

COMPUTATIONAL PREDICTION MODEL FOR STOCK MARKET

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Abstract- Stock market prediction has been an imperative issue in the field of finance, engineering and mathematics because of its potential monetary benefit. As a huge measure of capital is exchanged through the share trading system, money markets is viewed as a pinnacle speculation outlet. Furthermore, securities exchange expectation carries with it the test of demonstrating whether the money related market is unsurprising or not. This paper reviews machine learning system for stock market prediction. The prediction of stock market is viewed as a testing undertaking of money related time arrangement forecast. Because of the multifaceted nature of securities exchange information, advancement of effective model for anticipating is exceptionally troublesome. The models depend on Regression analysis like Linear Regression, Generalized linear regression with different parameters. In expansion, for exact securities exchange forecast, we examine different worldwide occasions and their issues on anticipating stock exchanges.

Keywords – Stock market, Machine learning, Linear Regression, Generalized Linear Regression.

1. INTRODUCTION

Forecasting stock value file and its development has been regarded as a standout among the most difficult utilization of time arrangement forecast. Despite the fact that there have been numerous exact re-seeks which manage the issues of forecasting stock value record, most experimental discoveries are related with the created financial markets. Be that as it may, few investigates exist in the writing to predict the heading of stock value record development in developing markets, particularly in Turkish securities exchange [1]. Exact expectations of development of stock cost lists are essential for developing powerful market exchanging systems. In this manner, financial specialists can enclose against potential market risks and specialists have opportunities to make profit by exchanging stock index.

Securities exchange expectation is viewed as a testing errand of the money related time arrangement forecast process since the stock exchange is basically unique, nonlinear, muddled, non-parametric, and riotous in nature [1]. Furthermore, securities exchange is influenced by numerous large scale prudent factors, for example, political occasions, firms strategies, general monetary conditions, financial specialists' desires, institutional speculators' decisions, development of other stock exchange, and brain research of speculators and so forth.

Linear Regression and Generalized linear regression are used in the prediction of percent change price in the stock market over the few weeks. Work carried out also compares the accuracy and the ability of the models to predict near correct value of the future projections of the stock market.

It is vital to consider the level of stock esteem list development consistency using data from creating markets, for instance, that of Turkey [1]. Since its establishment in December 1985, the Istanbul Stock Exchange (ISE) has introduced an extraordinary development as a developing business sector. The ISE is depicted with high insecurity in the market returns. The ISE is depicted with high precariousness in the market returns. Such unsteadiness pulls in various neighborhood and outside monetary masters as it gives excellent yield believability. The amount of associations recorded in the ISE extended to 343 out of 2010 while it was 80 of each 1986. Indicated trading volume came to \$ 316.326 billion and total market capitalization was \$ 235.996 billion out of 2009 (<http://www.ise.org>). The ISE National 100 Index, which is the standard grandstand pointer of the ISE, is a market capitalization-weighted record and addresses no under 75% of the total market capitalization, traded regard, number of offers traded and number of trades recognized in the market. The central focus of this paper is to predict the course of improvement in the step by step ISE National 100 Index using Linear Regression and Generalized linear regression. The huge duties of this examination are to appear and affirm the consistency of stock esteem record heading using Regression and GLR are to consider the execution of these systems [1].

2. METHODS USED

A. Linear Regression:

Linear regression is a simple and easy method to find the relation between two set of variables. Most of the graphs in scientific data or statistical analysis compare the relation between a variable X and Y. The main intention is to compare the difference

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between the two independent variable to derive a conclusion. Statistical analysis on these data could be a Hypothetical testing to find the association between two variables, to find the degree of association between the two variables and to determine the equation of a line that goes through the scattered points [2].

$$Y = \beta_1 + \beta_2 X \text{ or } Y = a + bX$$

First, the parameters a and b of the regression line are found out from the values of the dependent variable Y and the independent variable X using statistical methods. This enables the prediction of the value of the dependent variable Y from that of the independent variable X . The slope b of the regression line is called the regression coefficient. It provides a measure of the contribution of the independent variable X toward explaining the dependent variable Y . If the independent variable is continuous, then the regression coefficient represents the change in the dependent variable per unit of change in the independent variable. Therefore here we use linear regression data to find the relationship between the Stock-market data to predict the stock market price [3].

In Business, this dependent variable can also be called the predictor or the factor of interest, in our case percentage change in price. Linear Regression is a very powerful statistical technique and can be used to generate insights on consumer behavior, understanding business and factors influencing profitability. Linear regression can also be used to analyze the marketing effectiveness, pricing and promotions on sales of a product. Assess risk in financial services or insurance domain, credit card industry for risk assessment [4].

B. Generalized Linear Model

In statistical analysis, the generalized linear model (GLM) is an adaptable generalization of simple linear regression that have error distribution model. The GLM generalize up linear regression by enabling the linear model to be identified with the response variable through a connection work and by permitting the size of the fluctuation of every estimation to be an element of its predicted value. [5].

Generalized linear models give a unified approach to the performance of regression analysis of dichotomous, count or continuous data [6].

In generalized linear model (GLM), every result Y of the dependent variable is thought to be produced from a specific conveyance in the exponential family, incorporates the normal, binomial, Poisson and gamma distributions, among others. It is advantageous if V takes after from the exponential family distribution, however it might just be that the difference is a function of the predicted value. The unknown parameters, β , are normally evaluated with maximum probability, greatest quasi-likelihood, or Bayesian methods [5].

3. RESULT

Linear Regression :

Absolute Error: 1.524 +/- 1.056

Generalized Linear Regression:

Root mean square error : 2.415 +/- 0.000

The comparison between the two different models used to carried out are given below in the graphical representation. The outcome of the comaprison showed that Simple linear regression produced result with better accuracy. The dataset consisted of the data of high, low, average and close rates of the current week and the previous week was tabulated. The percentage of change in price was the main prediction that was carried out and hence marked as labeled.

The comparative analysis shows Linear Regression to be the best forecasting method with least deviation.

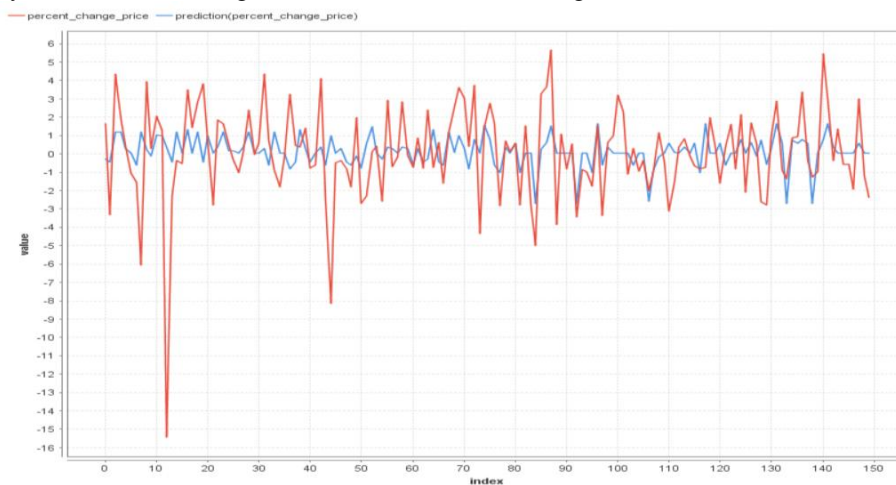


Figure 1: Shows the regression analysis graph of Generalized Linear Regression model on the given dataset for the prediction of percentage change in price. Here the Red series representation shows the actual data and the blue indicates the Predicted data

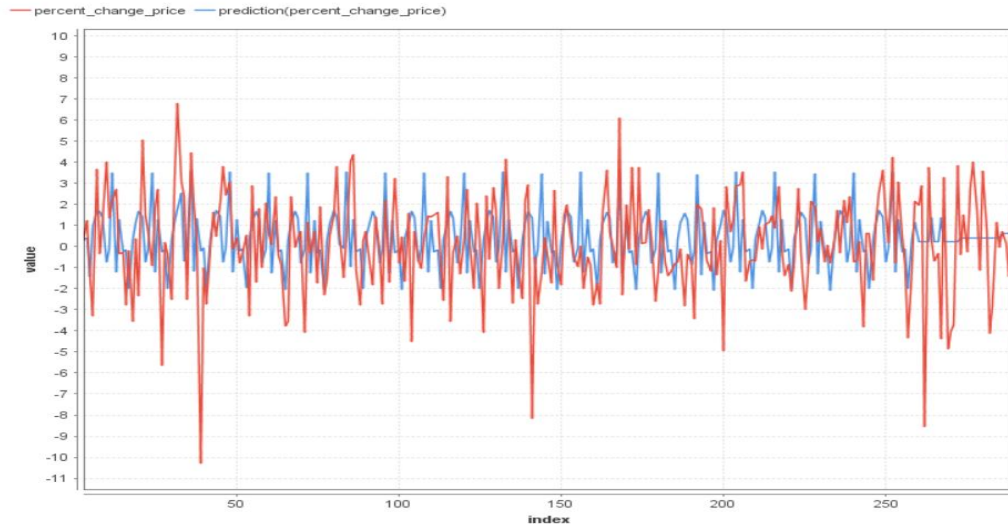


Figure 2: Shows the regression analysis graph of Linear Regression model on the given dataset for the prediction of percentage change in price. Here the Red series representation shows the actual data and the blue indicates the Predicted data

4. CONCLUSION

Stock market prediction has been an imperative issue in the field of finance, engineering and mathematics because of its potential monetary benefit. As a huge measure of capital is exchanged through the share trading system, money markets is viewed as a pinnacle speculation outlet. Furthermore, securities exchange expectation carries with it the test of demonstrating whether the money related market is unsurprising or not. The prediction of stock market is viewed as a testing undertaking of money related time arrangement forecast. Because of the multifaceted nature of securities exchange information, advancement of effective model for anticipating is exceptionally troublesome. In expansion, for exact securities exchange forecast, we examine different worldwide occasions and their issues on anticipating stock exchanges. To the best learning of the creators, the expectation performance of the proposed models beats comparative examinations in the writing. Nevertheless, prediction performance of our models might be enhanced with further analysis with new models and regression methods. This can be a future work for inquisitive readers.

5. REFERENCES

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