar with that environment, for users to maintain their focus on spreads and trends.