Abstract

In the financial sector, the dependence on modern technologies has seen an increase since the last two decades. The advancements in the field of neural networks and machine learning has provided a number of financial tools. These tools often seen to form the basis of financial computations such as stock market prediction, bankruptcy prediction, risk assessment etc. In this paper, we propose a model based on an adaptive NARX neural network to predict the closing price of any stock. This is a non-linear auto regressive exogenous input model which uses delays in the input as well as the output acting as memory slots thereby increasing the accuracy of the prediction. This model uses a time series approach to analyze and predict the closing price. This NARX model is trained using three input values - the opening price of the stock, the highest price of the stock and the lowest price of the stock for the day. The target values are also fed to the network as it is a supervised learning model. Levenberg-marquardt algorithm has been used for training the network. The accuracy of the network is determined with the help of the mean squared error. In this model, we have made use of a closed loop with reduced input delays as well as a closed loop model for making predictions and the accuracy of
each case is determined to analyze the working of a NARX neural network and to determine the optimum configuration.

**References**

1. Abhishek Kar (Y8021), Department of Computer Science and Engineering, IIT Kanpur, “Stock Prediction using Artificial Neural Networks”.
3. Marijana Zekic, University of Josip Juraj Strossmayer in Osijek, “Neural Network Applications in Stock Market Predictions – A Methodology Analysis”.
6. Images from google, matlab.org.

**Index Terms**

Computer Science Networks
Keywords

Neural Networks, NARX (Non-Linear Auto Regressive Exogenous inputs model), Training data, Target data, delays, mean - squared error.