

DECISION SUPPORTING SYSTEM FOR STOCK MARKET PRICE PREDICTION

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ABSTRACT

The share market is dynamic in nature meaning to predict share value is incredibly advanced method by general prediction or computation methodology. Its main reason is that there is no linear relationship between the market parameters and target price, thus use of Neural Network may be a alternative of interest for share market prediction. Apart from Neural Network the projected system consists of 3 additional algorithms: Regression, statement and Moving average. mistreatment these algorithms, the fundamental plan behind this method is to predict the longer term share values primarily based of the past values. Also, use of those algorithms leads the system to lead to higher output yet as increases the potency.

Keyword : - Sensex , Past data., Share, Closing price, BSE.

1. INTRODUCTION

Artificial Neural Network plays vital role in statistic analysis and prediction. Share market prediction is one among sophisticated downside as a result of it's dynamic in nature i.e. sensex worth is systematically dynamic. Hence it's terribly difficult to spot the patterns and predict the share worth. Existing system are not well economical attributable to dynamic nature of share market. During this paper we have a tendency to are trying to boost accuracy of share market prediction victimization four completely different algorithms as Neural network, Regression, prediction and Moving Average. Using this four algorithms we'll try and improve accuracy of existing system from 20%-30% to 50%-60%. This may facilitate share broker and client to purchase or sell the share and to speculate cash.

2. LITERATURE SURVEY

Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work Introduction related your research work

2.1 Artificial Neural Networks for Forecasting Stock Price (2008)

According to This paper the target is to be able to develop a protracted term rating relationship between stocks and profit. applied math arbitrage ways have always been well-liked since the appearance of algorithmic commerce. above all, Exchange listed fund (E.T.F.) arbitrage has attracted abundant attention. Trading houses have tried to copy ETF arbitrage to alternative stocks. Thus, the target is to be able to develop a protracted term rating relationship between stocks and profit from their divergence from this relationship. during this paper, we've got developed a feasible commerce strategy on this idea. Artificial neural networks are deployed to model the rating relationship between components in an exceedingly sector. All prices are thought of at identical instant, thereby permitting United States of America to form trading choices in accordance with our predictions. supervised learning algorithms are wont to train the network.

2.2 Stock Market Prediction Using Artificial Neural Networks (2012)

According to this paper the authors, the aim of this project is implementation of neural networks with back propagation algorithmic program for stock exchange. Borrowing from biology, researchers area unit exploring neural networks - a brand new, non algorithmic approach to IP. A neural network could be a powerful datamodeling tool that's able to capture and represent complicated input/output relationships. The motivation for the event of neural network technology stemmed from the will to develop a synthetic system that would perform "intelligent" tasks the same as those performed by the human brain.

2.3 Performance Analysis of Indian Stock Market Index using Neural Network Time Series Model (2013)

According to this paper, A statistic may be a assortment of observations created chronologically. the character of your time series knowledge includes: giant in knowledge size, high dimensionality and necessary to update unendingly. statement supported time series knowledge for stock costs, currency rate of exchange, worth indices, etc., is one of the active analysis areas in several field viz., finance, arithmetic, physics, machine learning, etc. Initially, the matter of monetary time sequences analysis and prediction ar resolved by several applied mathematics models. throughout the past few decades, an oversized range of neural network models are planned to unravel the problem of monetary knowledge and to get correct prediction result. The statistical model integrated with ANN (Hybrid model) has given higher result than victimization single model. This work discusses some basic ideas of your time series data, would like of ANN, importance of stock indices, survey of the previous works and it investigates neural network models for statistic in statement.

2.4 Forecasting of Indian stock market using time-series ARIMA Model(2014)

According to this paper associate application of ARIMA model supported that we have a tendency to predict the longer term stock indices that have a robust influence on the performance of the Indian economy. The Indian securities market is that the centre of interest for several economists, investors and researchers and therefore it's quite necessary for them to have a transparent understanding of the current standing of the market. to determine the model author applied the validation technique with the ascertained knowledge of sensex of 2013.

3. EXISTING SYSTEM

Stock market prediction is Associate in Nursing act to see future stock worth (share price). This prediction takes place by taking the past share values in to thought. For this the present system makes use of algorithms like ANN (Artificial Neural Network), ARIMA model, statistic prediction etc. potency of those algorithms is a smaller amount as compare to the projected system formula. there's no such a system that makes use of 4 algorithms in one system. thence that leads the existing systems to be less economical.

4. PROPOSED SYSTEM

We use artificial neural network ways like prognostication, regression, and Moving averages. In prognostication technique the system is taking the 3 days last and therefore the current year stock portfolio terms from the anticipated date and performs calculations on that for predicting the stock portfolio worth. Moving averages technique, system is take the 10 days stock portfolio terms type the predicting date and calculate the stock worth.

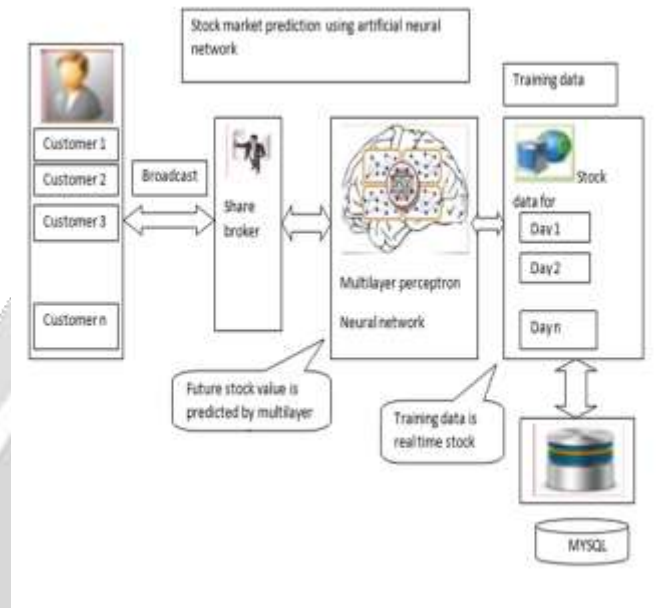


Fig -1: System Architecture

In this technique a alpha is ready for the predicting worth it's a continuing for this method. Regression technique, it's a applied math assessing the association between two variables. it's accustomed notice relationship between 2 variables. Neural networks technique has effective, general purpose approach for pattern recognition, classification, and agglomeration and particularly statistic prediction with a good degree of accuracy. all the same, their performance isn't invariably satisfactory. Back propagation formula is that the best formula to be employed in Feed forward neural network as a result of it reduces a slip between the particular output and desired output in a very gradient descent manner.

5. ALGORITHMS

5.1 Moving Average Algorithm

Get the last n records stock value from predicted date

1. Calculate Value for add

$add = actualValues[0] + (5 * (actualValues[0] / 100));$

2. Calculate Pre-Assume value

$preassume = actualValues[0] + add$

3. Set static value alpha

$alpha = 0.7$

4. Set one fix predicted value

$predictedvalues[0] = preassume + (alpha * (actualValues[0] - preassume));$

6. Apply the formula for Prediction

$predictedvalues[i+1] = predictedvalues[i] + (alpha * (actualValues[i+1] - predictedvalues[i]));$

5.2 Regression Algorithm

1. Take a past few close values from any company. That is y_i and take constant I values that is x_i
2. Calculate the slope i.e. $b = \frac{\sum [(x_i - \bar{x})(y_i - \bar{y})]}{\sum [(x_i - \bar{x})^2]}$
3. Calculate intercept i.e. $a = \bar{y} - b * \bar{x}$
4. Now calculate $(Y) = a + bX$ and here we got value of dependent variable.
5. Calculate the coefficient of determination. That is $R^2 = \frac{\sum [(x_i - \bar{x}) * I(y_i - \bar{y})]}{(\sigma * \sigma)}$
6. For calculating coefficient of determination we need σ_x, σ_y
7. So firstly calculate $\sigma_x = \sqrt{\frac{\sum (x_i - \bar{x})^2}{N}}$ then $\sigma_y = \sqrt{\frac{\sum (y_i - \bar{y})^2}{N}}$
8. Coefficient of determination gives us variation of dependant variable and relation among the dependant variable and independent variable.

5.3 Forecasting Algorithm

1. Forecast calculation
Take the last & current year stock price.
Eg. Last year = L1,L2,L3..
Current year = C1,C2,C3..
2. Calculate summation of stock prices.
 $Sum1 = L1 + L2 + L3$
 $Sum2 = C1 + C2 + C3$
3. Calculate pf.
 $pf = (Sum1 / Sum2)$
4. Calculate sn using formula 1.
 $sn = n1 + n2 + n3$
Here $n1, n2, n3$ are stock values of current year multiplied by pf.
5. Finally calculate Percent Of Accuracy
 $POA = sn / pn * 100$ where pn is summation of current year stock value.
6. If $POA > 105$ then add alpha value Else subtract alpha value.
Where alpha value = 0.7

5.4 Neural Network Algorithm

1. Get the stock data training set
2. Calculate the Linear Regression factor on stock closing value
 $lrFactor = (rFactor / y.length) * 100.0D$
 $rFactor = rFactor + Math.abs(diff / y[j])$, Here, $y[j]$ is the stock close values set
 $diff = y[j] - (aX + bX * x[j])$
 $bX = sum1 / sum2$
 $aX = ym - bX * xm$
3. Then subtract the Linear Regression from set
 $ytmp = lr.subtractLinearRegression(null, ytmp)$, Here, $ytmp$ is the copy of original set
4. Apply the fourier analysis on the set
 $interval1 = fa.transform(ytmp);$
5. After processing on data, normalize the data by dividing by constant value
6. Creates new Multi LayerPerceptron with specified number of neurons in Layers
`MultiLayerPerceptron(TransferFunctionType transferFunctionType, int..neuronsInLayers)`
7. Provides implementations of specific neural network learning algorithm
`MomentumBackpropagation learningRule = ((MomentumBackpropagation) neuralNet.getLearningRule())`
8. Set learning algorithm for this network
`public void setLearningRule(LearningRule)`
9. Performs calculation on whole network
`public void calculate()`
10. Returns network output vector
`public double[] getOutput(), Output vector is an array collection of Double values`

6. ADVANTAGES

- Dynamic in nature.
- High Accuracy.
- Noise Tolerance.
- List Item - 4
- Share broker will increase his/her and customer's profit by predicting stock value.

7. DISADVANTAGES

- Downside in change of knowledge.
- Previous systems cannot predict the share market values expeditiously.

6. REFERENCES

- [1]. Wenping Zhang, Chunping Li, Yunming Ye, Wenjie Li and Eric W.T. Ngai, "Dynamic Business Network Analysis for Correlated Stock Price Movement Prediction.", 1541- 1672/15/31.00 © 2015 IEEE.
- [2]. Debadrita Banerjee, " Forecasting of Indian Stock Market using Time-series ARIMA Model", 2014 2nd International Conference on Business and Information Management (ICBIM).
- [3]. D. Ashok kumar, S. Murugan, " Performance Analysis of Indian Stock Market Index using Neural Network Time Series Model", Proceedings of the 2013 International Conference on Pattern Recognition, Informatics and Mobile Engineering (PRIME) February 21-22.
- [4]. Prakash Ramani, Dr.P.D.Murarka, "Stock market Prediction Using Artificial Neural Network", International Journal of Advanced Research in Computer Science and Software Engineering, volume 3 issue 4, April 2013.
- [5]. Neelama Budhani, Dr.C.K.Jha, Sandeep K. Budhani "Stock market prediction using artificial neural network ", International Journal Of Computer science And Engineering Technology, volume 3 no.4 April 2012.
- [6]. K. K. Sureshkumar, Dr. N. M. Elango, Performance analysis of Stock price prediction using Artificial neural Networks, Global journal of computer science and Technology, volume 2 issue 1 version 1.0 January 2012.
- [7]. Zahir Haider khan, Tasnim Sharmin Alin md. Akter Hussain, price prediction of share market using Artificial Neural Network(ANN), International Journal of computer application(09758887) volume 22 no.2, May 2011.
- [8]. K. K. Sureshkumar, Dr. N. M. Elango ,An Efficient Approach to forecast Indian Stock Market Price and their Performance analysis, International journal of computer application (09758887) volume 34, no 5, November 2011.
- [9]. Zhou Yixin Jie Zhang, Stock data analysis based on BP neural network, 2010 second international conference on communication Software an Network.
- [10]. Ramnik Arora (Y5365), "artificial neural networks for forecasting stock price ", Submitted to : Dr. S.K. Mathur Course : Eco 311, 2008.