# Time Series Forecasting of Cardano (ADA)
# In the Cryptocurrency Market

## Springboard Data Science Capstone Project 3

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**Times Series Forecasting for Cardano (ADA)**

Critical to any investing venture is the forecasted predictions for whatever asset the client is interested in. Cryptocurrency as a whole has seen an influx of interest across the broader public spectrum, expanding its initial network blockchain from Bitcoin to Ethereum and the possibilities have multiplied exponentially since then. While Ethereum and Binance have the corner of the market in terms of exchanges and blockchains that allow the buying and selling of cryptocurrencies en masse, the need for enhanced transactions speeds, reduced gas fees on transactions, and a greener energy consumption outlook for miner's of said cryptocurrency has created a competitive marketplace with multiple blockchain assets vying for relevance. Cardano is one such blockchain, seeking to allow transactions at a millionth the speed of the current average Ethereum transaction, at a fraction of the cost, with renewable energy sources at the forefront of its mission when considering it is a proof of stake asset compared to a proof of work. "Proof of Work (POW) requires huge amounts of energy, with miners needing to sell their coins to ultimately foot the bill; Proof of Stake (PoS) gives mining power based on the percentage of coins held by a miner."[1] Cardano finds itself attempting to create an exchange that will solve the aforementioned problems, launching itself to the forefront of cryptocurrency exchanges, as the platform to create, buy, sell, and store goods and assets within the digital currency world.

I have located CSV files for 23 different cryptocurrencies ranging from Bitcoin and Ethereum to Cardano and Polkadot. For each coin there is a CSV file that contains data split into the columns: Date, Open, High, Low, Close, Volume, Market Cap, etc.

[1] Frankenfield, Jake. 'Proof of Stake'. *Investopedia.* April, 21 2021. https://www.investopedia.com/terms/p/proof-stake-pos.asp#:~:text=Proof%20of%20Work%20(POW)%20requires,coins%20held%20by%20a%20miner.

Each CSV file contains daily trading data dating back to at least October of 2017, until April of 2021. I will model the predictive task at hand as a supervised learning problem, with the intent being to utilize several one-step univariate forecasting methods of training the predicted output based on the daily average value for the coin. I will also utilize sequencing or multi-feature forecasting in order to incorporate more variables from the data set and achieve a more robust prediction.[2]

All algorithms will be compared and contrasted with respect to appropriate performance metrics. Finally, I will explore the possibility of extracting information about the interaction between the features and the target, through the models that will be implemented.

A GitHub repository will house the findings from Data Wrangling and Exploratory Data Analysis, as well as the Baseline Modeling and Advanced Modeling portions of this capstone project. All the results will be documented in a final report, as well as in a presentation slide deck.

[2] Brownlee, Jason. 'How to Convert a Time Series into a Supervised learning problem in Python.' *Machine learning Mastery.*
https://machinelearningmastery.com/convert-time-series-supervised-learning-problem-python/