Proposal Template
PCL 105

Title: **Stock price prediction using Moving Average and Auto-Regressive Time Series Model**

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Abstract:

Stock price prediction is an important aspect of Financial Engineering. Businesses and economies around the world depend on accurate forecasting of stocks of different kinds. However, prices of stocks and shares depend on a variety of seemingly unrelated factors and may be influenced by random events, rare events, seasonal and periodic trends, shocks, etc. This makes prediction of stock prices and shares a difficult task. This presents lucrative monetary payoffs for designing models that make accurate forecasting. We propose two models for stock price prediction, viz. moving average and auto-regressive models and test these models against real data.

Description of data:

We will primarily use data from the database of stocks and shares maintained by the International Forum for Economic and Business Activities (IFEBA). The database is available at www.yankeedoodle.com/database. This database contains records of all stock exchanges of major economies from the past 50 years. The data is arranged into three columns containing the name of the listed company, share price and month/year.

Statistical Model:

We propose to implement a MA(p) and an AR(q) model to the data. We will use the partial autocorrelation function as a diagnostic to chose the order p and q of our models. We will also discuss other techniques to estimate the order of the models, namely: the *matter of factor* method and the *Bhangra-Pale* method. A detailed comparison of all these above mentioned methods will be presented in the form of a table and the most suitable approach will be employed.

Deliverables and Ouput:

The MA(p) and AR(q) models will be used for forecasting of future stock prices. In order to test the efficacy of each of these two methods, a test database will be used. The test database is not taken from the database that is used to estimate the parameters of the time series models and is independent of the model construction procedure. The results of the MA(p) and AR(q) forecasting models will be presented in terms of an error function defined based on the Humpty-Dumpty distance metric. We will conclude with a commentary on the suitability of different time series models for different types of datasets.