2023-24 STOCK PRICE PREDICTION USING LSTM

Names of students

Giri Kankatharan(gk304@kent.ac.uk)

Steven Li(sl746@kent.ac.uk)

Rishabh Soni(rs898@kent.ac.uk)

Oliver Pulley(ocp3@kent.ac.uk)

Supervisor

Frank Wang (F.Z.Wang@kent.ac.uk)

Project Description

A stock price prediction application called "Deep Learning Stocks (DLS), which primarily allows users to see the performance of various stocks by comparing algorithmic predicted prices to actual prices of stocks by utilising the Plotly graphing library for visual representation. The project utilises historical data from yahoo finance through its attached API, along with Long Short-Term Memory (LSTM) network. LSTM network is a type of recurrent neural network that is best suited for sequential data learning and make predictions based on the data. The main parts of this project are training a model to predict prices as well as testing and evaluating the model, after which the predictions are visualised through line graphs. Our project also features chat box for users learn about the factors that affected stock prices for a particular time-period, however the chat box can answer any questions related to the companies or stock tickers. Moreover, the project illustrates a visual representation of historical volatility of stocks and a training loss over time for algorithmic predictions.

Results

The main purpose of our project is to apply the LSTM algorithm to time series stock data to predict a direction a stock will move, providing a foundation for others to improve the model and use it to predict future prices. The stock price prediction depends on the stock symbol such as "TSLA" or "APPL" and the period provided by the user. As planned, we gathered data from yahoo finance, pre-processed the data to remove inconsistencies, split the data into training and testing data, created sequences of training data, built the LSTM model, trained the model and finally made predictions on our test data. Our web application also allows users to view/download the visualisation of the results according to the given stock symbol, period, epoch quantity, batch size and sequence length by the user along with background of each company. Moreover, the project illustrates a visual representation of historical volatility of stocks and a training loss over time for algorithmic predictions. Additionally, the interface incorporates a real-time stock information feed and an OpenAI powered chat box called "Analyst Companion" for users to make enquires related to stock prices.