Future Prediction of Stock Prices

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Introduction

Stock Markets!

Used neural networks

 - because can learn nonlinear mappings between inputs and outputs.

Dataset Used

Our data includes Microsoft's last 10 years' closing value (daily basis) in USD as on NASDAQ.

Microsoft was chosen because there was very less change in its stock value price in terms of monetary difference (15-37) over the period of 10 years

Nearest Neighborhood

- Initiating training inputs:
  - Defining a starting training period divided on vectors $_t x^m$ of size m, t=m,…,T where

    T : number of observations on training period

    m : embedding dimensions

- Finding k nearest neighbors(pieces) of $_T x^m$:

  - k values with highest correlation $|\rho|$ between $_t x^m$ and $_T x^m$

- Constructing the forecast for t+1:
  - The method chosen is

$$\hat{x}_{T+1} = \hat{\alpha}_0 x_T + \hat{\alpha}_1 x_{T-1} + ... + \hat{\alpha}_{m-1} x_{T-m+1} + \hat{\alpha}_m$$

Continued

The coefficients are the values of αi that minimise

$$\sum_{r=1}^{k} (x_{i_r+1} - \alpha_0 x_{i_r} - \alpha_1 x_{i_r-1} - \ldots - \alpha_{m-1} x_{i_r-m+1} - \alpha_m)^2$$

We have trained the network for 95 % of the data and then tested it for rest 5 % of our data.

Neural Networks

- Is an interconnected group of natural or artificial neurons that uses a mathematical or computational model for information processing based on a connectionistic approach to computation

- The utility of artificial neural network models lies in the fact that they can be used to infer a function from observations and also to use it

Input Layer

Output Layer

Implementation

Forecasts VS Real values (m=3 , k=20 d=1000)
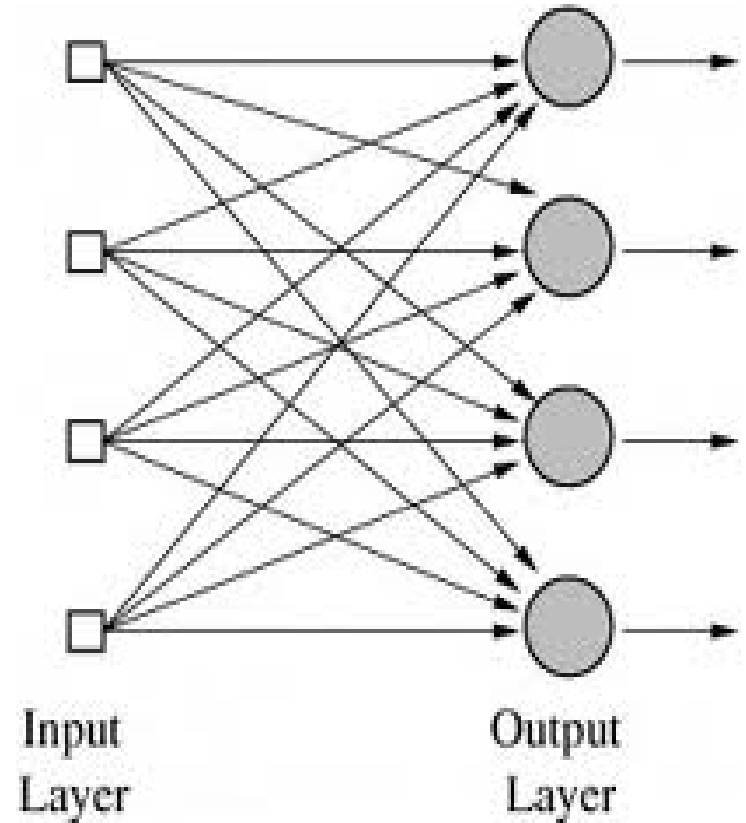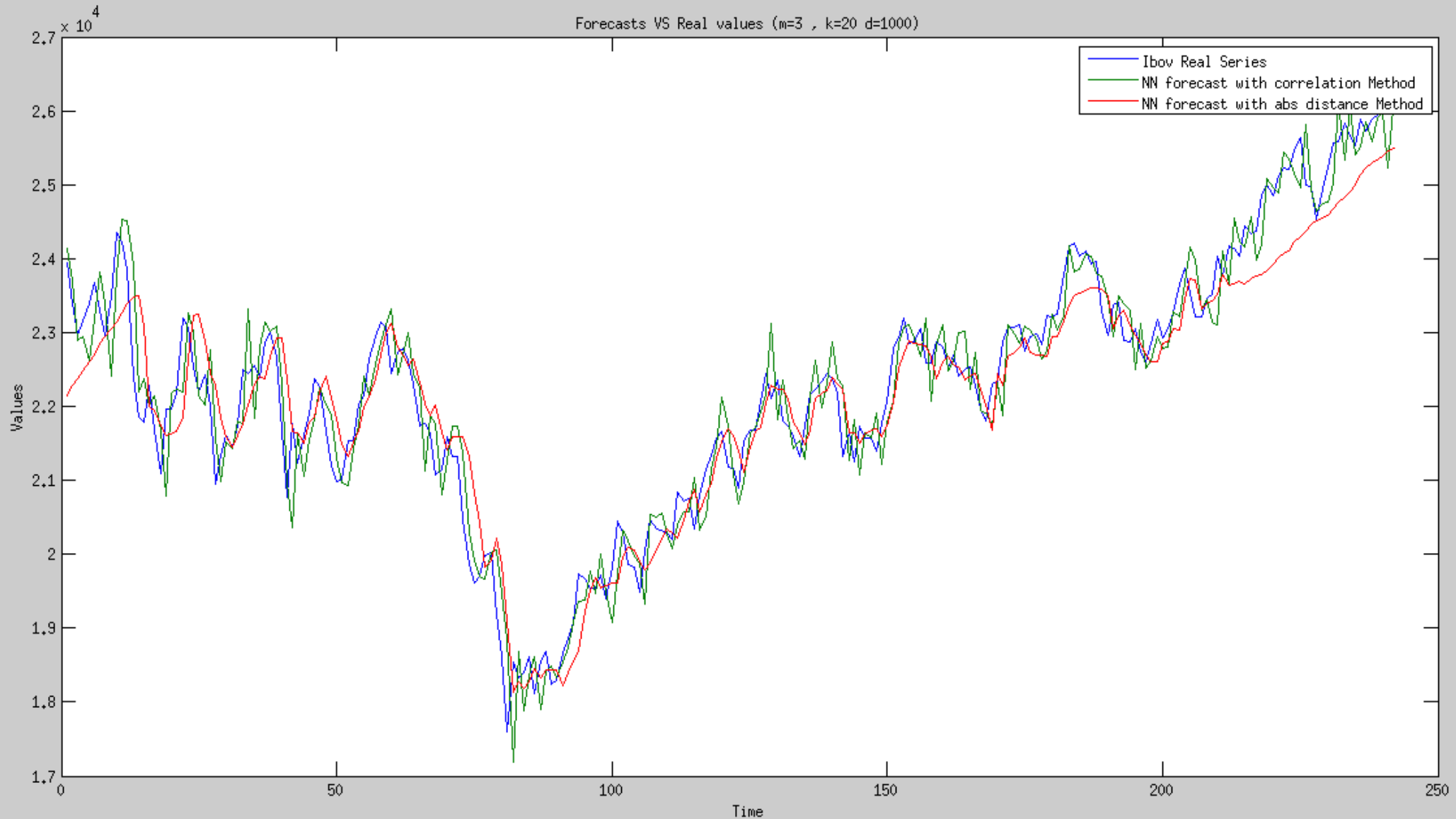
Conclusion

- It is better than other methods as it is time invariant

  - The values which are used for prediction doesnt actually depend on time

- It tries to predict values by learning what happened when similar values came in past (irrespective of time)

- Include more factors for better result:

  - Attitudes of investors in response to different forces.

  - Depth analysis of a company's performance and profitability.

  - Overall economic conditions.

  - Company's competition.

  - Volume.

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Thank You!