**Practicum 2 Proposal**

1. Name, Contact info

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1. Title of the project

Predicting daily stock market movement with machine learning

1. High level description of the project: what question or problem are you addressing?

Can the direction of a stock’s closing price be predicted before the market opens that day?

1. What type of data science task is it?

Analyzing historical stock data and using machine learning techniques to predict whether the daily return (opening price – closing price) on a stock is positive or negative

* Obtain data
* Clean & process data
* EDA & visualization
* ML model fitting and implementation
* Performance analysis with backtesting
* Implementation on live data

1. Data: Brief description of data. How big do you expect the data will be? Is amount of your data too big or too small? If you're web-scraping or collecting data, how long do you expect to collect the data?

* Historical data will be obtained with from yahoo finance API (yfinance)
* Live data will be obtained with ZeroMQ web socket

1. How will you analyze the data? What machine learning methods do you plan to use, and/or what business intelligence aspect do you plan on incorporating?

I plan to analyze historical simple moving average, momentum, and mean reversion strategies, then use machine learning to make the predictions:

* Classification
* Deep learning

1. Describe any anticipated difficulties and problems. Discuss how you may overcome the problems.

* Data consistency – switch data sources
* Overfitting data to ML models - regularization
* External factors – it’s not just the data that has implications on the market (COVID). If this is found it will be removed

1. Suggest a timeline for the project.  This should be a weekly breakdown of what you plan on doing each week.
   * **Week 1** – Finalize project details
   * **Week 2** – Obtain & prepare data
   * **Week 3** – EDA & Visualization
   * **Week 4, 5** – Testing of ML algorithms
   * **Week 6 –** Back testing & analysis
   * **Week 7 –** Revisit entire process & complete writeup, project summary
   * **Week 8** – Finalize Github repository, record presentation, submit project materials
2. Create GitHub repository for your Practicum project. Add this proposal, begin a ReadMe document, and begin adding your data to your repository. Add a link to your GitHub repository to this document.

<https://github.com/bgord623/Practicum-2>