Lawrence Technological University

Maths and Computer Science Department

1813_MCS7033_Collaborative Research Proj 2

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Analysis of the Effect of News Headlines on the Stock Market

Abstract:

The ready availability of data today enables investors of all levels of expertise to make better investment decisions. However, data is siloed and the challenge is determining which data is relevant, then ingesting and integrating the data into a usable format. The question is, can we use current news content to predict relative stock price performance? This research demonstrates that the prediction of percentage stock returns is improved by the inclusion of news sentiment as a feature for predictive model training. The results will be shown for both Apple and Microsoft stock using trending news articles. Six predictive models will be built for comparative purposes.

Research Problem:

There are fast changes in the stock market. It's tough to predict what will happen to a specific company's stock or the general stock market. When the stock market trends can be predicted for the day itself or the next day, a substantial sum of money can be saved. Seeing a link between news headlines and the trend in the stock market is not unusual. If a business receives adverse press, it is understandable that as a result of this negative news, the stocks of this specific business will go down and vice versa. It may be feasible to predict the stock market trend in general or that of a specific business by evaluating news headlines.

Research Question:

To find the impact of news headlines in predicting the share market

Aim:

Accurately forecast the future stock movement for each of the products to aid better investment decisions.

Objective:

To compare the best statistical models and deep learning algorithms to identify which is the most efficient forecasting model for stock market prediction and does news headlines have any impact on the stock price.

Hypothesis:

The performance of algorithms varies for different products.

Scope:

The goal of this project is to contribute to the development of a stock forecasting tool. This tool will include a diverse set of statistical and machine learning techniques, and its primary objective will be to reliably anticipate the movement of stock for a variety of items on the market.

Methodology:

The study was carried out using the methodology CRISP-DM (Cross-Industry Standard Data Mining Process). This methodology offers a study framework that helps the findings to be better and quicker. The CRISP-DM methodology organises the study into six stages, these stages assist in better comprehending the process and provide a road map for planning and conducting the research.

The phases of the CRISP-DM methodology are as follows:

1. Business Understanding

2. Data Understanding

3. Data Preparation

4. Modelling

5. Evaluation

6. Deployment

Each of the phases of the CRISP-DM model will be approached in detail with respect to the research.

Tools & Technologies:

1. programming languages → Python3, HTML5, CSS
2. Algorithms → LSTM, RandomForest Regressor, Linear Regression.
3. Libraries → Tensorflow, Keras, Pandas, numpy, matplotlib
4. Tools → Pycharm