Weekly Paper Summary (25 points total)

Paper Title	Machine Learning for Cryptocurrency Market Prediction and Trading
Authors	Patrick Jaquart, Sven Kopke, Christof Weinhardt
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1. **What do you think the paper is about in layman's terms? What did the research focus on, what did the authors find and what are the main conclusions (if any) [5 points]**

The research focused on applying various machine learning algorithms to develop models to predict whether a particular cryptocurrency would outperform the market or not. The research used a number of different algorithms, some of which were neural networks while others were common interpretable models. Ultimately, the authors' models had accuracies that ranged from 52-63% depending on the model used and the size of the portfolio used. While this may not seem very high, an accuracy even just slightly over 50% could mean a huge difference in profits when compared to choosing randomly if applied at a large scale. They also concluded that the recurrent neural networks, the temporal convolutional network, and tree-based ensembles performed the best of the models they studied.

2. **How would you extend the research paper – what new area(s) would you focus the paper on? [5 points]**

I would extend the research paper by applying the same methods to more cryptocurrencies. The authors made a good point that their use of the 100 most popular coins when the research started in 2016 helps avoid survivorship bias. However, they could've extended the research by applying their tactics to the 100 most popular coins in each of the subsequent years and started their sampling period then. This would've resulted in smaller samples for each subsequent year, but it would add volume and variety to the data in terms of how many total coins are studied across all start years.

3. **Discuss at least two real-world applications (not mentioned in the paper) that would benefit from the focus of / applications mentioned in the paper and why [15 points]**

One application of this research is using their moving average technique to allow for the comparison of models with memory and models without such in other applications. Since some of the models used here don't have memory, the authors used overlapping sequences of length 90 that are iteratively shifted forward by one day as the input data for the models to predict whether the coin in question outperformed the market the next day. This could have application in any discipline where some models with memory are studied and some models without memory are studied and the user wishes to compare their accuracy, one example being predicting the weather, as the weather one day is very well associated with the weather of the previous few days. Another real world application is predicting whether common stocks or other financial assets outperform the market using these same tactics. Stocks will have similar daily price data available and are much more popular and less volatile than cryptocurrency. The performance of other stocks in the same sector could also be considered when predicting the performance of a stock relative to the market because those are closely tied together, which could mean even more accurate predictive models. There are also far more than 100 stocks that could be predicted which would allow for more volume and possibly more variety of the data available when compared to cryptocurrency.