# 1.2P: Project in your own words

# Financial time series analysis with machine learning

Financial time series is used to analyse and predict the outcomes of a financial asset or investments. The value of any financial asset is extremely volatile and can be changed with the external factors such as wars, disasters, economy, et cetera. Thus, a good prediction model for the accuracy is required. This project will focus on creating a machine learning model, which in turn will be used to discover the patterns in the data of the financial asset and then predict for the next six months and the how much returns one could enjoy from the portfolio.

Financial time series is different form other time series, because of the addition of uncertainty, statistical theory as well as methods used. There are hundreds, maybe thousands of machine learning and deep learning algorithms, which can be used for prediction, like Auto regressive moving average (ARMA), regression models with time series errors, Autoregressive conditional heteroskedasticity (ARCH), et cetera.

Different types of models can work with different types of datasets, like LSTM works better with huge amount of dataset, but ARIMA will work better with smaller dataset. Different machine learning models will have different shortcomings, for example in the DCF method, the model is not reliable as it will predict the future occurrences will reoccur on the basis of past occurrences, but still it is widely used by fund managers of different companies.

For the project, I will be analysing the data for Nifty-50, which is benchmark for Indian stock market and represents the average of 50 of the largest Indian companies. The data consists of 50 different companies, enlisted on National Stock Exchange of India, from 1st of January,2000 to 30th of April,2021. All the datasets are at day-level with pricing and trading values split across.

The project will be aimed to study the most commonly used Machine learning algorithms, then choose two of the models, one of which would be aimed to get the result as accurately as possible and the second model, where the investor could take more risk, but more returns are received. Another model could be made out by combining the two algorithms, where the risk is least and returns are more.