Stock Investment Data Analysis

A **stock market**, **equity market**, or **share market** is the aggregation of buyers and sellers of stocks (also called shares), which represent ownership claims on businesses; these may include *securities* listed on a public stock exchange, as well as stock that is only traded privately, such as shares of private companies which are sold to investors through equity crowdfunding platforms. Investment in the stock market is most often done via stockbrokerages and electronic trading platforms. Investment is usually made with an investment strategy in mind.

LSTM to build the model in order to predict stock price

LSTM are a various of the RNN architecture. With these memory cells, network can effectively associate memories and input remote in time, hence, suite to graps the structure of data dynamically over time with high prediction.

Data Preprocessing

The preprocessing stage involves Data dicretization, Data transformation, Data Cleaning, Data integration. After the dataset is transformed, the dataset is divided into training and testing sets to evaluate

Feature Extraction

In this layer, only the features which are to be fed to the neural network are chosen.

Training Neural Network

In this stage, the data is fed to the neural network and trained for prediction assigning random biaises and weights.

The stochastic gradient descent update for **ADAgrad** is given by $\theta_{t+1,i} = \theta_{t,i} - \mu g_{t,i}$

Where $g_{t,i} = \nabla_{\theta t} J(\theta_{t,i})$

So, the learning rate becomes $\theta_{t+1} = \theta_t - \frac{\mu}{\sqrt{G_t + \epsilon}} . g_t$

Optimizer

The type of optimizer used can greatly affect how fast the algorithm converges to the minimum value. Her we have chosen to use **Adam** optmizer. The Adam optimizer combines the perks of two other optimizers : **ADAgrad** and **RMSprop**.

Adam(Adaptative Movement Estimation) is another method that computes the adapative learning rates for each parameter based on its past gradients.

$v_t = \beta_{v_{t-1}} + (1 - \beta) t g^2$

Dropouts

Dropouts are used in making the neurons more robust and hence allowing them to predict the trend without focusing on any one neuron.