Mini-Project 4: Stock price prediction using neural network, lstm and cnn

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Prepared by: Chandini Nagendra

Siddharth Chittora

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# Problem Statement

Task 1: Use the daily [Open, High, Low, Volume] to predict [Close] on that day using **a fully-connected neural network**. Use the first 70% of the records for training and the remaining 30% of the records for test. Report the RMSE of the model. Show the “regression lift chart” of your test data.

• Task 2: Predict [Close] of a day based on the last 7 days’ data [Open, High, Low, Volume, Close] using a **LSTM model**. In other words, we want to predict the price in the green cell using all the numbers in the red cell. Use the first 70% of the available records for training and the remaining 30% of the available records for test. Report the RMSE of the model. Show the “regression lift chart” of your test data.

Hint: Each record in X can be viewed as a sequence of 7 vectors, each vector with 5 dimensions.

• Task 3: Do the same as Task 2 but use a **CNN model**. Report the RMSE of the model. Show the “regression lift chart” of your test data.

Hint: The red cell can be considered as an image that has 7 pixels, each pixel with 5 channels.

# Methodology

# Experimental Results and Analysis

|  |  |  |
| --- | --- | --- |
| **Model & Tuning** | **RMSE** | **R2 Score** |
| Linear Regression | 0.56 | 0.70 |
| Logistic Regression | 1.38 | 0.54 |
| **Tensor flow regression neural network models** |  |  |
| ReLU without stopping & checkpoint | 0.59 | 0.64 |
| ReLU with stopping & checkpoint + adam | 0.52 | 0.72 |
| ReLU with stopping & checkpoint + sgd | 0.49 | 0.74 |
| ReLU with stopping & checkpoint + RMSprop | 0.51 | 0.73 |
| ReLU with stopping & checkpoint + Adagrad | 0.51 | 0.73 |
| ReLU with stopping & checkpoint + Adadelta | 0.50 | 0.74 |
| ReLU with stopping & checkpoint + Adamax | 0.50 | 0.74 |
| ReLU with stopping & checkpoint + Nadam | 0.52 | 0.72 |
| ReLU with stopping & checkpoint + Adamax + 2 hidden layers | 0.52 | 0.72 |
| ReLU with stopping & checkpoint + Adamax + 3 hidden layers | 0.51 | 0.72 |
| ReLU with stopping & checkpoint + Adamax + 4 hidden layers | 0.51 | 0.73 |
| ReLU with stopping & checkpoint + Adamax + 5 hidden layers | 0.51 | 0.73 |
| Sigmoid without stopping & checkpoint | 0.51 | 0.73 |
| Sigmoid with stopping & checkpoint + adam | 0.49 | 0.78 |
| Tanh without stopping & checkpoint | 0.63 | 0.60 |
| Tanh with stopping & checkpoint +adam | 0.47 | 0.75 |

## Regression Lift chart

# Task Division

## Chandini Nagendra:

* Report

## Siddharth Chittora

* Report

Discussed together on how to improve the model and came up with the solution discussed in the additional features section.

# Project Reflection

# Additional Features

## Regression Lift chart

# References

[1] Md Moin Uddin Chowdhury and *et. al.* “A Few-shot Deep Learning Approach for Improved Intrusion Detection”, IEEE UEMCOM 2017, October 2017